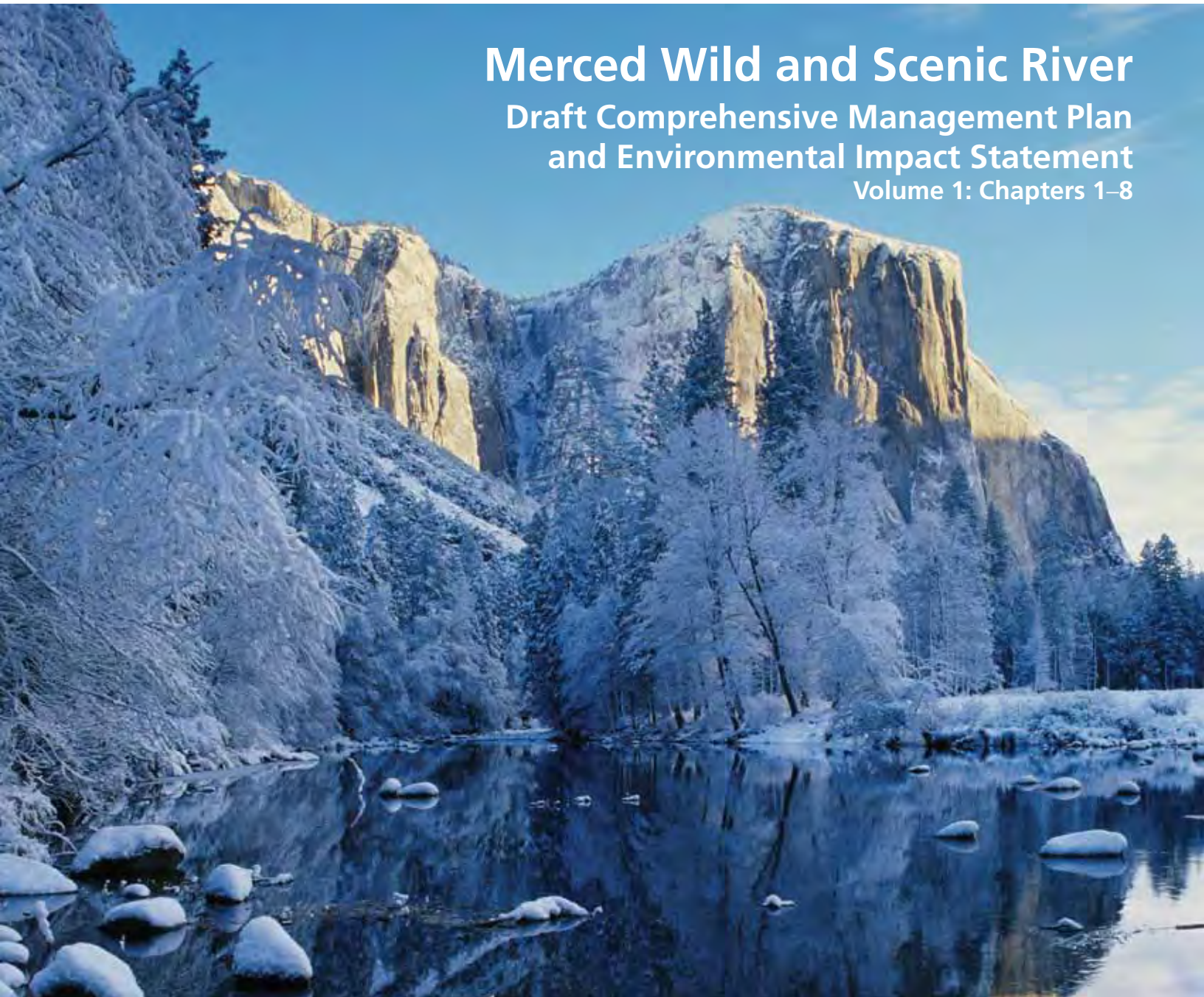




## Merced Wild and Scenic River

### Draft Comprehensive Management Plan and Environmental Impact Statement

Volume 1: Chapters 1–8







## United States Department of the Interior NATIONAL PARK SERVICE

Yosemite National Park  
P.O. Box 577  
Yosemite, California 95389

IN REPLY REFER TO  
H3823 (YOSE-PM)

Dear Friends of Yosemite National Park:

The *Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement* represents a rich collaboration amongst the public, research scientists, park partners and park staff to explore opportunities for the future of Yosemite Valley and the Merced Wild and Scenic River. The alternatives included in the draft plan bring forward the best in science, stewardship, and your ideas to set management direction for the river corridor for the next 20 to 30 years. Alternative 5 (the draft preferred alternative) represents a balance between resource protection and visitor use and access. Yosemite National Park requests your continued active engagement in this draft plan. Your engagement and input are crucial to the future of the Merced River.

The centerpiece of the draft plan is a multi-faceted program to ensure the continual protection and enhancement of the rare, unique, and exemplary qualities of the Merced River. Research studies specific to Yosemite suggest that, overall, the natural river environment is being managed successfully; however, park management aspires to even better things. The draft preferred alternative would restore more than 200 acres of meadow and riparian habitat and outline a long-term program of work to reverse site-specific impacts from past patterns of visitor use. Additionally, a number of facilities subject to flooding and rock fall would be removed and re-designed to reduce the likelihood of future impacts. A robust monitoring program is a prominent feature of all action alternatives. Our commitment to this program acts as an insurance policy for the priceless attributes of the Merced River corridor and allows us to evaluate the success of our restoration goals and adapt our management actions accordingly.

The draft preferred alternative would retain the essence of Yosemite, ensuring that the experiences enjoyed by generations of families are sustained over time. Visitors would continue to have the freedom to access Yosemite Valley by private vehicle while enjoying increased public transit and expanded shuttle bus service. Traffic congestion and crowding would be reduced through organized and efficient parking for day-use visitors. The heart of Yosemite Valley would be reclaimed for visitor use and enjoyment, creating a sense of arrival with the redesign of the primary day-use parking area and the removal of industrial and administrative functions. Recommendations of professional traffic engineers would be implemented to improve circulation, reduce congestion, and provide for a more relaxed visitor experience.

Due to the significance of this plan, Yosemite has scheduled an extended 90-day public comment period. Public meetings will be scheduled in various locations to allow for widespread participation. For a full list of webinars and in-person meetings, visit [www.nps.gov/yose/parkmgmt/mrp\\_meetings.htm](http://www.nps.gov/yose/parkmgmt/mrp_meetings.htm). To obtain a copy of the draft plan or the *Merced River Plan Summary Guide*, visit the park's website at [www.nps.gov/yose/parkmgmt/mrp.htm](http://www.nps.gov/yose/parkmgmt/mrp.htm). For hard copies, send an email request to [yose\\_planning@nps.gov](mailto:yose_planning@nps.gov).

Electronically: To comment, go to the Planning, Environment, and Public Comment (PEPC) website at [http://parkplanning.nps.gov/mrp\\_deis](http://parkplanning.nps.gov/mrp_deis)  
Fax: 209/379-1294  
Mail: Superintendent, Attn: Merced River Plan/DEIS  
P.O. Box 577, Yosemite, CA 95389

Together, we can move forward to set a course for protecting the extraordinary values of the Merced River while ensuring they remain accessible for the use and enjoyment of all generations. We want to assure you that your contribution does make a difference, and we genuinely appreciate your continued involvement in completing this important plan.

Sincerely,

Don L. Neubacher  
Superintendent



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Merced Wild and Scenic River  
Comprehensive Management Plan and Draft Environmental Impact Statement

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# Yosemite National Park

Lead Agency: National Park Service

## ABSTRACT

This *Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement* is intended to guide the management of the Merced Wild and Scenic River within the boundaries of Yosemite National Park for the next 20-plus years. The plan and its draft environmental impact statement, which evaluates potential impacts and the range of alternatives, are integrated in this document and are referred to collectively as the *Merced River Plan / DEIS*.

The *Merced River Plan / DEIS* directs the protection of the river's free-flowing condition, water quality, and the outstandingly remarkable values that make it worthy of designation. The plan will:

- Establish the boundaries and segment classifications (as wild, scenic, or recreational) of the Merced Wild and Scenic River (Chapter 3) and provide a clear process for protection of the river's free-flowing condition in keeping with WSRA Section 7 (Chapter 4).
- Refine descriptions of the river's *outstandingly remarkable values* (ORVs), which are the unique, rare, or exemplary river-related characteristics that make the river eligible for inclusion in the National Wild and Scenic Rivers System and document the conditions of these ORVs, water quality, and free-flowing condition of the river (Chapter 5).
- Identify management objectives for the river, and specific actions and/or programs that will be implemented to achieve the objectives and commit ongoing studies and monitoring to ensure that river values are protected and enhanced over the life of the plan (Chapter 5).
- Establish a user-capacity program that addresses the kinds and amounts of public use that the river corridor can sustain while protecting and enhancing the river's ORVs (Chapters 6 and 7).
- Fulfill the specific direction of the 1987 legislation designating the Merced River as a component of the National Wild and Scenic River System (16 U.S.C. Section 1274 (a)(62)(A)) and make appropriate revisions to the park's 1980 *General Management Plan for Yosemite National Park*.

The *Merced River Plan / DEIS* presents and analyzes six alternatives. Alternative 1 (No Action) would continue current management and trends in the condition of river values. Action Alternatives 2-6 would protect and enhance river values by improving conditions that threaten sensitive meadows, archeological resources, and scenic vistas. The action alternatives vary in the degree of restoration and the amount of visitor use accommodated by the commensurate level of facilities and services necessary to protect river values under each alternative.

There will be a 90-day public comment period for the *Merced River Plan/DEIS*. Comments are due no later than 90 days after the publication of the EPA notice in the *Federal Register*. Please refer to the project website, [www.nps.gov/yose/parkmgmt/mrp.htm](http://www.nps.gov/yose/parkmgmt/mrp.htm), for the exact comment end date. Readers are encouraged to submit comments electronically through the NPS Planning, Environment and Public Comment (PEPC) system at [http://parkplanning.nps.gov/mrp\\_deis](http://parkplanning.nps.gov/mrp_deis).

Written comments regarding this document should be postmarked by the end of the review period and directed to: Superintendent, Yosemite National Park, ATTN: Merced River Plan, P.O. Box 577, Yosemite, CA 95389. You may also fax your comments to 209-379-1294. To request a printed copy or CD of this document (available in limited quantity), please email [yose\\_planning@nps.gov](mailto:yose_planning@nps.gov).



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**Yosemite National Park**

National Park Service  
U.S. Department of the Interior



# **Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement**

**Volume 1: Executive Summary & Chapters 1-8**

**January 2013**





**Photo by Christine White Loberg / NPS**

The Merced Wild and Scenic River, shown flowing by the iconic El Capitan in Yosemite Valley, meanders 81 miles through Yosemite National Park.



**Photo by Erik Skindrud / NPS**

Young campers properly store food at their Yosemite Valley campsite in a bear box to avoid attracting black bears to the campground.



**Photo by Ray Santos / NPS**

Julia Parker, an American Indian interpreter at Yosemite, patches a Mono Indian cooking basket used to prepare acorn mush.



**Photo by Catherine Hilfiker / NPS**

Sarah Stock, a Yosemite ornithologist, demonstrates bird banding techniques to members of the Yosemite Conservation Corps.

# **MERCED WILD AND SCENIC RIVER DRAFT COMPREHENSIVE MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT**

## **Volume 1: Executive Summary and Chapters 1-8**

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# EXECUTIVE SUMMARY

This *Merced Wild and Scenic River Comprehensive Management Plan and Draft Environmental Impact Statement (Merced River Plan/DEIS)* addresses all elements required by the Wild and Scenic Rivers Act (WSRA) for the management of a designated river. It analyzes these elements by following and documenting planning processes required by the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and other legal mandates governing National Park Service (NPS) decision-making.

Readers can gain a summary of proposed actions by reviewing, at a minimum, the following sections:

- ‘Merced River Plan / DEIS’ Document Organization (page 1-4)
- “Alternatives” (Chapter 8)
  - Process Used to Develop the Alternatives (pages 8-1 to 8-7)
  - Actions Common to Alternatives 2-6 (pages 8-53 to 8-102)
  - Alternative 1 (No Action) Overview (pages 8-13 to 8-28)
  - Alternative 2 Overview (pages 8-103 to 8-144)
  - Alternative 3 Overview (pages 8-145 to 8-160)
  - Alternative 4 Overview (pages 8-187 to 8-203)
  - Alternative 5 (Preferred) Overview (pages 8-231 to 8-246)
  - Alternative 6 Overview (pages 8-273 to 8-288)
  - Summary Comparison Table (pages 8-330 to 8-331)

Readers who wish to review the plan in more depth will find more decision-making details here:

- Goals of the Merced River Plan (Chapter 1: page 1-3)
- Identification of Planning Issues: Public and Internal Scoping (Chapter 2: pages 2-13 to 2-18)
- Key Concepts for River Management under WSRA (Chapter 5: pages 5-6 to 5-10)
- Part III User Capacity Discussion (Chapter 6: pages 6-12 to 6-43)

## THE MERCED WILD AND SCENIC RIVER

The Merced Wild and Scenic River, designated in 1987, includes 122 miles of the Merced River on the western side of the Sierra Nevada range in California. The NPS manages 81 miles of the Merced Wild and Scenic River through Yosemite National Park, including the headwaters and both the Merced River’s main stem and the South Fork Merced River (Figure ES-1). As the Merced River flows outside Yosemite’s western boundary, the U.S. Forest Service and the Bureau of Land Management manage the next 41 miles of the Merced Wild and Scenic River.

The main stem of the Merced River originates high in the Sierra Nevada on the eastern side of Yosemite in several watersheds: the Lyell Fork, Triple Peak Fork, Merced Peak Fork, and Red Peak Fork. From its headwaters, the main stem of the Merced River flows freely through Yosemite’s Wilderness, a landscape of alpine peaks, glacially carved valleys, and high-elevation meadows. The main stem of the river and several of its

tributaries make a dramatic entry into Yosemite Valley, rushing over towering cliffs in prominent waterfalls. As the river's gradient lessens, it meanders through the rich meadow and riparian habitat of Yosemite Valley. At the west end of Yosemite Valley, the Merced River canyon narrows, and the river becomes a cascade of continuous rapids through the Merced Gorge. The gradient changes abruptly at the park boundary, where the river continues through the El Portal Administrative Site on its journey through the Sierra Nevada foothills to the Central Valley of California.

**Figure ES-1: Merced Wild and Scenic River and Vicinity**



The South Fork Merced River originates high in the Sierra Nevada on the eastern side of Yosemite National Park, draining the southwestern slopes of Triple Divide Peak and the west facing slopes of Gale Peak and Sing Peak. From its headwaters, the South Fork Merced River flows southwest through the Yosemite Wilderness (south of the Clark Range) and eventually through the community of Wawona. At the western park boundary, the South Fork flows through the Sierra National Forest to the confluence of the main stem of the Merced River west of El Portal.

The river has been central to a dynamic natural and cultural landscape for tens of thousands of years, and it continues to shape the landscape today. Ecological processes between the river and its floodplain support a wide elevational range of riparian and meadow communities providing habitat for a rich diversity of plants and wildlife. The river's cultural heritage includes American Indian cultural traditions associated with the river that continue to the present day, along with the history associated with one of the nation's first

national parks. Today the Merced River attracts millions of Yosemite visitors who enjoy opportunities for recreation, education, reflection, and inspiration in the sublime beauty of the river corridor.

## PURPOSE AND NEED FOR THE ‘MERCED RIVER PLAN /DEIS’

The NPS is considering what long-term, comprehensive guidance will best protect and enhance the 81 miles of the Merced Wild and Scenic River within Yosemite. WSRA requires comprehensive planning for Wild and Scenic Rivers to provide for the protection of the river’s free-flowing condition, water quality, and the outstandingly remarkable values that make it worthy of designation. In accordance with WSRA “the plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act” (WSRA Section 3(d)). In addition, this plan must also fulfill the specific direction of the 1987 legislation designating the Merced River as a component of the National Wild and Scenic Rivers System.

Specifically, the purpose of the plan, as defined by WSRA and its implementing guidance is to:

- Establish the boundaries and segment classifications (as wild, scenic, or recreational) of the Merced Wild and Scenic River (see Chapter 3).
- Provide a clear process for protection of the river’s free-flowing condition in keeping with WSRA Section 7 (see Chapter 4).
- Refine descriptions of the river’s *outstandingly remarkable values* (ORVs), which are the unique, rare, or exemplary river-related characteristics that make the river eligible for inclusion in the National Wild and Scenic Rivers System (see Chapter 5).
- Document the conditions of river values, including water quality, free-flowing condition, and outstandingly remarkable values (ORVs) (see Chapter 5).
- Identify management objectives for the river, and specific actions and/or programs that will be implemented to achieve the objectives (see Chapter 5).
- Commit to a program of ongoing studies and monitoring to ensure that river values are protected and enhanced over the life of the plan (see Chapter 5).
- Establish a user-capacity program that addresses the kinds and amounts of public use that the river corridor can sustain while protecting and enhancing the river’s outstandingly remarkable values (see Chapters 6 and 7).

This is the third management plan prepared for the Merced Wild and Scenic River within Yosemite. In 2009, the NPS settled a long-running lawsuit challenging the adequacy of the two prior versions of the Merced River Plan (prepared in 2000 and 2005). The need for the *Merced River Plan/DEIS* also derives from the *2009 Settlement Agreement*, under which the NPS agreed to complete a new comprehensive management plan for the Merced Wild and Scenic River. Chapter 2 of this *Merced River Plan/DEIS* summarizes the history of the lawsuit and the relevance of the settlement agreement to the development of this comprehensive river management plan.

## Outstandingly Remarkable River Values

As noted above, WSRA requires comprehensive planning for the Merced Wild and Scenic River to provide for the protection of the river’s free-flowing condition, water quality, and the outstandingly remarkable



values (ORVs) that make the river worthy of designation. The ORVs of the Merced River are defined in this plan as follows:

### ***Biological Values***

1. The Merced River sustains numerous small meadows and riparian habitat with high biological integrity.
2. The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada.
3. Sierra sweet bay (*Myrica hartwegii*) is a rare plant found on river banks of the South Fork Merced River.

### ***Geologic/Hydrologic Values***

4. The upper Merced River canyon is a textbook example of a glacially carved canyon.
5. The “Giant Staircase,” which includes Vernal and Nevada Falls, is one of the finest examples in the western United States of stair-step river morphology.
6. The Merced River from Happy Isles to the west end of Yosemite Valley provides an outstanding example of a rare, mid-elevation alluvial river.
7. The boulder bar in El Portal was created by changing river gradients, glacial history, and powerful floods. These elements have resulted in accumulation of extraordinarily large boulders, which are rare in such deposits.

### ***Cultural Values***

8. Yosemite Valley American Indian ethnographic resources include a linked landscape of specifically mapped traditional-use plant populations as well as the ongoing traditional cultural practices that reflect the intricate continuing relationship between indigenous peoples of the Yosemite region and the Merced River in Yosemite Valley.
9. The Yosemite Valley Archeological District is an unusually rich and linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement.
10. The Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system.
11. The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region and archeological remains of the Johnny Wilson Ranch, a regionally rare historic-era American Indian Homestead.
12. The South Fork Merced River above Wawona includes regionally rare archeological features representing indigenous settlement and use along the South Fork Merced River at archeological sites with rock ring features.
13. The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including unusually rich evidence of continuous far-reaching traffic and trade. In Segment 7, remains of the U.S. Army Cavalry Camp A. E. Wood document the unique Yosemite legacy of the African-American Buffalo Soldiers and the strategic placement of their camp near the Merced River.

14. The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity.

### ***Scenic Values***

15. Visitors to the Merced River above Nevada Fall experience exemplary views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks.
16. Visitors to Yosemite Valley experience views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls.
17. Through the Merced Gorge, the Merced River drops 2,000 feet over 14 miles, a continuous cascade under exemplary Sierra granite outcrops and domes.
18. The South Fork Merced River below Wawona passes through a vast area of exemplary and wild scenic beauty.

### ***Recreational Values***

19. Visitors to federally designated Wilderness in the corridor engage in a variety of river-related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the experience.
20. Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River.

## **OVERVIEW OF THE PLAN AND ALTERNATIVES**

The *Merced River Plan* focuses on protecting and enhancing river values; therefore, many of the actions that would be taken to address management issues related to those values are common to all the action alternatives. For example, a comprehensive ecological restoration program for river-related meadow and riparian habitat is a central component of the plan that is included in all the action alternatives (Alternatives 2-6). The alternatives presented in Chapter 8 of the *Merced River Plan/DEIS* cover all 81 miles of the river corridor but vary, primarily, in how they will balance the protection of river values with different kinds of visitor use and associated user capacities.

## **Protection and Enhancement of River Values in the Merced River Plan**

### ***Free-Flowing Condition***

The Merced River in Yosemite is free-flowing with few impediments. Under the *Merced River Plan*, the NPS will protect its free-flowing condition by implementing a process under Section 7 of WSRA to ensure that no potential water resource project within the bed and banks of the river would have a direct and adverse effect on this river value.

At the time of the river's designation (1987), the natural flow regime had been altered in several locations by bridges, abandoned infrastructure in the river channel, riprap, water withdrawals for domestic use, and altered riverbank and channel conditions. These management considerations remain. The *Merced River Plan/DEIS* evaluates a range of options to address these issues, including removing large stretches of riprap,

removing or retaining bridges (many of which are historic), removing abandoned infrastructure from the bed and banks of the river, and using bio-engineering techniques to stabilize riverbanks and increase channel complexity.

### ***Water Quality***

The Merced River has exceptionally high water quality. All the measured indicators are within the NPS standards, which are considerably more protective than other federal or state standards. Although water quality is protected, a few risks are present within the river corridor, including surface water run-off in developed areas, potential hazards related to dump stations, septic tanks and leach fields, and accelerated erosion and potential sediment loading in the river. The *Merced River Plan/DEIS* addresses risks to water quality with a suite of actions to re-route stock trails that could affect water quality, move parking areas away from the river and/or construct stormwater run-off infrastructure; develop a wastewater collection system for Wawona Campground, and relocate dump stations.

An ongoing monitoring program will continue to test for nutrients, *E. coli*, and petroleum hydrocarbons to ensure that the exceptional baseline water quality is sustained over time. Decreasing water quality for any of these indicators will initiate more frequent sampling trigger studies to identify the source of the concern. Depending on the source, appropriate action will be taken to address the concern prior to an adverse effect. If the concern is related to visitor use, the use will be managed as needed to protect this river value.

### ***Biological Values***

#### **High-elevation Meadows and Riparian Habitat**

In 2010 and 2011, park staff evaluated the condition of high-elevation meadows and riparian areas and found high ecological integrity, with the exception of some site-specific impacts in subalpine meadows. Conditions at the time of the river's designation in 1987 were likely similar. Based on these recent assessments, NPS management considerations for specific subalpine meadow areas include high levels of bare soil, heavily grazed vegetation, evidence of stock-related disturbance, informal trails (visitor-created trails that are not directly managed by park staff), and extirpated or declining meadow and riparian wildlife species. In response, the *Merced River Plan/DEIS* evaluates actions to remove informal trails throughout the high-elevation meadow and riparian areas and options for stock use management that range from elimination of administrative pack stock grazing in certain areas to establishing grazing capacities. The alternatives also continue NPS policy to remove non-native species and re-introduce extirpated or declining wildlife species, as opportunities arise.

An ongoing program of monitoring and study will continue to be implemented to ensure that the high-elevation meadow and riparian habitat is returned to good condition and remains in good condition over the life of the plan. A suite of three indicators will be used to track the health and potential for impact on this complex river value. An important part of the monitoring program will be management triggers that identify any decline from "good" condition under any of the three indicators well before an adverse effect occurs. Any of these triggers would require additional action to protect the high-elevation meadow and riparian habitat.

### **Mid-elevation Meadows and Riparian Habitat in Yosemite Valley**

At the time of the river's designation in 1987, the impacts on meadow and riparian areas in Yosemite Valley included an altered hydrologic regime, loss of meadow extent, stresses on meadows caused by human use, accelerated bank erosion, denuded meadow and riparian vegetation in high-use areas, and poorly designed riprap revetment. While the NPS has taken action since designation to address several problem areas, many of these issues remain. Current NPS management concerns for this value include the proliferation of informal trails that lead to meadow fragmentation, conifer encroachment into meadows, impacts of non-native species, human-caused alterations to meadow topography, and formal trails that pass through sensitive meadow habitat.

The *Merced River Plan/DEIS* addresses these management concerns through a comprehensive program of ecological restoration and management of visitor use and development. Ecological restoration will include actions to decompact trampled soils and re-vegetate impacted areas, restore natural meadow topography, and re-vegetate riverbanks with native riparian shrubs and trees. Management of visitor use and development will include establishing a riparian buffer that precludes new development within 150 feet of the ordinary high-water mark. The plan will also remove and/or relocate some existing infrastructure, such as campsites in close proximity to the river, from a riparian buffer zone.

Additional actions will include removal of informal parking in meadow and riparian areas and removal of approximately six miles of informal trails through meadows; re-direction of visitor use to stable and resilient river access points; use of boardwalks or hardened surfaces to allow access to sensitive meadow areas; and increased visitor education. These actions are expected to enhance the meadow and riparian habitat and allow for long-term management in a condition equal to or better than the management standards. (Additional management of visitor use and development to further enhance this value is explored through alternative proposals to guide use to resilient areas or relocate development; these actions are explored in the range of alternatives in Chapter 8).

### **The Sierra Sweet Bay (*Myrica hartwegii*)**

At the time of the river's designation in 1987, botanists considered the Sierra sweet bay to be rare in Yosemite, but not threatened by local impacts. Based on 2010 surveys, the Sierra sweet bay population in Yosemite National Park is in good condition. The Merced River Plan includes a program to monitor the condition of the Sierra sweet bay population, and actions to protect this rare species if conditions decline.

## ***Geologic/Hydrologic Values***

### **Glacially carved Upper Merced River Canyon**

The glacially carved river canyon is considered impervious to human activity. Natural processes will continue to shape the landscape and the associated river value. No action other than continued protection under WSRA is proposed by the plan.

### **“Giant Staircase,” including Vernal Fall and Nevada Fall**

Stairstep river morphology is considered impervious to human activity. Natural processes will continue to shape the landscape and the associated river value. No action other than continued protection under WSRA is proposed by the plan.

### **Rare, Mid-elevation Alluvial River**

This river value integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities. Its condition is closely related to the free-flowing condition of the river and the mid-elevation meadows and riparian habitat river value discussed above. In addition to the issues identified for these river values, management considerations for this value include riverbank erosion in localized areas, lack of natural levels of large wood in the river system, altered surface and groundwater flow, and floodplain connectivity.

In addition to the actions to protect and enhance the free-flowing condition of the river and the mid-elevation meadows and riparian habitat river values listed above, the *Merced River Plan/DEIS* includes actions to improve fundamental alluvial processes in Yosemite Valley, including leaving large wood in the river channel that does not compromise visitor safety or infrastructure; placing large wood in the river to enhance channel complexity and mitigate scouring caused by bridges; placing log jams at specific locations in the river channel; and incorporating large wood into riverbanks to provide natural structure and increase habitat quality.

### **Boulder Bar in El Portal**

The large boulder bar at the east end of El Portal is considered impervious to human activity. Natural processes will continue to shape the landscape and the associated river value. No action other than continued protection under WSRA is proposed by the plan.

## ***Cultural Values***

### **Yosemite Valley American Indian Ethnographic Resources**

The discontinuation of traditionally associated American Indian practices, such as seasonal burning, selective pruning, tilling, timely harvesting, and propagation, had impacted ethnographic resources when the river was designated in 1987. Historic activities had also altered traditionally used meadow and oak habitat. In addition, by the time of designation, the introduction of non-native plant species had encroached on populations of traditional use plants in Yosemite Valley. All of these changes had likely led to alterations in the abundance and integrity of ethnographic resources, changes which persist today.

Since the river's designation in 1987, the NPS has begun restoration of sensitive resource areas to conditions resembling those found prior to intensive historic-era settlement. However, recent California black oak studies in Yosemite Valley indicate that ecological restoration action to restore a healthier sapling to non-sapling ratio is needed to promote a healthy black oak population in the Valley.

The current NPS mission encourages and seeks to facilitate ongoing cultural connections between traditionally associated American Indian communities and ancestral park lands and resources. Management considerations remain regarding the impact of non-native species, altered meadow hydrology, altered or denuded riparian vegetation, park operations, crowding, and visitor use on traditional-use plant populations and access to ethnographic resources. In response, the *Merced River Plan/DEIS* will continue to coordinate with traditionally associated American Indian tribes and groups and traditional practitioners in the development and implementation of park programs related to law enforcement, fire management, interpretation, ecological restoration, and facilities management. In addition, the ecological restoration program proposed in the *Merced River Plan/DEIS* will address existing impacts on traditionally used plant populations and will protect these populations over the life of the plan.



## **Yosemite Valley Archeological District**

At the time of the river's designation, the district retained integrity despite impacts from facility and administrative use, visitor use, and ecological processes that can impact archeological sites. The majority of archeological sites in Yosemite Valley still retain a relatively high degree of integrity; however, many have been disturbed by human activity or natural processes. Recent assessments found 47% of sites are rated in "good" condition, an additional 33% are in "fair" condition, and 18% are in "poor" condition. Disturbance severities range from 39% of sites with low disturbance, to 33% of sites with moderate disturbance severity, to 25% of sites with severe disturbances. Impacts on these sites include soil compaction, vegetation damage, movement of artifacts, feature disturbance, and vandalism. Some of these impacts are caused by formal and informal trails, stock impacts, parking, rock climbing and other visitor-use activities, such as camping.

Under the *Merced River Plan/DEIS*, sites will continue to be monitored. The potential for impacts will be greatly reduced by actions to manage visitor-use levels, divert foot traffic and stock use away from sites, remove informal trails, formalize river and meadow access locations, and mitigate ecological restoration practices by using non-invasive techniques wherever possible. Many of the actions related to the plan's ecological restoration program in Yosemite Valley, such as removing or delineating roadside parking, will also help protect archeological sites by diverting foot traffic away from sites and into less sensitive areas. The plan also proposes developing site-specific treatment actions through site management plans, where necessary, to avoid resource loss through park actions (such as development, repair, and maintenance of facilities and underground utilities to support visitor use). Any future downward trend in site conditions associated with human use will trigger a required management response to counteract or minimize the effect before an adverse impact occurs.

## **Yosemite Valley Historic Resources**

Recent assessments indicate that a number of building and structures that are an integral part of this river value, including National Historic Landmarks, are currently in "fair" condition. Residence 1, also known as the Superintendent's House, is in "poor" condition. Under *The Merced River Plan/DEIS*, preservation maintenance and/or repairs would occur sufficient to return these buildings and structures to "good" condition and to arrest ongoing deterioration of other elements. Specific actions called for in the plan would be further developed through consultation with the California State Historic Preservation Office and reflected in detail in the *Merced River Plan/DEIS* programmatic agreement. If future monitoring under the NPS List of Classified Structures assessment program detects deterioration or damage, repairs will be undertaken to correct the deficiency while the structure is still in an overall good condition.

In addition, the plan would continue the existing program of historic building and structures maintenance and repair in Yosemite Valley, employ design guidelines for new development or re-development, periodically assess and update documentation, and maintain the essential qualities of individual historic developed areas in Yosemite Valley.

## **El Portal Archeological District**

Sites within the El Portal Archeological District have been impacted by from historic development, more recent NPS administrative uses, and visitor use. The condition of the district has not changed significantly from the time of the river's designation in 1987. NPS management considerations for this river value include abandoned infrastructure located on an exceptional and extremely sensitive site that is highly valued by traditionally associated American Indians. In addition, informal trails, gravel roads, and visitor use are

contributing to site disturbance. The *Merced River Plan/DEIS* will protect these sites by removing informal trails, non-essential gravel roads, and abandoned infrastructure. The aforementioned site with high cultural significance for traditionally associated American Indians will be protected from any further development. A plan of action for addressing the abandoned infrastructure on that particular site will be developed in consultation with traditionally associated American Indian tribes and groups.

### **Archeological Sites in High Elevations along the South Fork Merced River**

Three regionally rare prehistoric archeological sites on the South Fork Merced River are fragile and highly susceptible to human alteration from visitor use. Documentation of these sites is incomplete. Since the time of the river's designation in 1987, a 1992 survey documented damage where visitors built a campfire in one site. Site visits in 2000 and 2002 found that two of the sites were in "good" and "fair" condition. In 2005, a site visit noted disturbance by campers; this is likely the same site surveyed in 1992. Under the *Merced River Plan/DEIS*, the NPS will complete documentation for these sites, restrict Wilderness camping in the area, remove informal trails near the sites, and increase education and outreach to Wilderness travelers.

### **Wawona Archeological District**

A recent condition assessment of the total 59 sites in the Wawona Archeological District within the Merced River corridor found that 33% (19 sites) are in "good" condition, with an additional 38% (23 sites) in "fair" condition, and 19% (11 sites) in "poor" condition. Four sites could not be relocated during an attempted field visit, and two sites with unknown conditions were not visited as part of the project because they were outside the project area. Impacts seen at archeological sites in the district fall into largely the same categories as those noted in the Yosemite Valley and El Portal archeological districts: administrative/facilities-related impacts such as campground and infrastructure maintenance, visitor-use impacts (including general trampling, artifact collection, and creation of informal trails), and natural impacts, such as flooding and erosion.

Under the *Merced River Plan/DEIS*, the NPS will address these issues by increasing monitoring frequency at affected sites, removing seven campsites from Wawona Campground, removing informal trails and fire rings in proximity to a site, and revising the Wawona Archeological District's National Register nomination to reflect changes in the district since its nomination to the register in 1979.

### **Wawona Historic Resources**

Two historic resources listed on the National Register are included within this value: the Wawona Covered Bridge and The Wawona Hotel National Historic Landmark. Currently, the Wawona Covered Bridge is considered to be in "good" condition. A recent condition assessment of the Wawona Hotel Complex indicates that the hotel complex continues to retain a high degree of historical integrity. There are a total of eight buildings and structures at the hotel, seven of which are assessed as in "good" condition, with some related contributing elements like wood siding and trim in "poor" condition. One building, Clark Cottage, was found to be in "fair" condition. Under *The Merced River Plan/DEIS*, preservation maintenance and/or repairs would occur sufficient to maintain the condition of buildings and structures currently in "good" condition, return the Clark Cottage to "good" condition, and to arrest any ongoing deterioration of other elements. If future monitoring under the NPS List of Classified Structures assessment program detects deterioration or damage, repairs will be undertaken to correct the deficiency while the building or structure is still in an overall "good" condition.

## ***Scenic Values***

### **Scenic Views in Wilderness**

Scenic views along the Merced River in Wilderness are largely unaffected by human activity. Views from the river and along trails include very few human-made features, most of which are clustered at specific locations. Scenic vistas can sometimes be obscured by regional air pollution. In addition, local wild and prescribed fires sometimes limit the visual range from higher elevations and vistas or views located within the river corridor.

At Merced Lake High Sierra Camp, which is located outside of designated Wilderness, there are rustic structures, trails, footbridges, utility buildings and tents visible from Wilderness. In the *Merced River Plan/DEIS*, the NPS is considering options for removing the High Sierra Camp, or keeping the camp and replacing tent fabric using colors that blend with the landscape (the options vary by alternative). In other locations specific to Wilderness, no further development or resource extraction can occur. To prevent management issues from re-developing, the *Merced River Plan/DEIS* monitoring program will subject any proposed structures to a contrast analysis, complemented by periodic monitoring, and a suite of actions to be taken should new scenic issues be identified. In addition, the NPS will continue to participate in regional efforts to monitor air quality throughout the park.

### **Iconic Scenic Views in Yosemite Valley**

Natural scenery in Yosemite Valley was key to the creation of Yosemite National Park. Much of the infrastructure in Yosemite Valley was developed to take advantage of abundant views of spectacular waterfalls, towering granite walls, and the interface of river, rock, meadow, and forested valley floor. Views from the river and designated vista points have retained high aesthetic value. Management considerations for scenic values in Yosemite Valley revolve around (1) visual intrusions associated with human-built structures, including parking, roads and traffic in meadows and the presence of certain facilities, (2) vegetation growth at scenic viewpoints, and (3) riverbank erosion, informal trails, and denuded riparian vegetation that affect views of the river or river-dependent resources.

The *Merced River Plan/DEIS* considers the presence of existing structures, major facilities, and services provided for visitors in the context of WSRA requirements. Under all alternatives, several structures and facilities will be removed, such as recreational facilities — such as pools, bike rentals, and the ice rink — abandoned bridge footings, and large stretches of riprap. All action alternatives propose a 150-foot riparian buffer to insulate the river from new development and protect views from the bed and banks. The ecological restoration program, included in all action alternatives, would also address disturbance in meadows, along riparian zones, and on riverbanks. The plan alternatives vary when addressing new development or relocation / removal of existing lodging, campsites, parking, and housing.

In addition, the *Merced River Plan/DEIS* will implement recommendations from the Scenic Vista Management Plan for Yosemite National Park Environmental Assessment to manage 47 vista points in the river corridor, primarily through mechanical thinning of conifers that obscure scenic views.

### **Scenic Views in the Merced River Gorge**

There have been some changes to scenic views in the Merced River Gorge, along El Portal Road, since the river's designation in 1987. The El Portal Road was severely damaged by the 1997 flood and was re-built and updated to meet contemporary safety standards. The road's rock walls and barriers were re-built in keeping

with historic character. The scenic quality of the Big Oak Flat Road/El Portal Road junction improved when the Cascades Diversion Dam and associated features were removed from the Gorge. The historic powerhouse and the Arch Rock entrance station/comfort station remain in place. Natural processes will continue to shape the landscape and the scenic river value. No action related to scenic values in this area, other than monitoring and continued protection under WSRA, is proposed by the *Merced River Plan/DEIS*.

### **Scenic Wilderness Views along the South Fork Merced River**

Scenic views in wild segments along the South Fork Merced River, including portions of the river corridor in designated Wilderness, are unaffected by human activity. The NPS will continue to participate in regional efforts to monitor air quality throughout the park.

### ***Recreational Values***

#### **Wilderness Recreation above Nevada Fall**

At the time of designation, the wild segment of the Merced River above Nevada Fall offered outstanding opportunities for river-related recreation characterized by self-reliance and solitude, and those opportunities continue today. The most common visitor activities within the corridor are hiking, backpacking, stock use, and lodging at the Merced Lake High Sierra Camp. Since the 1970s, an overnight zone capacity and trailhead quota system has helped protect this river value, particularly in more remote portions of the segment. Current management considerations include crowding at designated backpacker camping areas and high encounter rates on trails, particularly on busy weekends, although all conditions remain above the management standards for this ORV that will be implemented under the *Merced River Plan/DEIS*. The plan considers a variety of actions that could be taken to reduce zone capacities and trailhead quotas, expand designated camping areas, or disperse overnight use more broadly throughout the segment to enhance this recreational value. Regardless of which alternative is selected, the NPS will continue to monitor visitor encounter rates and take additional action in the future if necessary to protect the opportunities for primitive and unconfined recreation, self-reliance, and solitude that characterize this recreational value.

#### **River-related Recreation in Yosemite Valley**

At the time of designation, visitors to Yosemite Valley were participating in a wide diversity of activities, including sightseeing, scenic driving, day hiking, wildlife viewing, picnicking, floating, creative arts, camping, lodging, bicycling, nature study, rock climbing, and ranger-led programs. All of these activities are ongoing, and most have been determined to be river-related and contributing to this ORV (notable exceptions being lodging and many of the commercial services in the Valley).

A 1992 study near the time of designation found that the large majority of visitors rated their experiences as very good or better. However, a significant number also expressed that there was too much vehicle traffic and too many people in Yosemite Valley. The most recent survey of visitor satisfaction, conducted in 2005, found that more than half of all visitors were experiencing crowding.

This management concern will be addressed in the *Merced River Plan/DEIS* by implementing a user-capacity program that either reduces visitor use or increases the facilities necessary to support use without adversely affecting either resource values or the visitor experience. A major component of all the plan alternatives is decreasing traffic congestion through roadway, parking, and transit improvements; reducing congestion at

popular attractions by dispersing use to appropriately designed destinations; and removing unnecessary services and facilities, including many of the commercial services currently provided in the Valley. The alternatives explore different ways of balancing day and overnight opportunities, both of which are experiencing demand that exceeds the capacity of the current facilities. In all alternatives, the overnight capacity will be controlled through camping and lodging availability, and the day capacity will be controlled through the availability of day parking.

The effectiveness of using the day parking supply in Yosemite Valley to manage day-use capacity will be monitored through an indicator that compares the number of vehicles actually parking in Yosemite Valley with the supply of designated parking provided under the plan. Additional management actions to identify issues and enforce the designated user capacity will be triggered by the exceedance of standards developed for this indicator.

## Overview of the Alternatives

Six alternatives (a No Action alternative plus five action alternatives) under consideration in the *Merced River Plan/Draft EIS* involve primarily a reasonable range of variations in visitor use and user capacity. A table comparing the user capacities of the alternatives is included at the end of this section.

### *Alternative 1: No Action*

Alternative 1, also known as the “No Action Alternative,” is required by NEPA implementing regulations and serves as a baseline from which to compare the action alternatives. Alternative 1 represents existing conditions in 2011, when the NPS completed a series of research studies to assess the conditions of river values in the Merced River corridor. This alternative assumes that current trends in the conditions of natural and cultural resources and visitor experiences would continue, consistent with the management activities that are ongoing under currently approved plans. Future actions that would require additional planning and environmental compliance could still occur, independent of the *Merced River Plan/DEIS*, but they are not considered part of the No Action Alternative for the purposes of conducting environmental compliance for the *Merced River Plan/DEIS*.

### Summary of Current Actions and Issues Affecting River Values

Under Alternative 1 (No Action), the NPS would not adopt a comprehensive management plan to protect and enhance river values in the corridor. The two prior versions of the river plan would not be in effect because the courts determined that prior versions of the plan were invalid. The river corridor would be ¼ mile on either side of the ordinary high-water mark because WSRA provides for these default boundaries in the absence of agency designated boundaries. The segment classifications would be the same as those in the 1982 National Rivers Inventory. There would no Section 7 Determination Process.

The ORVs would continue to be protected by ongoing management programs although management considerations and concerns would continue, as discussed in Chapter 5. In addition, ecological restoration actions would be limited to those that would only require a Categorical Exclusion in compliance with NEPA, and those identified in the *2009 Settlement Agreement*. The NPS would also continue invasive species control where such plants are present as well as conifer removal from some meadows.

Although the ecological restoration possible without a comprehensive plan would mitigate some impacts to river values, management considerations and concerns associated with the current management of the river corridor (which the *Merced River Plan/DEIS* is intended to address) would generally continue under the No Action Alternative. These issues are not repeated here (although they are reiterated from Chapter 5 in the No Action Alternative in Chapter 8).

### **Summary of Current User Capacities, Land Use, and Facilities Management**

Under the No Action Alternative, existing user-capacity management actions would continue. These include the use of the wilderness permit system for overnight use of the backcountry and the reservations systems for camping and lodging accommodations. Day use would remain unlimited. Traffic congestion would be managed by staff directing traffic, maximizing parking efficiency, and diverting inbound traffic away from Yosemite Valley if no parking was available during peak use days. Pilot transit programs would continue to provide limited additional service to destinations within the river corridor, including Yosemite Valley. There would be no established limit to the number of visitors or vehicles that would be allowed within the corridor. All existing services and facilities would be retained.

Visitors would continue to have unmanaged access to many locations and services. However, during peak hours of the busiest peak season days, traffic congestion and crowding at popular attractions would continue to significantly affect the quality of the experience for many visitors.

### ***Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

The guiding principles of Alternative 2 would include maximizing the restoration of the 100-year floodplain by removing infrastructure not essential to resource-related recreation, and creating a more self-reliant visitor experience, where fewer commercial services would be available. Visitor-use levels would be managed to allow for visitor experiences free of crowding or congestion.

Management actions in Alternative 2 would:

- Restore 347 acres of meadow and riparian habitat.
- Slightly reduce the available campsites in all river segments (-8%) and in Yosemite Valley (-3%).
- Significantly reduce the available lodging in all river segments (-43%) and in Yosemite Valley (-46%).
- Reduce day-use parking spaces in Yosemite Valley (-23%).
- Reduce commercial services.
- Make significant changes to traffic-circulation patterns in Yosemite Valley to accommodate ecological restoration goals and reduce traffic congestion.
- Accommodate approximately 13,900 visitors per day in East Yosemite Valley
- Continue to manage overnight use through the wilderness permit system and a reservation system for lodging and camping
- Manage day-use capacity for East Yosemite Valley through a parking permit system required during peak season.

### ***Alternative 3: Dispersed Visitor Experience and Extensive Riverbank Restoration***

The guiding principles of Alternative 3 would include restoration of large portions of the floodplain and the riparian area within 150 feet of the river. This alternative would accommodate much lower maximum visitor-use levels than today, and offer fewer commercial services and facilities. Visitor-use levels would be managed to allow for dispersed visitor experiences free of crowding or congestion.

Management actions in Alternative 3 would:

- Restore 302 acres of meadow and riparian habitat.
- Slightly reduce the campsite inventory in all river segments (-3%) and slightly increase campsite inventory in Yosemite Valley (+2%).
- Significantly reduce the lodging inventory in all river segments(-37%) and in Yosemite Valley (-40%).
- Significantly reduce day-use parking for Yosemite Valley (-32%).
- Reduce commercial services.
- Make significant changes to the traffic circulation pattern in Yosemite Valley to accommodate ecological restoration goals and reduce traffic congestion.
- Accommodate approximately 13,200 visitors per day in East Yosemite Valley.
- Continue to manage overnight use through wilderness quotas, reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through permits and a reservation system required during peak season.

### ***Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration***

The guiding principles of Alternative 4 include restoration of portions of the floodplain and the riparian area within 150 feet of the river. This alternative focuses on providing only those commercial services and facilities that facilitate resource-based visitor experiences. It accommodates lower maximum visitor use levels than today, with large increases in overnight camping capacity, and moderate decrease in the overnight lodging capacity.

Management actions in Alternative 4 would:

- Restore 223 acres of meadow and riparian habitat.
- Significantly increase the campsite inventory in all river segments (+37%) and in Yosemite Valley (+50%).
- Reduce the lodging inventory in all river segments (-20%) and in Yosemite Valley (-20%).
- Reduce day-use parking for Yosemite Valley (-12%).
- Reduce commercial services.
- Make targeted changes to the traffic circulation pattern in Yosemite Valley to accommodate ecological restoration goals and reduce traffic congestion.
- Accommodate approximately 17,000 visitors per day in East Yosemite Valley.
- Continue to manage overnight use capacity through wilderness permits, and reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through permits and a reservation system required during peak season.

***Alternative 5 (Preferred): Enhanced Visitor Experience and Essential Riverbank Restoration***

The guiding principles of Alternative 5 would include significant restoration within 100 feet of the river and in meadow and riparian areas, maintaining daily visitation in Yosemite Valley to accommodate peak levels similar to those observed in recent years, reducing unnecessary facilities and services, and converting facilities from administrative use to public use where feasible.

Management actions in Alternative 5 would:

- Restore 203 acres of meadow and riparian habitat.
- Significantly increase the campsite inventory in all river segments (+28%) and in Yosemite Valley (+37%).
- Minimally increase the lodging inventory in all river segments (less than 1%) and in Yosemite Valley (+2%).
- Increase day-use parking spaces in Yosemite Valley (+5%).
- Reduce commercial services.
- Make significant changes to the traffic circulation pattern to meet ecological restoration goals and reduce traffic congestion through infrastructure improvements.
- Accommodate approximately 19,900 visitors per day in East Yosemite Valley.
- Continue to manage overnight use capacity through wilderness permits and reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through traffic diversions and monitoring.

***Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

The guiding principles of Alternative 6 include limited restoration within 100 feet of the river and in meadow and riparian areas, infrastructure improvements to accommodate growth in peak daily visitation in Yosemite Valley, and expansion of facilities and services to allow for diversified visitor experiences.

Management actions in Alternative 6 would:

- Restore 170 acres of meadow and riparian habitat.
- Significantly increase the campsite inventory in all river segments (+46%) and in Yosemite Valley (+59%).
- Increase the lodging inventory in all river segments (+18%) and in Yosemite Valley (+21%).
- Increase day-use parking for Yosemite Valley (+11%).
- Expand facilities and services to accommodate growth in visitation.
- Reduce traffic congestions and improve traffic circulation through major infrastructure improvements.
- Accommodate approximately 21,800 visitors per day in East Yosemite Valley.
- Continue to manage overnight use capacity through wilderness quotas and reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through traffic diversions and monitoring.

***Summary Comparison of Alternatives***

A summary comparison of actions to protect and enhance river values is shown in Table ES-1. A summary comparison of user capacities under all the alternatives is shown in the Table ES-2.



**TABLE ES-1: SUMMARY OF MAJOR ACTIONS FOR PROTECTING AND ENHANCING RIVER VALUES—COMMON TO ALTERNATIVES 2-6**

	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
<b>Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values</b>					
<b>Corridorwide</b>					
<b>Ecological Restoration Acreage</b>	Common to Alternatives 2-6: 164 acres total (refer to Appendix E for specific locations)				
	347 total acres	302 total acres	223 total acres	203 total acres	170 total acres
<b>Riprap to be Removed</b>	Common to Alternatives 2-6: 5,700 linear feet (refer to Appendix E for specific locations)				
	additional 964 feet of riprap	additional 435 feet of riprap	additional 435 feet of riprap	additional 435 feet of riprap	additional 348 feet of riprap
<b>Segment 1: Wilderness above Nevada Fall</b>					
<b>Riparian Buffer / Floodplain</b>	Remove facilities at Merced Lake High Sierra Camp and restore floodplain.	Remove facilities at Merced Lake High Sierra Camp and restore floodplain.	Remove facilities at Merced Lake High Sierra Camp and restore floodplain.		
<b>Segment 2: Yosemite Valley</b>					
<b>Free Flow / Geologic/ Hydrologic Values</b>	Common to Alternatives 2-6: <ul style="list-style-type: none"> <li>Place large wood into riverbanks and river channel and construct log jams between Clark's and Sentinel bridges to enhance riparian habitat and channel complexity.</li> <li>Remove riverbank riprap.</li> <li>Remove the Happy Isles bridge footings and relocate the Pohono gauging station.</li> </ul>				
	Remove Ahwahnee, Sugar Pine, and Stoneman bridges	Remove Ahwahnee, Sugar Pine, and Stoneman bridges	Remove Ahwahnee and Sugar Pine bridges	Remove Sugar Pine Bridge	

**TABLE ES-1: SUMMARY OF MAJOR ACTIONS FOR PROTECTING AND ENHANCING RIVER VALUES—COMMON TO ALTERNATIVES 2-6**

	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
<b>Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values</b>					
<b>Riparian Buffer / Floodplain</b>	<p>Common to Alternatives 2-6:</p> <ul style="list-style-type: none"> <li>At a minimum, remove existing campsites and associated infrastructure from within 100 feet of the bed and banks of the river.</li> <li>Establish a riparian buffer to prohibit any new development within 150 feet of the bed and banks of the river</li> <li>Move Yosemite Village Day-use Parking Area (Camp 6) north at least 150 feet away from the river.</li> <li>Implement a 50-foot riparian setback from Indian Creek.</li> <li>Direct river access to resilient sandy beaches and sandbars; fence off sensitive riparian areas, and restore native riparian vegetation.</li> </ul>				
	<ul style="list-style-type: none"> <li>Ecologically restore 35.6 acres of the 10-year floodplain at former Upper and Lower River campgrounds.</li> <li>Ecologically restore 25 acres of 100-year floodplain at the North Pines Campground, Backpackers Camp, Yellow Pine Administrative Campground, and portions of Lower Pines Campground.</li> <li>Ecologically restore large portions of Yosemite Lodge and Housekeeping Camp.</li> <li>Move Yosemite Village Day-use Parking Area (Camp 6) north outside the 10-year floodplain.</li> </ul>	<ul style="list-style-type: none"> <li>Ecologically restore 35.6 acres of the 10-year floodplain at former Upper and Lower River campgrounds.</li> <li>Ecologically restore riparian habitat within 150 feet of the river at Backpackers Camp, North Pines and Lower Pines, campgrounds.</li> <li>Ecologically restore a large portion of Housekeeping Camp and four buildings of Yosemite Lodge within the 100-year floodplain.</li> <li>Move Yosemite Village Day-use Parking Area north outside the 10-year floodplain.</li> </ul>	<ul style="list-style-type: none"> <li>Ecologically restore 19.7 acres of riparian habitat in former Upper and Lower River campgrounds; construct campsites 150 feet away from the river</li> <li>Ecologically restore riparian habitat within 150 feet of the river at Backpackers Camp, North Pines, and Lower Pines campgrounds.</li> <li>Ecologically restore portions of Housekeeping Camp in the observed high-water mark.</li> <li>Move Yosemite Village Day-use Parking Area parking north at least 150 feet away from the river.</li> </ul>	<ul style="list-style-type: none"> <li>Ecologically restore 35.6 acres of the 10-year floodplain at former Upper and Lower River Campgrounds; construct new campsites in Upper River outside the 25-year floodplain.</li> <li>Ecologically restore riparian habitat within 100 feet of the river at Backpackers Camp, North Pines, and Lower Pines Campground.</li> <li>Ecologically restore part of Housekeeping Camp within the ordinary high-water mark (bed and banks) of the river.</li> <li>Move Yosemite Village Day-use Parking Area parking north at least 150 feet away from the river.</li> </ul>	<ul style="list-style-type: none"> <li>Ecologically restore 19.7 acres of riparian habitat in former Upper and Lower River Campgrounds and construct new campsites 150 feet away from the river.</li> <li>Ecologically restore riparian habitat within 100 feet of the river at Backpackers Camp, North Pines, and Lower Pines Campground.</li> <li>Ecologically restore part of Housekeeping Camp within the ordinary high-water mark (bed and banks) of the river.</li> <li>Move Yosemite Village Day-use Parking Area parking north at least 150 feet away from the river.</li> </ul>

**TABLE ES-1: SUMMARY OF MAJOR ACTIONS FOR PROTECTING AND ENHANCING RIVER VALUES—COMMON TO ALTERNATIVES 2-6**

	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
<b>Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values</b>					
<b>Meadow and Upland Restoration</b>	<p>Common to Alternatives 2-6:</p> <ul style="list-style-type: none"> <li>Remove abandoned infrastructure, including tiles, pipes, and abandoned roads, and ecologically restore sites.</li> <li>Improve meadow hydrology by removing artificial fill, filling ditches, constructing culverts, and removing remnants of abandoned underground utilities to enhance water flows into meadows (actions in particular meadows would sometimes vary among alternatives).</li> <li>Remove six miles of informal trails to reduce meadow fragmentation; restore disturbed areas to natural conditions; eliminate some roadside parking adjacent to meadows and fence some areas to reduce the potential for informal trailing through sensitive meadow habitat.</li> <li>Eliminate some roadside parking and fence some areas to reduce the potential for informal trailing through sensitive meadow habitat.</li> <li>Improve the condition of plant communities at specific locations in Yosemite Valley (67 potential acres targeted) by restoring the mosaic of meadow, riparian deciduous, black oak, and open mixed conifer forest vegetation. Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure redesign.</li> </ul>				
	<ul style="list-style-type: none"> <li>Remove 900 feet of Northside Drive through Ahwahnee Meadow to enhance connectivity of the meadow and floodplain.</li> <li>Remove 1,335 feet of Southside Drive through Stoneman Meadow to enhance connectivity of the meadow and floodplain.</li> </ul>	<ul style="list-style-type: none"> <li>Remove 900 feet of Northside Drive through Ahwahnee Meadow to enhance connectivity of the meadow and floodplain</li> <li>Remove 1,335 feet of Southside Drive through Stoneman Meadow to enhance connectivity of the meadow and floodplain</li> </ul>	<ul style="list-style-type: none"> <li>Remove 1,335 feet of Southside Drive through Stoneman Meadow to enhance connectivity of the meadow and floodplain</li> </ul>		
<b>Segment 4: El Portal</b>					
<b>Riparian Buffer / Floodplain</b>	<p>Common to Alternatives 2-6:</p> <ul style="list-style-type: none"> <li>Ecologically restore Greenemeyer sand pit.</li> <li>Enhance valley oaks in Old El Portal by creating an oak recruitment area of at least one acre in the vicinity of the current Odger's Fuel Storage Facility.</li> </ul>				

**TABLE ES-1: SUMMARY OF MAJOR ACTIONS FOR PROTECTING AND ENHANCING RIVER VALUES—COMMON TO ALTERNATIVES 2-6**

	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values					
Segment 7: Wawona					
Riparian Buffer / Floodplain	Common to Alternatives 2-6: <ul style="list-style-type: none"><li>Ecologically restore portions of the Wawona Campground. Relocate or remove all campsites currently within 100 feet of the bed and banks of the river.</li></ul>				
	<ul style="list-style-type: none"><li>Ecologically restore the 42-acre Wawona Golf Course to meadow habitat.</li></ul>	<ul style="list-style-type: none"><li>Ecologically restore 42-acre Wawona Golf Course to meadow habitat.</li></ul>			
Scenic Values					
Segment 2: Yosemite Valley					
Iconic Scenic Views	Common to Alternatives 2-6: <ul style="list-style-type: none"><li>Reduce visual intrusions as part of the ecological restoration program.</li><li>Ensure that new development is protective of scenic values.</li><li>Implement management treatments, including removal of vegetation, to protect views from 47 vista points within the river corridor.</li></ul>				
Cultural Values					
Corridorwide					
Archeological and Ethnographic Resources	Common to Alternatives 2-6: <ul style="list-style-type: none"><li>Remove informal trails, non-essential roads, and infrastructure that impacts archeological sites.</li><li>Delineate bike paths, roads, bridle paths, parking, staging, and trails away from sensitive cultural and ethnographic resource areas.</li><li>Remove graffiti, and install fencing around rock art and other sensitive features to discourage inappropriate visitor use</li><li>Develop site management plans for archeological sites with complex uses and impacts such as Yosemite Village.</li></ul>				

**TABLE ES-1: SUMMARY OF MAJOR ACTIONS FOR PROTECTING AND ENHANCING RIVER VALUES—COMMON TO ALTERNATIVES 2-6**

	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
<b>Recreational Values</b>					
<b>Segment 1: Wilderness above Nevada Fall</b>					
<b>Wilderness Recreation</b>	<ul style="list-style-type: none"> <li>Enhance wilderness character by removing the Merced Lake High Sierra Camp and converting this area to designated Wilderness.</li> <li>Reduce zone capacities and convert overnight use to dispersed camping.</li> </ul>	<ul style="list-style-type: none"> <li>Covert Merced Lake High Sierra Camp to temporary stock camp with reduced overnight capacity and convert area to designated Wilderness.</li> <li>Reduce zone capacities and convert overnight use to dispersed camping.</li> </ul>	<ul style="list-style-type: none"> <li>Enhance wilderness character by removing the Merced Lake High Sierra Camp and converting this area to designated Wilderness</li> <li>Reduce zone capacities and size of Little Yosemite Valley Camping Area.</li> <li>Expand footprint of Merced Lake Backpackers Camping Area</li> </ul>	<ul style="list-style-type: none"> <li>Reduce zone capacities and trailhead quotas.</li> <li>Visitor overnight use concentrated to designated camping areas</li> </ul>	<ul style="list-style-type: none"> <li>Visitor overnight use concentrated to designated camping areas</li> </ul>
<b>Segment 2: Yosemite Valley</b>					
<b>River-related Recreation</b>	Common to Alternatives 2-6: <ul style="list-style-type: none"> <li>Improve traffic circulation and access while reducing congestion at key attraction sites.</li> <li>Manage boating to improve dispersed recreation along the river in Yosemite Valley.</li> </ul>				

**TABLE ES-2: YOSEMITE VALLEY VISITATION AND USER CAPACITIES**

Segment 2 Yosemite Valley	Unit Type	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Visitation (per day)	People	20,900 people	13,900 people	13,200 people	17,000 people	19,900 people	21,800 people
Visitor Overnight-Use Capacity *	Lodging and Campsites	6,564 people	4,758 people	5,027 people	7,224 people	7,729 people	9,006 people
Visitor Day-Use Capacity**	Vehicles and buses	8,272 people	6,819 people	6,289 people	7,554 people	8,954 people	9,449 people
* Visitation is defined as the expected use level over a 24-hour period that can be accommodated in Segment 2 (East Yosemite Valley). **User capacity for this segment is defined as the maximum number of people at one time (PAOT) accommodated in Segment 2 (East Yosemite Valley) without adverse effect to river values.							

## ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The Council on Environmental Quality (CEQ) regulations implementing NEPA and the National Park Service NEPA guidelines require “the alternative or alternatives which were considered to be environmentally preferable” be identified (CEQ Regulations, section 1505.2). Environmentally preferable is defined as “the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1981).

Upon full consideration of the elements of NEPA Section 101, Alternative 5 was determined to represent the environmentally preferable alternative for the *Merced River Plan/DEIS*. This conclusion is analyzed in Chapter 8.

## ORGANIZATION: MERCED WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN AND DRAFT ENVIRONMENTAL IMPACT STATEMENT

The information in this document is organized as follows:

### Volume 1

**Chapter 1: The Merced Wild and Scenic River** describes the purpose of the nation’s Wild and Scenic Rivers System and what the designation of the Merced River as part of that system means in terms of river planning and management.

**Chapter 2: The Purpose and Need for the Merced River Plan** describes the purpose and organization of the plan, the major planning issues identified during internal and public scoping, and the interrelationships with other plans and projects.

**Chapter 3: Wild and Scenic River Corridor Boundaries and Segment Classifications** explains the legal requirements for establishing a river corridor boundary and classifying its segments. It also describes the boundary and segment classifications for the Merced River in Yosemite National Park.

**Chapter 4: Determination Process for Water Resource Projects** explains the legal requirements for protecting the river’s free-flowing condition and describes the process that will be used to fulfill that requirement.

**Chapter 5: River Values and Their Management** is the heart of the *Merced River Plan/DEIS*. The chapter presents detailed discussions of the conditions, management concerns, actions for addressing management concerns, and continuing monitoring and protective actions for each river value. The actions to ensure protection of river values presented in this chapter will be common to all alternatives.

**Chapter 6: Visitor Use and User Capacity** describes the process used to address WSRA’s user capacity requirement. The major differences among the plan alternatives (presented in Chapter 8) have to do with the kinds and amounts of use the river corridor could receive in the future.

**Chapter 7: Facilities and Services Analysis** details structures and facilities within each segment of the Merced River corridor in terms of their effect on river values. This chapter also examines the feasibility of relocating, removing or re-designing facilities that cause management considerations with regard to river

values. Information presented in Chapter 7 informed the development of the alternatives presented in Chapter 8.

**Chapter 8: Alternatives** presents the six alternatives (no action alternative plus five action alternatives) currently under consideration in the *Merced River Plan/DEIS*. The differences among the alternatives revolve primarily around possible differences in visitor use and user capacity. Most of the actions needed to protect and enhance river values are common to all the action alternatives although some variations exist.

## Volume 2

**Chapter 9: Affected Environment and Environmental Consequences** identifies and describes the natural and sociocultural resources and values that could be affected by the alternatives presented in Chapter 8 and evaluates and compares the potential effects of the alternatives. Chapter 9 looks comprehensively at the components of the human environment that might be affected by the plan and assesses how they might be affected by actions intended to protect and enhance river values.

**Chapter 10: Consultation and Coordination** summarizes all consultation and coordination efforts undertaken to date for the *Merced River Plan/DEIS*. It outlines the project scoping history and the much broader public involvement history that extended through every step of the development of the plan alternatives. It describes specific consultations with the traditionally associated American Indian tribes and the federal, state, and local agencies having jurisdiction or particular interests in the Merced River corridor. Chapter 10 also includes a list of the agencies, organizations, and businesses that received the *Merced River Plan/DEIS*.

**Chapter 11:** List of Preparers

**Chapter 12:** Glossary and Acronyms

**Chapter 13:** References

## Appendices

Appendix A: Actions that Amend the ‘General Management Plan’

Appendix B: Cumulative Actions

Appendix C: Mitigation Measures

Appendix D: Draft Floodplain Statement of Findings

Appendix E: Proposed Restoration Actions

Appendix F: Acoustical Measurement Locations

Appendix G: On-road Vehicle Criteria Pollutant and GHG Emission Estimates

Appendix H: Scenic Vista Management

Appendix I: Yosemite Valley Historic District Resources

Appendix J: NHPA Assessment of Effect for Site-specific Actions

Appendix K: Management Considerations and Actions

Appendix L: Determination of Extent Necessary

Appendix M: Changes to the ORVs Over Time

Appendix N: Draft Biological Assessment

Appendix O: Draft Wetland Statement of Findings

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# 1. THE MERCED WILD AND SCENIC RIVER

The U.S. Congress designated the Merced River in Yosemite National Park as a component of the National Wild and Scenic Rivers System in 1987 (Public Law 100-149). This action amended the 1968 Wild and Scenic Rivers Act (WSRA) (16 USC 1271), which states:

*“It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.”*

The Merced River (Figure 1-1) originates in Yosemite at the crest of the Sierra Nevada and descends almost 10,000 feet in elevation on its 81-mile journey through the park. The river has been central to this dramatic landscape for tens of thousands of years, and it continues to shape riparian and meadow communities and support a diverse suite of wildlife. The river was home to American Indians for millennia, and cultural traditions associated with the river continue to the present day. The Merced River is also a focus for millions of Yosemite visitors who enjoy opportunities for recreation, education, reflection, and inspiration in the sublime beauty of the river corridor.

**Figure 1-1: Merced Wild and Scenic River Overview Map**



The National Park Service (NPS) is the managing agency for the portions of the Merced Wild and Scenic River in Yosemite and the El Portal Administrative Site. As part of this responsibility, the NPS must develop a Wild and Scenic River comprehensive management plan to guide long-term management and public use in the river corridor. The NPS will develop the plan in accordance with the mandates of the National Environmental Policy Act (NEPA) and document the process with an Environmental Impact Statement (EIS) and subsequent Record of Decision. This document encompasses the draft comprehensive river management plan and associated Draft EIS, collectively referred to as the *Merced River Plan/Draft Environmental Impact Statement*. The NPS intends to release a final EIS in summer 2013.

The *Merced River Plan/DEIS* addresses the required elements of WSRA while complying with the planning processes required by NEPA, the National Historic Preservation Act, and other legal mandates that govern decision-making and planning in the NPS. The NPS expects the plan to have a lifespan of at least 20 years. The plan also fulfills public review requirements under the California Environmental Quality Act.

## THE WILD AND SCENIC RIVERS ACT

Congress established WSRA to counterbalance decades of dam building and river-related development by mandating the protection of some outstanding rivers in their natural, free-flowing state. A *Wild and Scenic River* has “outstandingly remarkable values” (ORVs) that make it worthy of special protection for the benefit and enjoyment of present and future generations. Federal land managers must protect and enhance the values for which a river was designated as a Wild and Scenic River. Today, WSRA protects a select amount—12,600 miles (or less than ¼ of 1%)—of U.S. rivers and creeks as units of the National Wild and Scenic Rivers System. Two Wild and Scenic rivers are located within Yosemite: the Merced River (designated in 1987) and the Tuolumne River (designated in 1984). The Merced River is one of 23 Wild and Scenic Rivers in California and one of six Wild and Scenic Rivers on the western slope of the Sierra Nevada.

## REGIONAL SETTING

Within the Sierra Nevada range of California, the Merced River is one of 15 major river systems. Originating in Yosemite’s alpine peaks, the Merced River flows west for 145 miles to its confluence with the San Joaquin River outside the park in the Central Valley of California, encompassing a drainage basin of 1,700 square miles. The first 122 miles of the Merced River are designated as Wild and Scenic; the NPS manages 81 miles of the river through Yosemite and El Portal, including both the Merced River’s main stem and the South Fork Merced River. Within Yosemite, the river reaches contain some of the world’s most-admired scenery, including grand waterfalls and large, mid-elevation meadows. As the Merced River flows outside Yosemite’s western boundary, the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) manage the next 41 miles of the Wild and Scenic River (Public Law 102-432). The remaining 23 miles of the Merced River below Lake McClure and the New Exchequer Dam, located in the Central Valley, do not have Wild and Scenic River status.

The headwaters of the main stem of the Merced River originate in Yosemite in several watersheds: the Lyell Fork, Triple Peak Fork, Merced Peak Fork, and Red Peak Fork. These watersheds are at the far eastern side of the Merced River watershed, with the Tuolumne, Mono, and San Joaquin River watersheds to the north, east, and south. From its headwaters, the main stem of the Merced River flows freely through a wilderness landscape of alpine peaks, glacially carved valleys, and high-elevation meadows. The river makes a dramatic entry into Yosemite Valley, rushing over towering cliffs in prominent waterfalls. As the gradient lessens, the

Merced River meanders through the rich meadow and riparian habitat of Yosemite Valley. At the west end of Yosemite Valley the canyon narrows, and the river becomes a cascade of continuous rapids through the Merced Gorge. The gradient changes abruptly at the park boundary, where the river continues through El Portal on its journey through the Sierra Nevada foothills to the Central Valley of California.

The South Fork Merced River originates at the Sierra crest from the southwestern slopes of Triple Divide Peak and the west facing slopes of Gale Peak and Sing Peak. The South Fork Merced River flows southwest through Yosemite Wilderness (south of the Clark Range) and the community of Wawona. The South Fork Merced River exits the park less than a mile below the Wawona Campground, and then flows through the Sierra National Forest to the confluence of the main stem of the Merced River west of El Portal.

The Merced River's main stem and the South Fork Merced River will be collectively referred to as the Merced River in this document from this point.

## GOALS OF THE MERCED RIVER PLAN

The 1980 *General Management Plan* for Yosemite National Park provides long-range management direction for Yosemite. The *Merced River Plan* will amend parts of the *General Management Plan* related to the Merced River corridor, as directed in the 1987 legislation designating the Merced River as a component of the National Wild and Scenic River System. In this legislation, Congress directed that:

*“appropriate revisions to the general management plan for the park, and the boundaries, classification, and development plans for such portions need not be published in the Federal Register. Such revisions to the general management plan for the park shall assure that no development or use of park lands shall be undertaken that is inconsistent with the designation of such river segments (16 U.S.C. Section 1274 (a)(62)(A)).”*



Appendix A summarizes the actions in the *Merced River Plan/DEIS* that would amend the *General Management Plan*.

The overall goal of the *Merced River Plan/DEIS* is to provide for public recreation and resource use while protecting and enhancing the values for which the Merced River was designated a Wild and Scenic River. The planning team developed goals that are more specific for the *Merced River Plan/DEIS* after analysis of public scoping comments. These specific goals of the *Merced River Plan/DEIS* are to:

- ***Protect and Enhance Ecological and Natural Resource River Values:*** Promote the ability of the Merced River to shape the landscape by reducing impediments to free flow, improving geologic/hydrologic processes, restoring floodplains and meadows, and protecting water quality.
- ***Provide Opportunities for Direct Connection to River Values:*** Support opportunities for people to experience and develop direct connections to the Merced River and its unique values as a place of cultural association, education, recreation, reflection, and inspiration.
- ***Institute a Visitor-Use Management Program:*** Institute a visitor-use management program that provides for high-quality, resource-related recreational opportunities in the river corridor while protecting and enhancing natural and cultural river values today and into the future.
- ***Determine Land Uses and Associated Developments:*** Provide clear direction on land uses and associated developments in the river corridor, allowing for the infrastructure necessary to support the protection and enhancement of river values.



**Figure 1-2: MRP / DEIS Organization**

<b>'Merced River Plan / DEIS' Document Organization</b>	
<b>Volume 1</b>	
Abstract	
Executive Summary	
Chapter 1: Introduction	
Chapter 2: Purpose and Need for the Plan	
Chapter 3: River Boundaries and Segment Classifications	
Chapter 4: Section 7 Determination Process	
Chapter 5: River Values and their Management	
Chapter 6: Visitor Use and User Capacity	
Chapter 7: Facilities and Services Analysis	
Chapter 8: Alternatives	
• Introduction	
• Detailed Description of Alternatives	
• Actions Considered but Dismissed	
• Cost Comparison	
• Comparisons of User Capacities and Alternative Actions	
• River Value Analysis	
<b>Volume 2</b>	
Chapter 9: Affected Environment and Environmental Consequences	
Chapter 10: Consultation and Coordination	
Chapter 11: List of Preparers	
Chapter 12: Glossary and Acronyms	
Chapter 13: References	
Appendices	
	<b>Merced River Plan Elements (as required by WSRA)</b>
	<b>Draft Environmental Impact Statement (as required by NEPA)</b>

## THIS DOCUMENT'S ORGANIZATION

The *Merced River Plan/DEIS* is a two-volume set, with appendices provided digitally or online at

<http://www.nps.gov/yose/parkmgmt/mrp.htm>.

Figure 1-2 displays the organization of the plan and the sections that comprise the *Merced Wild and Scenic River Comprehensive Management Plan / Draft Environmental Impact Statement*.

<b>'Merced River Plan / DEIS' Appendix Organization</b>	
<b>Appendices in Volume 2</b>	
Appendix A: Actions that Amend the 'General Management Plan'	
Appendix B: Cumulative Actions	
Appendix C: Mitigation Measures	
Appendix D: Draft Floodplain Statement of Findings	
Appendix E: Proposed Restoration Actions	
Appendix F: Acoustical Measurement Locations	
Appendix G: On-road Vehicle Criteria Pollutant and GHG Emission Estimates	
Appendix H: Scenic Vista Management	
Appendix I: Yosemite Valley Historic District Resources	
Appendix J: NHPA Assessment of Effect for Site-specific Actions	
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Appendix L: Determination of Extent Necessary	
Appendix M: Changes to the ORVs Over Time	
Appendix N: Draft Biological Assessment	
Appendix O: Draft Wetland Statement of Findings	

## 2. PURPOSE AND NEED FOR THE ‘MERCED RIVER PLAN’

This chapter describes the purpose and need for the *Merced Wild and Scenic River Comprehensive Management Plan/Draft Environmental Impact Statement (Merced River Plan/DEIS)* and discusses the issues and opportunities addressed in the plan. Specifically, this chapter includes:

- Statements of the purpose and need for taking action
- The planning context of the plan, including the legal framework, recent legal history, and interrelationships with other plans
- A discussion of issues and opportunities identified during the scoping process and considered in preparation of this plan, and issues dismissed from further analysis.

### PURPOSE OF AND NEED FOR THE PLAN

The purpose of the *Merced River Plan/DEIS* is to preserve the Merced River in free-flowing condition, and to protect the water quality and outstandingly remarkable values (ORVs) that make the river worthy of designation, for the benefit and enjoyment of present and future generations. In accordance with WSRA “the plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act” (WSRA Section 3(d)). This plan will fulfill the specific direction of the 1987 legislation designating the Merced River as a component of the National Wild and Scenic River System (16 U.S.C. Section 1274 (a)(62)(A)) and make appropriate revisions to the park’s 1980 *General Management Plan*.

The need for the *Merced River Plan/DEIS* also derives from a 2009 *Settlement Agreement* under which the National Park Service (NPS) agreed to complete a new comprehensive management plan for the Merced Wild and Scenic River by July 2013. The U.S. Forest Service (USFS) and Bureau of Land Management (BLM) completed plans for the river segments within their jurisdiction. The finished plan for the Yosemite segments will complete the management plans needed for the entire Merced Wild and Scenic River.

### LEGAL AND POLICY FRAMEWORK

The management of the NPS is guided by the Constitution, public laws, treaties, proclamations, executive orders, regulations, and directives of the Secretary of the Interior and the Assistant Secretary for Fish and Wildlife and Parks. The NPS Organic Act, passed by the U.S. Congress in 1916, provides fundamental management direction for all units of the National Park System. A key management provision in the act is:

*“[The National Park Service] shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”*

Congress amended the Organic Act with the 1970 General Authorities Act (16 USC 1a-1 et seq.), which affirms that that all of the nation’s parks—whether they include natural, cultural or historic resources—are

united under the mission, purpose and protection of the Organic Act. The 1978 Redwood National Park Expansion Act also amended the Organic Act, re-affirming the mandate and directing the NPS to manage park lands in a manner that would not degrade park values.

In addition to these key management-related statutes, federal management decisions must be consistent with national laws, including the National Environmental Policy Act (NEPA) and the National Historic Preservation Act of 1966, which define the process used to evaluate and make planning-related decisions. The following provides more detail on the NPS Organic Act and a summary of additional federal laws most relevant to this planning process, including WSRA, the Wilderness Act of 1964, and the 1998 Concessions Management Improvement Act.

## National Park Service Organic Act, and National Parks and Recreation Act

The NPS was created by the National Park Service Organic Act of 1916 (USC 2-4) for the purpose of promoting and regulating a system of national parks.- This broad mandate has been translated into an extensive set of management policies, which direct all aspects of park management (NPS 2006a).

The NPS has a specific set of policies in place to implement the requirements of law, fulfill management responsibilities under the NPS Organic Act, and guide agency operations. NPS *Management Policies* (2006) is the basic NPS policy document, and the highest level of guidance in the NPS Directives System. Director's Orders are the second level of the Directives System, and they serve as a vehicle to clarify or supplement the *Management Policies*. Reference manuals or handbooks with detailed guidance make up the third level of the NPS Directives System.

Since 1978, the NPS has been required under the National Parks and Recreation Act (16 USC 1a-7) to prepare general management plans for all units of the National Park System. The relationship between the *Merced River Plan* and the *General Management Plan* for Yosemite National Park is described below under "Interrelationships with Other Plans and Projects."

## Wild and Scenic Rivers Act Requirements

The segments of the Merced River covered by the *Merced River Plan/DEIS* were part of Yosemite National Park when they were designated as part of Wild and Scenic River System in 1987. As part of the national park, these river segments are also managed under the provisions of the laws, policies, and regulations applicable to all units of the National Park System. Section 10(c) of WSRA specifies that in case of conflicts between the mandates of the two systems, the more restrictive provisions apply.

The following sections of WSRA are most pertinent to the *Merced River Plan/DEIS*:

**Section 1: Congressional Declaration of Policy**—Explains intent of WSRA in that designated rivers "shall be preserved in free-flowing condition, and ... their immediate environments shall be protected for the benefit and enjoyment of present and future generations" (16 USC 1271), as quoted in the first paragraph of "The Merced Wild and Scenic River" (Chapter 1).

**Section 2: Classifications**—Requires the river be classified and administered as "wild," "scenic," or "recreational" river segments, based on the condition of the river corridor at the time of designation. The classification of a river segment indicates the level of development on the shorelines, the level of development in the watershed, and the accessibility by road or trail.

**Section 3: Congressionally Designated Components, Establishment of Boundaries, Classifications, and Management Plans**—Lists rivers that are congressionally designated as National Wild and Scenic Rivers System components. Section 3 requires the administering agency to identify corridor boundaries and to prepare a comprehensive management plan to “provide for the protection of the river values.”

**Section 7: Restrictions on Hydro and Water Resource Development Projects**—Section 7 (16 USC 1278) is one of the most vital components of WSRA. This provision directs federal agencies to protect the values of designated rivers from adverse effects of “water resources projects” within the bed and banks of the river. Section 7 requires a rigorous process to ensure proposed water resources projects, implemented or assisted by federal agencies within the bed and banks of designated rivers, do not have a “direct and adverse effect” on the values for which the river was designated. It includes procedures to determine whether projects above or below the designated river or on its tributary streams would invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the designated corridor.

**Section 10: Management Direction**—Section 10 sets forth the management direction for designated river segments and includes the following:

- WSRA shall be administered to *protect and enhance* a river’s ORVs. Insofar as possible, uses that are consistent with this and do not substantially interfere with public enjoyment and use of these values should not be limited (16 USC 1281[a]).
- In administration of a Wild and Scenic River, “primary emphasis shall be given to protecting its aesthetic, scenic, historic, archeologic, and scientific features. Management plans may establish varying degrees of intensity for its protection and development, based on the special attributes of the area” (16 USC 1281[a]).
- Wild and Scenic River segments inside congressionally designated Wilderness are subject to both WSRA and the Wilderness Act. Where the two conflict, the more restrictive (i.e., protective of resources) regulation will apply (16 USC 1281[b]).
- Any component of the National Wild and Scenic Rivers System administered by the NPS will become part of the National Park System and be subject to both WSRA and the acts under which the National Park System is administered. In the case of conflict among these acts, the more restrictive provisions will apply (16 USC 1281[c]).

Section 10(e) enables administering federal agencies to enter into cooperative agreements with state and local governments to allow them to participate in the planning and administration of components of the Wild and Scenic Rivers System that include or adjoin state- or county-owned lands.

**Section 12: Management Policies**—Section 12 directs the managing agency to take management actions on lands under its jurisdiction adjacent to the designated river corridor that may be necessary to protect the river according to the purposes of WSRA.

### ***1982 Final Revised Guidelines for Eligibility, Classification, and Management of River Areas (Secretarial Guidelines)***

In 1982, the Secretary of the Interior and Secretary of Agriculture jointly revised the guidelines for implementing WSRA. The revision, called the *National Wild and Scenic River System: Final Revised Guidelines for Eligibility, Classification and Management of River Areas*, is referred to as the Secretarial Guidelines. Published in the *Federal Register* in 1982, the Secretarial Guidelines incorporate changes in

WSRA necessary after more than a decade of use under the original 1970 guidelines<sup>1</sup>, facilitating greater consistency in agency interpretation of WSRA. The Secretarial Guidelines reflect new laws and regulations and respond to a 1979 presidential directive to consider river ecosystems in river evaluation and shorten river study time. The Secretarial Guidelines clarify the eligibility of free flowing rivers and river segments, eliminate minimum length guidelines, revise the definition of sufficient flow, revise water quality management, and accelerate the schedule for congressionally authorized studies (USDI and USDA 1982).

## Wilderness Act

The Yosemite Wilderness was added to the National Wilderness Preservation System by the 1984 California Wilderness Act. Segments of the Merced Wild and Scenic River corridor within Yosemite National Park are within this congressionally designated Wilderness.

WSRA specifies that both it and the Wilderness Act apply when a Wild and Scenic River is located in designated Wilderness:

*“Any portion of a component of the National Wild and Scenic Rivers System that is within the National Wilderness Preservation System, as established by or pursuant to the Act of September 3, 1964 (78 Stat. 890; 16 U.S.C., ch. 23), shall be subject to the provisions of both the Wilderness Act and this Act with respect to preservation of such river and its immediate environment, and in case of conflict between the provisions of these Acts the more restrictive provisions shall apply.”*

The National Wilderness Preservation System was established by the Wilderness Act of 1964 (PL 88-577, 16 USC 1131-1136) to secure for present and future generations the benefits of an enduring resource of wilderness. The Wilderness Act requires that areas of designated Wilderness be managed in ways that preserve their wilderness character. A Wilderness area, as defined by the act, is

*“an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean. . . an area. . . retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable, and (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation.”*

Congress has delegated the management of the Yosemite Wilderness to the NPS. The *NPS Management Policies 2006* requires the superintendent of each park containing wilderness resources to develop a wilderness management plan or equivalent planning document to guide the preservation, management, and use of these resources. The relationship between the *Merced River Plan* and the *Yosemite Wilderness Management Plan* is described below under “Interrelationships with Other Plans and Projects.”

The NPS is required to consider the effects of commercial use in the Yosemite Wilderness as part of its delegated responsibility to maintain the wilderness character of the lands under its charge. A “Determination of Extent Necessary for Commercial Services in the Wilderness Segments of the Merced Wild and Scenic River Corridor” has been prepared as part of this planning for the Merced River (see Appendix L).

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<sup>1</sup> “Guidelines for Evaluating Wild, Scenic and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic Rivers System under Section 2, Public Law 90-542”



## National Environmental Policy Act

Pursuant to section 102(2) (C) of the National Environmental Policy Act of 1969 (NEPA [42 USC 4341 et seq.]), the NPS has prepared a draft environmental impact statement identifying and evaluating six alternatives (the No Action and five action alternatives) for the *Merced River Plan*. Regulations governing NEPA compliance are set by the President's Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508). CEQ regulations establish the requirements and process for agencies to fulfill their obligations under the act. This draft environmental impact statement documents compliance with two fundamental NEPA requirements: 1) To make a careful, complete, and analytical study of the impacts of any proposal, and alternatives to that proposal, if it has the potential to affect the human environment, well before decisions are made and 2) To be diligent in involving interested or affected public members in the planning process.

Compliance with the National Historic Preservation Act (see below) is integrated into the NEPA compliance process, using NHPA criteria for the analysis of impacts on cultural resources. The NEPA process is also used to coordinate compliance with other federal laws and regulations applicable to the decisions to be made as part of the *Merced River Plan/DEIS*, including but not limited to the following:

- Americans with Disabilities Act (42 USC 12101 et seq.)
- Clean Air Act (as amended, 42 USC 7401 et seq.)
- Clean Water Act (33 USC 1241 et seq.)
- Endangered Species Act (16 USC 1531 et seq.)
- Executive Order 11593: Protection and Enhancement of the Cultural Environment
- Executive Order 11988: Floodplain Management
- Executive Order 11990: Protection of Wetlands
- Wilderness Act

## National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA [16 USC 470]) directs federal agencies to take into account the effect of any undertaking (a federally funded or assisted project) on historic properties. A "historic property" is any district, building, structure, site, or object, including resources that are considered by American Indians or other communities to have cultural and religious significance, that is eligible for listing in the National Register of Historic Places (NRHP) because the property is significant at the national, state, or local level in American history, architecture, archeology, engineering, or culture. Section 106 also provides the Advisory Council on Historic Preservation (ACHP) and the state historic preservation officer (SHPO) an opportunity to comment on assessment of effects by the undertaking. Yosemite's section 106 review process is governed by national and park-specific programmatic agreements among the NPS, the Advisory Council for Historic Preservation, and the National Council of Historic Preservation Officers or the California state historic preservation officer (NPS, ACHP, and NCSHPO 2008; NPS, SHPO, and ACHP 1999). As stated above, compliance with NHPA section 106 is integrated into the NEPA compliance process, using NHPA criteria for the analysis of impacts on cultural resources.

The section 106 review process is also used to coordinate compliance with the following federal laws and regulations applicable to the decisions to be made as part of the *Merced River Plan*.

### ***Archaeological Resources Protection Act***

The Archeological Resources Protection Act of 1979 (ARPA [16 USC 470aa- 470ll]) prohibits unauthorized excavation of archeological sites on federal land, as well as other acts involving cultural resources, and implements a permitting process for excavation of archeological sites on federal or Indian lands (see regulations at 43 CFR 7). The act also provides civil and criminal penalties for removal of, or damage to, archeological and cultural resources. Historic properties are addressed in Volume 2, Chapter 9.

### ***Native American Graves Protection and Repatriation Act***

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA [25 USC 3001 et seq. and its implementing regulations at 43 CFR 10]) provides for the protection and repatriation of Native American human remains and cultural items and requires notification of the relevant Native American tribe upon accidental discovery of cultural items. Resources covered by NAGPRA are addressed in Volume 2, Chapter 9, and the process for handling these resources is included in the national and park-specific programmatic agreements.

### ***American Indian Religious Freedom Act***

The American Indian Religious Freedom Act of 1979 (AIRFA [42 USC 1996]) preserves for American Indians and other indigenous groups the right to express traditional religious practices, including access to sites under federal jurisdiction. Regulatory AIRFA guidance is lacking, although most land-managing federal agencies have developed internal procedures to comply with the act. Access to American Indian traditional religious practice sites is addressed in the parkwide programmatic agreement (1999 PA) and will be addressed in further detail in the plan-specific programmatic agreement.

### ***Executive Order No. 13007: Indian Sacred Sites***

Executive Order 13007 directs federal agencies with statutory or administrative responsibility for the management of federal lands, to the extent practicable and permitted by law, to accommodate access to and ceremonial use of Indian sacred sites by American Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites. Access to and ceremonial use of American Indian sacred sites is addressed in the parkwide programmatic agreement (1999 PA) and will be addressed in further detail in the plan-specific programmatic agreement.

### **1998 Concessions Management Improvement Act (Public Law 105-391)**

In 1998, with the objective of improving concessions and increasing competition of contracts, Congress enacted the 1998 Concessions Management Improvement Act. Some of the major changes incorporated into the 1998 act include reduced preferential right situations, franchise fee distribution changes, new competitive bid requirements, and increased accountability and oversight. The 1998 act requires that contracts for visitor facilities and services "... be limited to those that are necessary and appropriate for public use and enjoyment..." of the national park area in which they are located "... and that are consistent to the highest practicable degree with the preservation and conservation of the areas ... ." Title 36 of the Code of Federal Regulations (36 CFR 51) outlines the requirements for the preservation of the parks and administration of commercial service operations. The *Merced River Plan/DEIS* will establish the extent

necessary determination for commercial use in Wilderness areas of the river corridor in compliance with this act. It will also analyze necessary and appropriate public-use facilities in the river corridor.

## Merced River Plan's Legal History

In 2009, the NPS settled a long running lawsuit challenging the adequacy of the two prior versions of the Merced River Plan. This section summarizes the history of the lawsuit and the relevance of the *2009 Settlement Agreement* to the development of the *2013 Merced River Plan/DEIS*.

In August 2000, the NPS completed the first iteration of the *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement (2000 Merced River Plan)*. Two organizations—Friends of Yosemite Valley and Mariposans for the Environment and Responsible Government (formerly Mariposans for Environmentally Responsible Growth)—sued the NPS in the U.S. District Court for the Eastern District of California alleging that the *2000 Merced River Plan* violated both WSRA and NEPA. The district court ruled in the NPS' favor on most issues, and the two plaintiff organizations appealed the case to the U.S. Court of Appeals for the Ninth Circuit Court (Ninth Circuit Court). On appeal, the Ninth Circuit Court reversed the decision of the district court. Of particular importance, the Ninth Circuit Court found that the *2000 Merced River Plan* failed to adequately address user capacities. In its 2003 opinion, the Ninth Circuit Court stated that under WSRA, a comprehensive management plan must include “specific measurable limits on use;” and that it must “deal with or discuss the maximum number of people that can be received” in a Wild and Scenic River corridor. The Ninth Circuit Court also found that the NPS had improperly drawn the boundary for the El Portal segment of the river.

In June 2005, the NPS prepared the *Merced Wild and Scenic River Revised Comprehensive Management Plan/Supplemental Environmental Impact Statement (2005 Revised Merced River Plan)*, in response. Then, in November 2005, the same plaintiffs challenged the *Revised Merced River Plan/SEIS* under WSRA and NEPA.

In 2006, the district court found that the *2005 Revised Merced River Plan* failed to address user capacity in accordance with Ninth Circuit Court's 2003 opinion. The district court also concluded that the *2005 Revised Merced River Plan* failed to comply with NEPA because it was not prepared as a “self-contained” plan, it did not have a true No Action alternative, and because it had an inadequate range of alternatives.

The NPS appealed the district court's ruling to the Ninth Circuit Court. In 2008, the Ninth Circuit Court issued an opinion upholding the district court ruling. The Ninth Circuit Court found that the *2005 Revised Merced River Plan* was “reactionary” because it did not describe an actual level of visitor use that will not adversely affect the ORVs of the Merced River. In the court's view, the *2005 Revised Merced River Plan's* “Visitor Experience and Resource Protection” framework failed to satisfy the user-capacity mandate of the WSRA because the framework did not trigger management action before degradation occurred. The Ninth Circuit Court also held that the plan's interim visitor-use limits were based on current capacities and that the NPS did not demonstrate how such limits would protect and enhance river values. Regarding NEPA, the court held that the range of actions in the alternatives was unreasonably narrow, that the plan should have been prepared as a single, comprehensive document; and that the No Action Alternative should not have included elements of the invalid *2000 Merced River Plan*.

The NPS entered into mediation with the plaintiffs in fall 2008 in an effort to resolve the litigation and agree upon a schedule for preparing the next version of the Merced River Plan. A court-mediated settlement agreement was executed Sept. 29, 2009. The *2009 Settlement Agreement* directs that the Merced River Plan be completed by July 2013. (The settlement originally called for the plan to be completed by December

2012, but in 2011, the parties extended the deadline by six months.) The settlement agreement provides that the NPS will prepare the plan with the assistance of designated user-capacity experts and that there will be extensive, frequent and robust public involvement in the development of the plan. The settlement agreement acknowledges that the new MRP may include both site-specific and programmatic elements. The NPS may also retain the boundaries, classifications and Section 7 process from the *2005 Revised Merced River Plan*. However, the settlement agreement requires NPS to develop revised outstanding remarkable values and a revised user capacity program in accordance with applicable legal directives including the Ninth Circuit Court’s opinions discussed above.

Until the new plan is complete, the settlement agreement limits the types of actions that the NPS can conduct in the river corridor. In general, the NPS may undertake routine, intermittent and operational actions within the corridor. The NPS cannot construct new roads, parking spaces, bridges, large structures or overnight accommodations. The NPS also cannot take actions that would pre-determine user capacity in any segments of the river.

### **Interrelationships with ‘General Management Plan’ for Yosemite (1980)**

The 1980 *General Management Plan* for Yosemite National Park (GMP), as amended by the 1992 *Concession Services Plan*, is the overall management document for Yosemite National Park. The *Merced River Plan/DEIS* will amend parts of the GMP, as directed in the 1987 legislation designating the Merced River as a Wild and Scenic River. In addition, an appendix to the *2009 Settlement Agreement* states that the NPS will “define how the Plan/EIS will amend the 1980 Yosemite General Management Plan” in the *Merced River Plan/DEIS*. Appendix A describes the amendments to the GMP proposed in the *Merced River Plan/DEIS*.

The *Merced River Plan/DEIS* reflects the overarching goals and objectives of the GMP. The NPS has implemented or partially-implemented many river-related actions of the GMP, and the results of these actions are considered elements of the No Action Alternative described in “Alternatives” (Chapter 8). Some GMP actions have not been implemented to date, and the NPS considered inclusion of a comprehensive GMP alternative that would include all the outstanding GMP actions in the Merced River corridor in the *Merced River Plan/DEIS*. The NPS did not carry this idea forward, as a comprehensive GMP alternative would not be feasible as a stand-alone alternative. For example, some GMP actions do not meet the requirements of WSRA, as the Congress designated the Merced Wild and Scenic River in 1987 after the GMP was established in 1980. A stand-alone “GMP alternative” would be missing some components required in a comprehensive Wild and Scenic River management plan (Table 2-1). Instead, outstanding actions of the GMP in the river corridor are considered as part of the range of alternatives in the *Merced River Plan/DEIS* if they are actions that guide river protection and public use in the river corridor, protect and enhance river values, and establish a visitor capacity that is protective of these values. The NPS used the planning framework described in “Alternatives” (Chapter 8) to determine which GMP actions would be included in the alternatives.

### ***GMP Actions Presented in the ‘Merced River Plan/DEIS’***

The NPS has implemented many GMP actions that continue to play a substantial role in protecting and enhancing Merced River values. In 1982, construction began on a large tertiary sewage treatment plant in El Portal, and since that time, the system has had regular upgrades that help to protect the water quality of the Merced River. In 1984, Congress designated 95% of Yosemite as part of the National Wilderness Preservation System, and about 70% of the Merced River corridor became designated Wilderness. In the years between

1985 and 1986, the NPS permanently closed the hydroelectric plant and penstock in Segment 3 (the Gorge). The Cascades Dam was removed in 2003, and, soon after, a small dam upstream of Happy Isles was removed. As a result of these actions to restore the free-flowing condition of the river, the Merced River's main stem from its headwaters to the western border of the El Portal Administrative Site is free of all impoundments. The replacement bridge over the South Fork Merced River in Wawona was constructed without in-channel piers, enhancing the free-flowing condition of the river. In addition, the NPS restored the Wawona Covered Bridge in 1983 to address structural safety hazards. Many river-related ecological restoration actions, including removal of underground infrastructure in meadows and the river channel, protect and enhance river values.

### *Types of 'MRP/DEIS' Actions that Differ from the 'General Management Plan'*

A key goal of the GMP is to “markedly reduce traffic congestion,” ultimately leading to removal of private vehicles in Yosemite Valley. The *Merced River Plan/DEIS* examines a range of alternatives that markedly reduce traffic congestion and are feasible under current conditions. Alternatives 2-6 propose enhancements to circulation and parking, expand the regional public transit system, and propose new service between Fresno and Yosemite Valley. These actions reflect the ultimate goals of the GMP. While reducing traffic congestion, none of the alternatives proposes the complete removal of private vehicles in Yosemite Valley for reasons that include:

- The infrastructure to support a system to transport all visitors into Yosemite Valley is not in place, and the funding required to develop a large internal system is not available.
- The large amount of buildable land required for satellite parking lots in El Portal, Crane Flat, and Wawona (as proposed in the GMP) is not available due to resource constraints and other issues.
- The complex planning process required to develop an external regional transportation system is not possible to complete within the court-mandated timeframe to complete this plan.

The *Merced River Plan/DEIS* uses a more detailed approach to address the issues of visitor use and user capacity than the GMP. Since establishment of the GMP, a legal record has been established for the Merced River, interpreting the mandates of the WSRA and Secretarial Guidelines with regard to the issues of visitor use and user capacity. The GMP does not propose limits on the number of day users in the park but acknowledges that this may be necessary sometime in the future. The GMP achieves appropriate overnight- and day-use levels by limiting the number of overnight accommodations, campsites, and day-use parking spaces available. It directs the park to restrict access when the park reaches these capacities. The U.S. Court of Appeals for the Ninth Circuit stated “although the WSRA does not preclude basing user capacity limits on current capacity limits, NPS’ decision to base many of its interim limits on current capacity limits was not ‘founded on a reasoned evaluation of the relevant factors’ ” (Yosemite I, 348 F.3d at 793). The NPS must “adopt specific limits on user capacity” that “describe an actual level of visitor use that will not adversely impact” river values. The *Merced River Plan/DEIS* adopts a process to address user capacity that meets this mandate, as described in “Visitor Use and User Capacity” (Chapter 6).

The 1997 flood was the largest flood in the Merced River corridor since the establishment of the Happy Isles Gauging Station in 1916. This flood changed the landscape of the river corridor, making some GMP actions infeasible. For example, before the 1997 flood, the GMP prescribed 768 total campsites in Yosemite Valley (not counting Backpackers Campground). After the flood, the NPS removed campsites damaged by the flood, and 466 campsites remain in Yosemite Valley. The *Merced River Plan/DEIS* evaluates areas in Yosemite Valley for potential new campsites and proposes campsite totals ranging from 450 campsites (Alternative 2) to



739 campsites (Alternative 6). All campsite totals are lower than prescribed in the GMP because some campsite locations of the GMP would not protect and enhance river values as directed by WSRA.

The *Merced River Plan/DEIS* does not include some GMP actions related to the level of commercial services in Yosemite Valley. The Opinion of the Eastern District of California in 2008<sup>2</sup> refers to levels of facilities and services operating within the river corridor, and the need to ensure that all facilities and services protect and enhance the river's unique values. The *Merced River Plan/DEIS* expands on the GMP objective "to permit only those levels and types of accommodations and services necessary for visitor use and enjoyment of Yosemite" and meet the mandates of WSRA. The *Merced River Plan/DEIS* evaluates every major facility in the river corridor as to whether it is essential, or necessary to meet the visitor experience desired under each alternative (see "Facilities and Services Analysis" Chapter 7). For example, the Merced River Plan's Alternative 5, as well as the GMP, retains 232 units at Housekeeping Camp, but the plan's Alternative 5 also proposes removal of the small grocery store at Housekeeping Camp.

Some actions prescribed in the GMP ultimately differed after they went through a site-specific NEPA planning process. For example, the GMP specifies a parking area with 50 parking spaces at the base of the trail to lower Yosemite Falls. In the environmental assessment process to develop a site-specific plan for the area, the NPS determined that the parking area would not fit the overall design vision for the area, and selected an alternative to relocate the parking and convert the area to natural conditions. Under Alternatives 2-6 in the *Merced River Plan/DEIS*, the Lower Yosemite Falls area remains in its current configuration, as described in the No Action alternative.

The comprehensive alternatives proposed in the *Merced River Plan/DEIS* integrate GMP actions that meet the purpose and need of the plan and integrate additional actions necessary actions to meet the requirements of the WSRA. While the GMP is the overarching management document for Yosemite, the *Merced River Plan/DEIS* does not evaluate a stand-alone GMP alternative, as it would not meet the purpose and need of the plan and the requirements of the WSRA. In addition, the GMP does not include necessary actions to protect and enhance river values, address user capacity issues, or remove facilities that are not essential or necessary under WSRA. The *Merced River Plan/DEIS* will amend the GMP to meet the requirements of WSRA, the Secretarial Guidelines, and the legal record. In the future, the Tuolumne River Plan and the Wilderness Stewardship Plan are expected to amend additional portions of the GMP. The NPS plans to prepare a comprehensive document integrating recent amendments to the GMP, after the respective Record of Decisions are signed.

## Interrelationships with other Plans and Projects

In addition to the complex legal framework of the *Merced River Plan/DEIS*, the following Yosemite-specific plans play a role in the planning framework.

- ***Concession Services Plan (1992)***. This plan supplements the 1980 *General Management Plan for Yosemite National Park*. Revisions to certain concession services action items of the General Management Plan are described, and the environmental consequences of those items are evaluated. The final plan reduced overall lodging, replaced lodging at Yosemite Lodge with economy cabins and cottages rather than motel units, retained 150 tent cabins at Curry Village (rather than 100), and increased food service seats, among other actions.

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<sup>2</sup> *Friends of Yosemite v. Kempthorne*, 520 F.3d 1024, 1035-36 (Ninth Circuit, 2008) [hereafter *FYVIII*].

- ***Fire Management Plan (2004)***. This plan guides a complex fire management program, which oversees wildland fire suppression, wildland fire used to achieve natural and cultural resource benefits, fire prevention, prescribed fire, fire ecology research, and the use of mechanical methods to reduce and thin vegetation in and around communities. Actions prescribed in the *Fire Management Plan* will help achieve natural resource goals of the *Merced River Plan/DEIS*.
- ***Scenic Vista Management Plan (2010)***. This plan describes a program to document, protect, re-establish, and maintain Yosemite's important viewpoints that is consistent with the natural processes and human influences that created them. The plan is adopted for the viewpoints within the Merced River corridor, but the analysis and specific actions related to those viewpoints would be directed by the *Merced River Plan/Final EIS*.
- ***Invasive Plant Management Plan Update (2011)***. This plan updates the 2008 *Invasive Plant Management Plan* to create a more comprehensive and adaptive plan for protecting Yosemite's natural and cultural resources from non-native, invasive plants. This plan may be amended when the Tuolumne River and Merced river plans are completed.
- ***Ahwahnee Comprehensive Rehabilitation Plan (2012)***. This plan brings The Ahwahnee into compliance with the California Historical Building Code (2010), improves operational efficiencies, enhances visitor experience, and protects and preserves the historic integrity of this National Historic Landmark. The Ahwahnee is within the Merced River corridor, and proposed rehabilitation of the cultural landscape at The Ahwahnee is largely deferred to future site planning efforts, pending finalization of the *Merced River Plan/DEIS*.
- ***Curry Village Rock-Fall Hazard Zone Structures Plan (2012)***. This plan re-aligns the boundary of the previous rock-fall hazard zone in Curry Village in response to recent scientific inquiry. To reduce rock-fall risk, the NPS closed or repurposed structures within the updated rock-fall hazard zone.
- ***Yosemite Wilderness Management Plan (1989)***. The Yosemite Wilderness was established by the California Wilderness Act of 1984. The Committee Report accompanying the 1984 act contains recommendations for managing Yosemite Wilderness regarding operational and environmental impacts. The *Yosemite Wilderness Management Plan* responded to those recommendations in addition to a number of objectives identified through condition reports and other research. The objectives of the *Yosemite Wilderness Management Plan* that pertain to the *Merced River Plan* regard: 1) Human-Induced Change: NPS will impose limits on human-induced change and will establish maximum use levels and quotas to accomplish this objective. 2) Wilderness Experience: Visitors can find a variety of wilderness experiences in keeping with traditional use patterns and select the degree of crowding, solitude, and human impact they wish to experience. 3) Wilderness Values: NPS will provide educational and interpretive media and programs to facilitate greater understanding and appreciation of wilderness values and to help visitors minimize resource impacts. 4) Wilderness Facilities: Facilities, including safety railings, in Yosemite wilderness will be limited to those currently present or specifically proposed in this plan. Further facilities would compromise NPS responsibilities in wilderness management.
- ***Yosemite Wilderness Stewardship Plan (n progress)***. This plan is in the early stages of data collection, and public scoping has not commenced. Decisions made in the *Merced River Plan/DEIS* regarding wilderness values, wilderness facilities, use limits, designated camping areas, the Merced Lake High Sierra Camp, and restoration activities may be revisited in the forthcoming Yosemite Wilderness Stewardship Plan as part of the park's overall wilderness planning effort. The *Merced River Plan/DEIS* will not constrain the range of alternatives to be considered in the wilderness stewardship plan, and Wilderness Stewardship Plan decisions may supersede those made in the Merced River Plan. Stewardship strategies developed for the wilderness plan may affect day and overnight use of other trails that lead to the Merced River corridor. Such changes could, in turn, affect use levels. Any such changes would be evaluated comprehensively in the Yosemite Wilderness Stewardship Plan.

- ***Tuolumne Wild and Scenic River Comprehensive Management Plan (in progress)***. The NPS is preparing a comprehensive management plan for the Tuolumne River in Yosemite, designated as a Wild and Scenic River in 1984. The NPS expects the *Tuolumne Wild and Scenic River Comprehensive Management Plan/Draft Environmental Impact Statement* to be released about the same time as the *Merced River Plan/DEIS*. While the two river corridors do not overlap, these two plans have a similar approach and organization.
- ***Mariposa Grove of Giant Sequoias Restoration Plan (in progress)***. The Mariposa Grove of Giant Sequoias lies outside the Merced River corridor, but some visitor parking and transit facilities that serve the Mariposa Grove are located in the river corridor in Wawona. Decisions in the *Merced River Plan/DEIS* concerning land uses in Wawona would influence the span of decisions made during the Mariposa Grove planning process.
- ***Half Dome Trail Stewardship Plan (in progress)***. The purpose of this plan is to respond to an urgent need to address safety and wilderness character on the Half Dome trail. Visitor safety and Wilderness resource protection are necessary for the management of park operations. While the project area of the Half Dome Trail Stewardship Plan is well outside of the Merced River corridor, the establishment and management of use standards on the Half Dome trail may affect use patterns along trails in the river corridor between Happy Isles and Little Yosemite Valley. The user-capacity management for Wilderness areas in the Merced River corridors may affect day and overnight use of trails that access Half Dome. *The Half Dome Trail Stewardship Plan* would be amended if the river plans determine that protection and enhancement of river values requires adjustments to the use of the Half Dome trail.

“Cumulative Actions” (Appendix B) describes additional plans related to the *Merced River Plan/DEIS*.

## Comprehensive Wild and Scenic River Management Plan Requirements

WSRA and the Secretarial Guidelines direct managing agencies to develop a Comprehensive Wild and Scenic River Management Plan for each designated river. Table 2-1 displays the specific elements included in the *Merced River Plan/DEIS* that encompass the Comprehensive Wild and Scenic River Management Plan (Figure 1-2). These elements include those mandated in WSRA, the Secretarial Guidelines, and recommendations of the Interagency Wild and Scenic Rivers Coordinating Council (referred to as the Interagency Council from this point). The Interagency Council is not a decision-making body, rather its goal is to improve interagency coordination in administering WSRA, improving service to the American public and enhancing protection of important river resources. The Interagency Council recommends inclusion of the following key components in a comprehensive river management plan (Interagency Council 2010):

- A description of resource conditions including detailed description of river values (free-flowing condition, water quality, and ORVs)
- Goals and desired conditions to protect a river’s free-flowing condition, water quality, and ORVs
- Direction for visitor use and capacity management
- A framework for future development and activities on federal lands in the river corridor
- A monitoring strategy specifically related to protecting the river’s free-flowing condition, water quality, and ORVs



**TABLE 2-1: ELEMENTS OF THE COMPREHENSIVE WILD AND SCENIC RIVER MANAGEMENT PLAN**

Objective	Primary Reference <sup>1</sup>	Chapter in the Draft Merced River Plan/DEIS
Document river boundaries and classify river segments as wild, scenic, or recreational	<ul style="list-style-type: none"> <li>• Wild and Scenic Rivers Act (Section 3 [d])</li> <li>• Secretaries' Guidelines (Section II)</li> </ul>	Chapter 3: Merced Wild and Scenic Boundaries and Segment Classifications
Provide a clear process for protection of the river's free-flowing condition in keeping with Section 7 of the Wild and Scenic Rivers Act	<ul style="list-style-type: none"> <li>• Wild and Scenic Rivers Act (Section 7)</li> </ul>	Chapter 4: Section 7 of the Wild and Scenic River Act – Determination Process for Water Resources Projects
Clearly describe the river's outstandingly remarkable values (ORVs), which are the unique, rare, or exemplary river-related characteristics that make the river eligible for inclusion in the National Wild and Scenic Rivers System	<ul style="list-style-type: none"> <li>• Wild and Scenic Rivers Act (Section 3[d])</li> <li>• Interagency Council (2010)</li> </ul>	Chapter 5: River Values and Their Management
Establish a management program to protect and enhance the river's outstandingly remarkable values, free-flowing condition, and water quality	<ul style="list-style-type: none"> <li>• Wild and Scenic Rivers Act (Section 3[d])</li> <li>• Secretarial Guidelines (Section III)</li> <li>• Interagency Council (2010)</li> </ul>	Chapter 5: River Values and Their Management
Determine the type and location of lands and facilities (both current and future) that provide for public use while protecting and enhancing river values	<ul style="list-style-type: none"> <li>• Wild and Scenic Rivers Act (Section 3[d])</li> <li>• Secretarial Guidelines (Section III)</li> </ul>	Chapter 5: River Values and Their Management (Existing Facilities Analysis) Chapter 6: Visitor Use and User Capacity Chapter 8: Alternatives
Address user capacities; determine the quantity and mixture of recreation types and other public uses that can be allowed without causing adverse effects or degradation of river values	<ul style="list-style-type: none"> <li>• Wild and Scenic Rivers Act (Section 3[d])</li> <li>• Secretarial Guidelines (Section III)</li> <li>• Interagency Council (2010)</li> </ul>	Chapter 6: Visitor Use and User Capacity (Note that user capacity determinations build on information in Chapter 5) Chapter 7: Facilities and Services Analysis Chapter 8: Alternatives
<sup>1</sup> Secretarial Guidelines – <i>National Wild and Scenic Rivers System: Final Revised Guidelines for Eligibility, Classification and Management of River Areas</i> ; Interagency Council – Interagency Wild and Scenic Rivers Coordinating Council		

## IDENTIFICATION OF PLANNING ISSUES: PUBLIC AND INTERNAL SCOPING

The NPS sought to understand and consider input from the public, NPS staff, subject-matter experts, culturally-associated American Indian tribes, and other federal, state, and local agencies, as part of an extensive public planning process for the *Merced River Plan/DEIS*. The NPS conducted an open process, referred to as “scoping,” to identify and determine the scope of issues to be addressed in the environmental analysis.

During public scoping periods, the NPS collected written comments and conducted public workshops. The NPS considered 1,464 correspondences received since 2007 as part of this current planning process, as well as those received during earlier iterations of the Merced River Plan (see “Legal History” section in this chapter). Public workshops provide an opportunity for the public, the NPS planning team, and subject-matter experts to interact. Since 2007, the NPS has held approximately 40 Merced River Plan public workshops or webinars related to the *Merced River Plan/DEIS*:

- 2007 Public Scoping (three public meetings or webinars)
- 2009 Public Scoping (10 public meetings or webinars)
- 2010 ORV Interim Public Comment Period (seven public meetings or webinars)

- 2011 Baseline conditions report interim public comment period (six public meetings or webinars)
- 2011 alternative development workshop interim public comment period (six public meetings or webinars)
- 2012 preliminary alternative concepts workshops (six public meetings or webinars)

The NPS will continue facilitating workshops throughout the development of the final *Merced River Plan/EIS*. “Consultation and Coordination” (Chapter 10) includes a complete list of public meetings to date and more detail on the plan’s scoping process.

Internal scoping, including consultation with culturally associated tribes, other public agencies, and park staff, began with a comprehensive review of the river’s outstandingly remarkable values, and continued through development of this draft plan. The interests and concerns of the tribes and other government agencies will continue to be gathered concurrently with the general public process throughout the development of the final plan.

## Issues and Opportunities to be Addressed in the ‘Merced River Plan/DEIS’

The NPS analyzed public comments submitted in the period from 2007 to 2012 to assist with identification of issues and opportunities to be addressed in the *Merced River Plan/DEIS*. Throughout this time, the internal planning process generated additional issues and opportunities. Table 2-2 lists the issues and opportunities identified during this period. The NPS integrated the issues, opportunities, and associated actions into a range of alternatives. In general, the *Merced River Plan/DEIS* addresses issues that would protect and enhance river values; facilitate appropriate visitor use and associated user capacity in the river corridor; and determine appropriate types, sizes, and suitable locations of facilities needed to support visitor use. Issues considered outside the scope of this plan are described in the “Issues Beyond the Scope and Direction of this Plan” section in this chapter (see Table 2-3).

**TABLE 2-2: ISSUES IDENTIFIED IN PUBLIC SCOPING**

General Planning Issues
<b>General</b> <ul style="list-style-type: none"> <li>• The NPS should detail the specifics of project components, such as the types of campgrounds or the location of road alignments.</li> <li>• The NPS should conduct formal consultation on the Merced River Plan/DEIS with American Indian tribes who claim traditional association with Yosemite National Park.</li> </ul>
Actions to Protect and Enhance River Values
<b>General Restoration</b> <ul style="list-style-type: none"> <li>• The NPS should prioritize protection and enhancement of resource-based river values over recreational values.</li> <li>• The NPS should not ecologically restore the Merced River corridor to a static snapshot but should protect a dynamic ecological system.</li> <li>• The NPS should consider the ecological impacts of removing facilities in the river corridor.</li> <li>• The NPS should use a 150-foot riparian buffer for all infrastructure, rather than the 100-year floodplain.</li> </ul> <b>Biological</b> <ul style="list-style-type: none"> <li>• The NPS should restore the ecological function of Yosemite Valley meadows.</li> <li>• The NPS should partially restore Yosemite Village Day-use Parking Area (Camp 6) to natural conditions.</li> <li>• The NPS should manage conifers in Yosemite Valley to restore views and the ecological function of meadows.</li> </ul>

**TABLE 2-2: ISSUES IDENTIFIED IN PUBLIC SCOPING**

Actions to Protect and Enhance River Values (continued)
<ul style="list-style-type: none"> <li>• The NPS should examine the impacts of stock use on non-native plant dispersal, water quality, birds, native vegetation, and the visitor experience.</li> <li>• The NPS should consider additional mitigation measures for continued use of stock animals.</li> <li>• The NPS should map critical habitat for recovery of special-status wildlife species and address actions to protect and enhance this habitat.</li> <li>• The NPS should remove parking at the El Portal Administrative Site from sensitive areas.</li> <li>• The NPS should designate river access points and direct visitor use to resilient beach locations.</li> <li>• The NPS should allow roadside parking on edges of meadows, with fencing to protect meadow resources.</li> </ul>
<p><b>Hydrology/Geology/Free-Flowing Condition/Water Quality</b></p> <ul style="list-style-type: none"> <li>• The NPS should restore riverbanks by removing riprap and restoring riparian vegetation.</li> <li>• The NPS should remove Sugar Pine, Ahwahnee, and Stoneman bridges to protect and enhance the free-flowing condition of the river.</li> <li>• The NPS should not remove the historic bridges as they provide opportunities for scenic viewing that is protective of other river values.</li> <li>• The NPS should consider the use of holding panels to protect bridges and river flow with openings, arches, or culverts to accommodate high flow without causing additional impacts to free-flowing condition.</li> <li>• The NPS should reduce the number of units at Housekeeping Camp to protect the river.</li> <li>• The NPS should remove or relocate campsites that are too close to the river, so as to protect riparian habitat.</li> <li>• The NPS should consider the full effects of adding remote parking in El Portal, including the impact on the river.</li> <li>• The NPS should remove unnecessary, abandoned, or inappropriate infrastructure, such as the Greenemeyer sand pit, and allow site restoration.</li> </ul>
<p><b>Scenic and Cultural Resources</b></p> <ul style="list-style-type: none"> <li>• The NPS should identify goals, measurable objectives, and management prescriptions that explain specifically how the agency will define, protect, and enhance the cultural outstandingly remarkable value (ORV).</li> <li>• The NPS should retain historic bridges due to their important cultural value and their ability to provide for traffic flow on peak days in Yosemite Valley.</li> <li>• The NPS should adequately define and collaboratively monitor the ethnographic component of the cultural ORV in Yosemite Valley.</li> <li>• The NPS should protect and enhance traditional cultural resources (including archeological sites, scenic resources, and natural resources with traditional cultural uses) that represent a continuum of cultural heritage connecting contemporary people to the archeological sites of their ancestors in the park.</li> <li>• The NPS should consider removing the abandoned sewage treatment plant at El Portal but take measures to protect the prehistoric burials in the area and consult with traditionally associated American Indians.</li> <li>• The NPS should protect archeological resources by removing infrastructure and visitor uses from sensitive areas.</li> </ul>
User Capacity, Land Use and Facilities Management
<p><b>Facilities and Services</b></p> <ul style="list-style-type: none"> <li>• The NPS should clearly explain the process for analyzing major facilities in the river corridor.</li> <li>• The NPS should remove/relocate obsolete or unnecessary infrastructure.</li> <li>• The NPS should not reduce facilities with the assumption that the removal benefits the majority of people. The NPS should first identify appropriate visitor facilities and services necessary for the protection and enhancement of ORVs before determining transportation, user capacity, and parking requirements.</li> <li>• The NPS should not remove facilities, such as the Wawona Golf Course, if they are located outside the WSRA corridor and the 100-year floodplain.</li> <li>• The NPS should not remove, relocate, or re-design facilities, services, or activities that do not have a direct or indirect adverse effect on river values.</li> <li>• The NPS should not develop visitor facilities in the west end of Yosemite Valley because development should be concentrated in the east end of the Valley.</li> </ul>

**TABLE 2-2: ISSUES IDENTIFIED IN PUBLIC SCOPING**

User Capacity, Land Use and Facilities Management (continued)
<ul style="list-style-type: none"> <li>• The NPS should establish a limit for or reduce the amount of rafts on the river.</li> <li>• The NPS should allow year-round paddling on all sections of the Merced River, including the South Fork.</li> <li>• The NPS should provide more picnic areas in developed areas of the park.</li> <li>• The NPS should end use of commercial day rides within Yosemite Valley and close the commercial stables.</li> <li>• The NPS should remove or reduce hiker-stock conflicts on trails.</li> <li>• The NPS should continue to allow horseback riding in the Merced River corridor.</li> <li>• The NPS should continue stock support for trail maintenance.</li> <li>• The NPS should maintain the Wawona Impoundment to supply water to the Wawona community.</li> <li>• The NPS should consider development of camping, housing, office space, and parking in El Portal.</li> <li>• The NPS should not consider construction of administrative facilities in Section 35 in Wawona.</li> <li>• The NPS should improve access for people with disabilities.</li> </ul> <p><b>Visitor Overnight Services (Campgrounds and Lodging)</b></p> <ul style="list-style-type: none"> <li>• The NPS should maintain or increase the number of campsites in Yosemite Valley.</li> <li>• The NPS should develop increase and improve high-density walk-in camping, such as Camp 4, to reduce the sprawling nature of traditional campgrounds and their associated impacts to the natural landscape.</li> <li>• The NPS should not decrease the capacity of Yosemite Valley's Backpackers Campground.</li> <li>• The NPS should segregate camping by type (RV, tent, and walk-in campgrounds) to support each person's camping experience to the fullest.</li> <li>• The NPS should reduce campsites within the park and not rebuild those lost in the 1997 flood.</li> <li>• The NPS should not develop additional campgrounds west of Yosemite Lodge in Yosemite Valley.</li> <li>• The NPS should restore Upper and Lower River Campgrounds to natural conditions.</li> <li>• The NPS should replace the concessioner stables area in Yosemite Valley with additional camping.</li> <li>• The NPS should consider developing more group campgrounds in Yosemite Valley.</li> <li>• The NPS should increase camping and decrease lodging to improve access for lower-income families and to reduce the operational needs.</li> <li>• The NPS should not remove Yosemite Lodge or re-purpose the area as camping because it provides a mid-priced lodging opportunity.</li> <li>• The NPS should not reduce visitor lodging capacity in the park due to the loss of transient occupancy taxes for Mariposa County.</li> <li>• The NPS should remove the High Sierra Camps and restore the site.</li> <li>• The NPS should retain the High Sierra Camps at their current capacity.</li> <li>• The NPS should reduce the capacity of the Merced Lake High Sierra Camp.</li> <li>• The Merced Lake High Sierra Camp should be managed to protect its historic value.</li> </ul> <p><b>Housing</b></p> <ul style="list-style-type: none"> <li>• The NPS should remove employee housing complexes that are at risk from rock falls.</li> <li>• The NPS should consider negative impacts on El Portal's limited infrastructure, services, and community atmosphere before building high-density housing for concession employees.</li> </ul> <p><b>Transportation</b></p> <ul style="list-style-type: none"> <li>• The NPS should articulate how current and proposed transportation strategies affect ORVs.</li> <li>• The NPS should support private vehicle access to Yosemite Valley because it is more sustainable than out-of-park public transportation.</li> <li>• The NPS should encourage alternative transportation.</li> <li>• The NPS should not switch to a shuttle-only transportation system.</li> <li>• The NPS should implement a system to allow pedestrians to cross the road safely and not impede traffic.</li> </ul> <p>The NPS should construct pedestrian underpasses and roundabouts to improve traffic flow in Yosemite Valley.</p>

**TABLE 2-2: ISSUES IDENTIFIED IN PUBLIC SCOPING**

User Capacity, Land Use and Facilities Management (continued)
<ul style="list-style-type: none"> <li>• The NPS should consider an East Yosemite Valley day-use parking permit system.</li> <li>• The NPS should not construct pedestrian underpasses or roundabouts.</li> <li>• The NPS should use other transportation management tools before using a day-use parking permit system.</li> <li>• The NPS should develop parking in West Yosemite Valley.</li> <li>• The NPS should use real-time data to educate the visitor on the number of private vehicles allowed on a daily basis during the summer peak period.</li> <li>• The NPS should expand shuttle service between Wawona and other park locations.</li> <li>• The NPS should provide areas other than the Wawona Store for buses to park.</li> <li>• The NPS should develop remote parking lots outside of Yosemite Valley.</li> <li>• The NPS should develop additional employee parking at the El Portal Warehouse.</li> </ul> <p><b>Visitor Experience and User Capacity</b></p> <ul style="list-style-type: none"> <li>• The NPS should clearly define how user capacity will be determined.</li> <li>• The NPS should consider the impact of seasonal and location differences when evaluating user capacity.</li> <li>• The NPS should enforce user capacity to enhance the visitor experience and effectively protect resources.</li> <li>• The NPS should consider the socioeconomic impact of user capacity on surrounding gateway communities.</li> <li>• The NPS should establish a monitoring plan to ensure the effectiveness of use limits.</li> <li>• The NPS should maximize the use of the Merced River corridor as a recreational attraction and enable full accommodation of increased levels and intensities of visitor use.</li> <li>• The NPS should regulate access to sensitive areas within the park.</li> <li>• The NPS should not limit access to the park.</li> <li>• The NPS should establish user capacity based on vehicles rather than individual park visitors.</li> <li>• The NPS should not increase visitation because this would adversely affect the recreational ORV due to additional crowding and congestion at specific visitor-use areas.</li> <li>• The NPS should address how day use in Wilderness areas affects high-encounter rates and impacts to wilderness character.</li> <li>• The NPS should reduce the trailhead quotas for Wilderness areas to improve the wilderness experience.</li> </ul>

## Issues beyond the Scope and Direction of this Plan

This section describes the issues raised during public scoping and workshops that the NPS considered outside the scope and direction of the *Merced River Plan/DEIS*. “Alternatives” (Chapter 8) describes additional actions that were considered but dismissed in the plan. The NPS removed issues from consideration if they were:

- Outside the scope of the plan
- Already decided by law, regulation, or other higher-level decision
- Not relevant to the decision to be made
- Missing a valid cause and effect relationship
- Associated with small effects relative to the decision to be made
- Conjectural and not supported by scientific or factual evidence
- Unreasonable or infeasible because they would be cost prohibitive, violate law or policy, or contribute to other resource concerns or hazards

- Inconsistent with the facilities and services analysis criteria (See Chapter 7)

The following issues were considered beyond the scope and direction of the *Merced River Plan/DEIS*:

**TABLE 2-3: ISSUES IDENTIFIED IN PUBLIC SCOPING BEYOND THE SCOPE OF THE 'MERCED RIVER PLAN/DEIS'**

Actions to Protect and Enhance River Values	
<ul style="list-style-type: none"> <li>• The NPS should design "smokeless campsites" with no fire rings in a portion of all Valley campgrounds to enhance the visitor experience for people with aversions to campfire smoke.</li> <li>• The NPS should eliminate roadside parking from El Capitan Meadow to enhance views and protect the meadow.</li> <li>• The NPS should allow roadside parking on the edges of meadows, which can be fenced to protect meadow resources.</li> <li>• The NPS should develop seasonal campgrounds in areas that are known to flood annually.</li> <li>• The NPS should increase development in Wilderness areas.</li> <li>• The NPS should change the Wilderness boundaries within Yosemite.</li> <li>• The NPS should consider altering the bridges over the Merced River to accommodate peak flood events and to correct unnatural widening of the river channel.</li> </ul>	
User Capacity, Land Use and Facilities Management	
<p><b>Facilities and Services</b></p> <ul style="list-style-type: none"> <li>• The NPS should develop more trails and other recreation opportunities throughout the park to disperse visitor use.</li> <li>• The NPS should consider moving administrative offices out of Yosemite Valley to El Portal or Mariposa.</li> <li>• The NPS should locate the concessioner general offices and the NPS administrative offices together, whether in Yosemite Valley, El Portal, or Mariposa, to maximize collaboration.</li> <li>• The NPS should not remove the Curry Village ice rink, Happy Isles snack stand, or Yosemite Lodge and Ahwahnee pools.</li> <li>• The NPS should encourage bicycle use through a non-profit bicycle exchange or park-run operation offering reasonable prices.</li> <li>• The NPS should not issue special-use permits for large, private events.</li> </ul> <p><b>Visitor Overnight Services (Campgrounds and Lodging)</b></p> <ul style="list-style-type: none"> <li>• The NPS should develop additional campgrounds outside of the river corridor.</li> <li>• The NPS should implement a tiered camping fee structure for its premium campsites.</li> </ul> <p><b>Transportation</b></p> <ul style="list-style-type: none"> <li>• The NPS should construct a remote parking area and visitor center in Foresta.</li> <li>• The NPS should increase the frequency and expand shuttle service between Yosemite Valley, Glacier Point, and Mariposa Grove.</li> <li>• The NPS should partner with local communities to develop remote transit centers and expanded public transportation.</li> </ul> <p><b>Visitor Experience and User Capacity</b></p> <ul style="list-style-type: none"> <li>• The NPS should manage permit and reservation systems that cannot be abused by speculative buyers and scalping.</li> <li>• The NPS should encourage the use of the larger Sierra Nevada environment surrounding Yosemite.</li> <li>• The NPS should address recreational opportunities that are accessed in the Merced River corridor, such as climbing, but do not necessarily occur in the river corridor.</li> </ul>	

### 3. MERCED WILD AND SCENIC RIVER BOUNDARIES AND SEGMENT CLASSIFICATIONS

#### RIVER CORRIDOR BOUNDARIES

The Wild and Scenic Rivers Act (WSRA) requires federal agencies to establish legal boundaries for each federally administered river in the National Wild and Scenic Rivers System. The boundary for a Wild and Scenic River establishes the area that will receive the greatest resource protection efforts. In accordance with WSRA (section 3[b]), boundaries may include an average of not more than 320 acres of land per mile, measured from the ordinary high-water mark<sup>3</sup> on both sides of the river. The National Park Service (NPS) used U.S. Geological Survey 7.5-inch topographic quadrangle data to calculate a Wild and Scenic River corridor boundary that encompasses all land within a quarter-mile of the ordinary high-water mark of the Merced River, the maximum area allowed under WSRA<sup>4</sup>. This includes the land below the ordinary high-water mark, which is not included in the acreage limitation. The NPS applies this boundary consistently to the Merced River in Yosemite National Park and the El Portal Administrative Site, including the main stem Merced River, South Fork Merced River, Red Peak Fork, Merced Peak Fork, Triple Peak Fork, and Lyell Fork tributaries.

The NPS presented and refined the boundaries and classifications of the Merced Wild and Scenic River throughout the legal and planning history of the Wild and Scenic River. Early in the litigation over the Merced River Plan, some of the segment classifications were challenged in court. These challenges were reflected by the courts, and the segment classifications have remained consistent over time. However in 2003, the U.S. Court of Appeals for the Ninth Circuit ruled that the 2000 *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement* was deficient with regard to the river boundary in the El Portal segment, which was delineated as the 100-year floodplain along with adjacent wetlands, or a 100-foot buffer from the ordinary high-water mark, whichever was greater. The court found that this river corridor did not fully account for the location of river values in the area, and directed the NPS to “reevaluate the river corridor boundary based on the precise location of outstandingly remarkable values.”

The 2005 *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement* revised the corridor boundary in El Portal to include all land within a quarter-mile of each side of the river, consistent with the rest of the river corridor. This *Merced Wild and Scenic River Comprehensive Management Plan/Draft Environmental Impact Statement* (Merced River Plan/DEIS) establishes the same river corridor boundary for the Merced Wild and Scenic River that encompasses a quarter-mile of land measured from each side of the river’s ordinary high-water mark throughout all segments of the river (Figure 3-1). This action is common to all alternatives proposed in this plan.

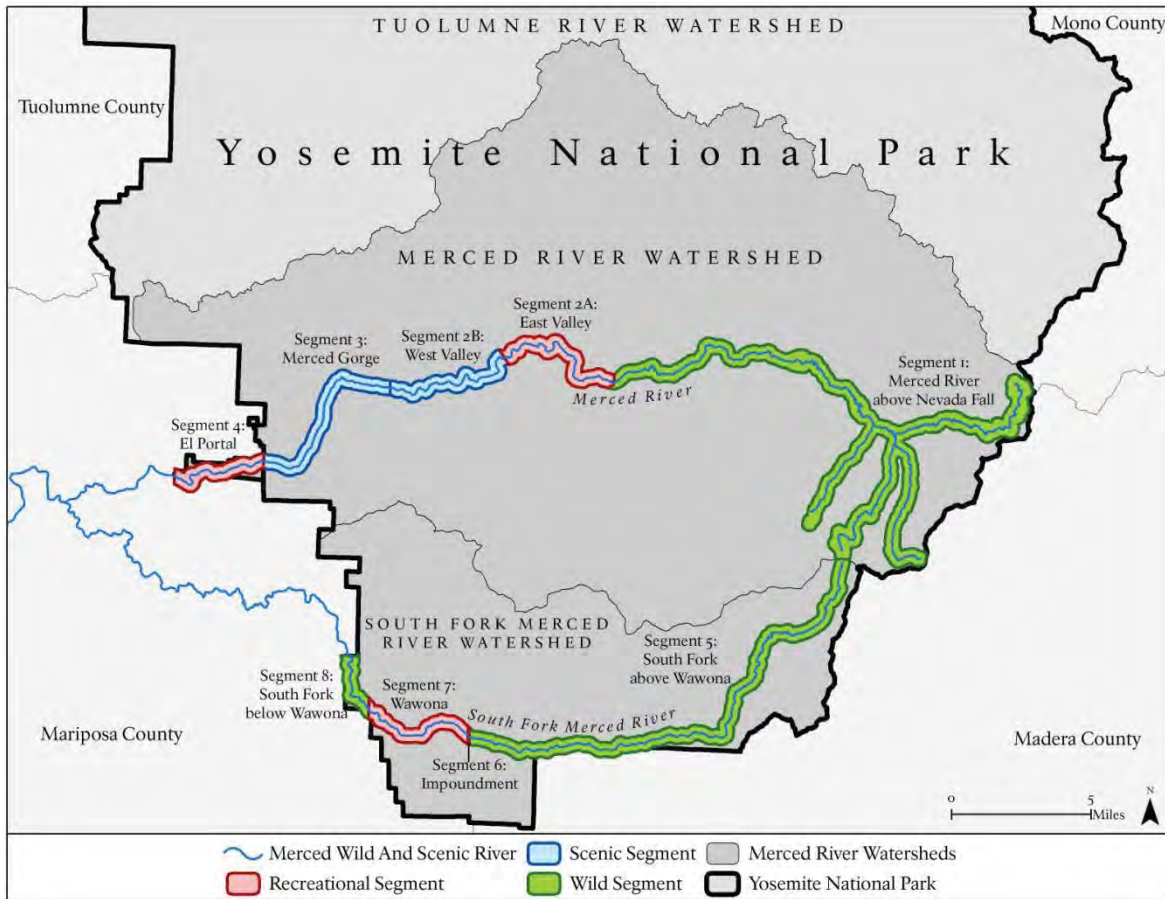
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<sup>3</sup> The U.S. Army Corps of Engineers defines the ordinary high water mark as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

<sup>4</sup> This acreage designation does not limit the protection of river values, which must be protected whether they are inside or outside the corridor boundary.



**Figure 3-1: Merced Wild and Scenic River Segment Boundaries and Classifications**



## WILD AND SCENIC RIVER CLASSIFICATIONS

WSRA (section 2 [b]) directs managing agencies to classify and administer designated rivers as one of the following, depending on the type and intensity of development:

**Wild:** Rivers or sections of rivers that are free of impoundment and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and water unpolluted. These represent vestiges of primitive America.

**Scenic:** Rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

**Recreational:** Rivers or sections of rivers readily accessible by road or railroad, may have some development along their shorelines, and may have undergone some impoundment or diversion in the past.

A Wild and Scenic River may be divided into segments to aid in classification (DOI 1982). This plan divides the Merced River into segments, and classifies each segment as *Wild*, *Scenic*, or *Recreational* as portrayed in Figure 3-1 and Table 3-1. This classification system is common to all alternatives proposed in this plan. If the NPS removes the Wawona Impoundment from the river channel at some time in the future, Segment 6



would be reclassified as Scenic, based on the change in the level of development and enhancement of the river's free-flowing condition.

The classification of a river segment provides a general framework for the type and intensity of land management activities that may take place in the future (IWSRCC 2002). A comprehensive management plan may allow different levels of use and development based on how a segment is classified. The classifications of each river segment guide the range of actions proposed in this plan. All proposed actions were analyzed to ensure they are compatible with the classification for each river segment.

**TABLE 3-1: SEGMENT CLASSIFICATIONS FOR THE MERCED WILD AND SCENIC RIVER**

Segment	Classification	Location
1	Wild	Merced River Above Nevada Fall
2A	Recreational	East Yosemite Valley: Top of Nevada Fall to Sentinel Beach
2B	Scenic	West Yosemite Valley: Sentinel Beach to junction of El Portal Road and Big Oak Flat Road
3	Scenic	Merced Gorge: Junction of El Portal and Big Oak Flat Roads to western Yosemite National Park boundary at parkline
4	Recreational	El Portal: Western Yosemite National Park boundary at parkline to El Portal Administrative Site boundary
5	Wild	South Fork Merced River Above Wawona: Headwaters to top of pool at Wawona Impoundment
6	Recreational	Wawona Impoundment: Top of pool at Wawona Impoundment to 200 feet below dam
7	Recreational	Wawona: 200 feet below Wawona Impoundment to Squirrel Creek
8	Wild	South Fork Merced River Below Wawona: Squirrel Creek to western park boundary

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## 4. SECTION 7 OF THE WILD AND SCENIC RIVERS ACT – DETERMINATION PROCESS FOR WATER RESOURCES PROJECTS

The U.S. Congress enacted the Wild and Scenic Rivers Act (WSRA) in 1968 to end decades of damming, dredging, and diversion of some of the nation’s most spectacular waterways. Section 7(a) is a key provision of WSRA that directs federal agencies to protect the free-flowing condition, water quality, and outstandingly remarkable values (ORVs) of designated Wild and Scenic Rivers. Section 7 requires a rigorous and consistent interagency process for protecting river resources. This chapter describes the process used to protect the free-flowing condition of the Merced River when a proposed *water resources project* triggers a review and determination under section 7 of WSRA. *Water resources projects* include, but are not limited to, dams, water diversion projects, fisheries habitat and watershed restoration/enhancement projects, bridge and other roadway construction/ reconstruction projects, bank stabilization projects, channelization projects, levee construction, recreation facilities such as boat ramps and fishing piers, and activities that require a section 404 permit from the U.S. Army Corps of Engineers<sup>5</sup>.

While no new dams will be proposed on the Merced River in the future due to its status as a Wild and Scenic River, other potential water resources projects along the Merced Wild and Scenic River could be proposed, including projects with the purpose of improving the free-flowing condition of the river or enhancing a particular outstandingly remarkable value. The National Park Service (NPS) will conduct a “Section 7 Determination Process” as described in the next section of this chapter for all proposed projects that require review under section 7 of WSRA. Any proposed project that meets the following conditions must undergo an initial review, as depicted in Table 4-1, to confirm whether the proposed project is subject to the Section 7 Determination process:

- Proposed projects in the bed or banks of the Merced River, or
- Proposed projects in the bed or banks of a river located above, below, or on a stream tributary to the Merced River



The next section in this chapter describes the “Section 7 Determination Process.”

The NPS will conduct the Section 7 Determination process for the preferred alternative in the final Merced River Plan, and the analysis and determination will be included in the Record of Decision for the plan.

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<sup>5</sup> Section 404 of the Clean Water Act requires that a permit is obtained from the U.S. Army Corps of Engineers, prior to beginning any non-exempt activity involving the placement of dredged or fill material in waters of the United States, including wetlands.

**TABLE 4-1: DETERMINING THE NEED FOR A SECTION 7 DETERMINATION UNDER WSRA**

When is a Determination under Section 7 of the Wild and Scenic Rivers Act Required?	
<p style="text-align: center;"><b>IF</b></p> <ul style="list-style-type: none"> <li>The project is proposed in the bed or banks of a designated river or congressionally authorized study river</li> </ul> <p style="text-align: center;"><b>AND</b></p> <ul style="list-style-type: none"> <li>The project is proposed by a federal agency or it requires some type of federal assistance such as a permit, license, grant, or loan</li> </ul> <p style="text-align: center;"><b>THEN</b></p> <p style="text-align: center;"></p> <p><b>A Section 7 Determination is required under when both of the above conditions exist.</b></p>	<p style="text-align: center;"><b>IF</b></p> <ul style="list-style-type: none"> <li>The project is proposed in the bed or banks of a river below, above, or on a stream tributary to a designated river or congressionally authorized study river</li> </ul> <p style="text-align: center;"><b>AND</b></p> <ul style="list-style-type: none"> <li>The project is proposed by a federal agency or it requires some type of federal assistance such as a permit, license, grant, or loan</li> </ul> <p style="text-align: center;"><b>AND</b></p> <ul style="list-style-type: none"> <li>The project is likely to result in effects within a designated river or congressionally authorized study river</li> </ul> <p style="text-align: center;"><b>THEN</b></p> <p style="text-align: center;"></p> <p><b>A Section 7 Determination is required under when all of the above conditions exist.</b></p>

## THE SECTION 7 DETERMINATION PROCESS

Any federally assisted water resources project that would have a “direct and adverse effect” on the values for which a river was added to the Wild and Scenic Rivers System is prohibited. The NPS is responsible for making the final determination as to whether a proposed water resources project would have a direct and adverse effect on river values in the portion of the Merced River within Yosemite. The NPS must coordinate the Section 7 Determination process with other agencies that are required to review and comment on the project. Depending on the type and location of the project, such agencies might include the U.S. Fish and Wildlife Service, the Environmental Protection Agency, the U.S. Forest Service, the Bureau of Land Management, and the U.S. Army Corps of Engineers. “Consultation and Coordination” (Chapter 10) provides specific information on NPS consultation with other agencies. Review of projects subject to Section 7 of WSRA will also be coordinated with other environmental review processes as appropriate, such as those required by NEPA and the National Historic Preservation Act (NHPA). In accordance with WSRA, potential water resources projects that could have a direct and adverse effect on the values of a designated river must be: (1) redesigned and resubmitted for a subsequent Section 7 Determination, (2) abandoned, or (3) reported to the Secretary of the Interior and Congress.

### Federal Projects Below, Above, or on Tributaries of a Wild and Scenic River

Proposed non-hydroelectric projects with federal assistance that would take place below, above, or on the tributaries of a Wild and Scenic River have a slightly different evaluation standard than projects proposed directly in the bed and banks of a Wild and Scenic River. These projects must not “invade the area or unreasonably diminish” wild and scenic river values. Typical projects that meet this definition are water

resources projects that would be visible from the designated river, dams, and upstream diversion structures, because such projects have the potential to affect scenic, recreational, and fish or wildlife values in the designated river.

## Steps in the Wild and Scenic Rivers Act Section 7 Determination Process

The following WSR Act Section 7 Determination process is adapted from a technical report by the Interagency Council (IWSRCC 2004). In conformance with the guidance contained in that report, the NPS will undertake the following steps as part of its Section 7 Determination process for non-emergency projects:

- Describe the purpose and need of the proposed project and its location, duration, magnitude, and relationship to past and future management activities.
- Analyze the potential impacts of the proposed project on the values for which the river was designated wild and scenic. This analysis will follow the guidelines provided by the *Wild and Scenic Rivers Act, Section 7 Technical Report* of the Interagency Council (2004), and other applicable guidance.
- Define the likely duration of the projected impacts.
- Use this analysis to make a WSR Act Section 7 Determination. This determination will document the effects of the proposed activity, including any direct and adverse effects on the values for which the river was designated as wild and scenic.
- Redesign and resubmit any water resources projects found to have a direct and adverse effect on the values of this designated river for a subsequent Section 7 Determination. In the event that a project cannot be redesigned to avoid direct and adverse effects on the values for which the river was designated, the NPS will either abandon the project or advise the Secretary of the Interior in writing and report to Congress in writing in accordance with WSR Act section 7(a).
- Follow WSR Act section 7 procedures to determine if projects above or below the designated river or on its tributary streams would invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the designated corridor.

Emergency projects, such as repairing a broken sewer line in or near the river, may temporarily proceed without a Section 7 Determination. However, a Section 7 Determination must be completed in a timely manner upon completion of the project. Emergency water resources projects that are later determined to have a direct and adverse effect on the river values shall be mitigated based on the findings of the Section 7 determination.

## Flowcharts to Illustrate WSR Act Section 7(a) Determination Process

The Interagency Council's *Wild and Scenic Rivers Act: Section 7 Technical Report* (IWSRCC 2004) suggests procedures to evaluate the effects of proposed water resources projects. The Interagency Council website<sup>6</sup> also includes examples of section 7 determinations for common types of water resources projects. The Interagency Council developed three flowcharts to guide managers in determining whether a proposal is subject to review under section 7(a) and, if so, which standard and evaluative procedure applies. These flowcharts, as illustrated in Figure 4-1, Figure 4-2 and Figure 4-3 also reference the appropriate detailed

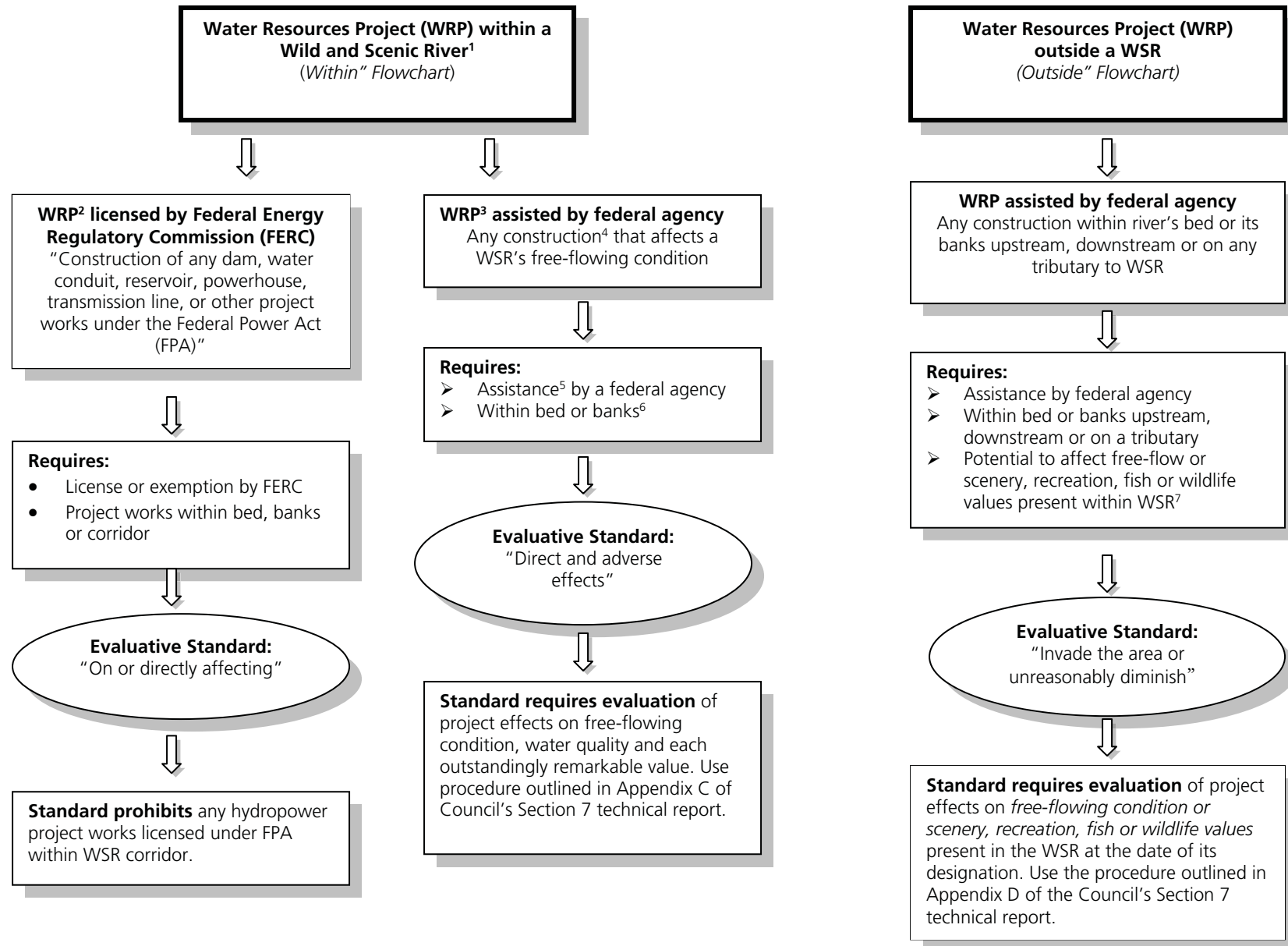
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<sup>6</sup> <http://www.rivers.gov/rivers/documents/section7/flowchart-introduction.pdf>

evaluative process in the Interagency Council’s Section 7 technical report. These flowcharts would be the basis of the section 7 determination process for the *Merced River Plan/DEIS*.

Using the flowcharts, managers would follow the track for proposed water resources projects located either *within* the Merced River corridor, or *outside* (upstream, downstream, or on a tributary to) the Merced River corridor (Figure 4-1). Figure 4-2 and Figure 4-3 provide a more detailed explanation of the process and may be used independent of Figure 4-1. Figure 4-2 would be used for water resources projects that would be located within a designated river corridor, and Figure 4-3 would be used for water resources projects that would be located outside a designated river corridor.

Figure 4-1: Wild and Scenic Rivers Act Section 7(a) Process Flowchart

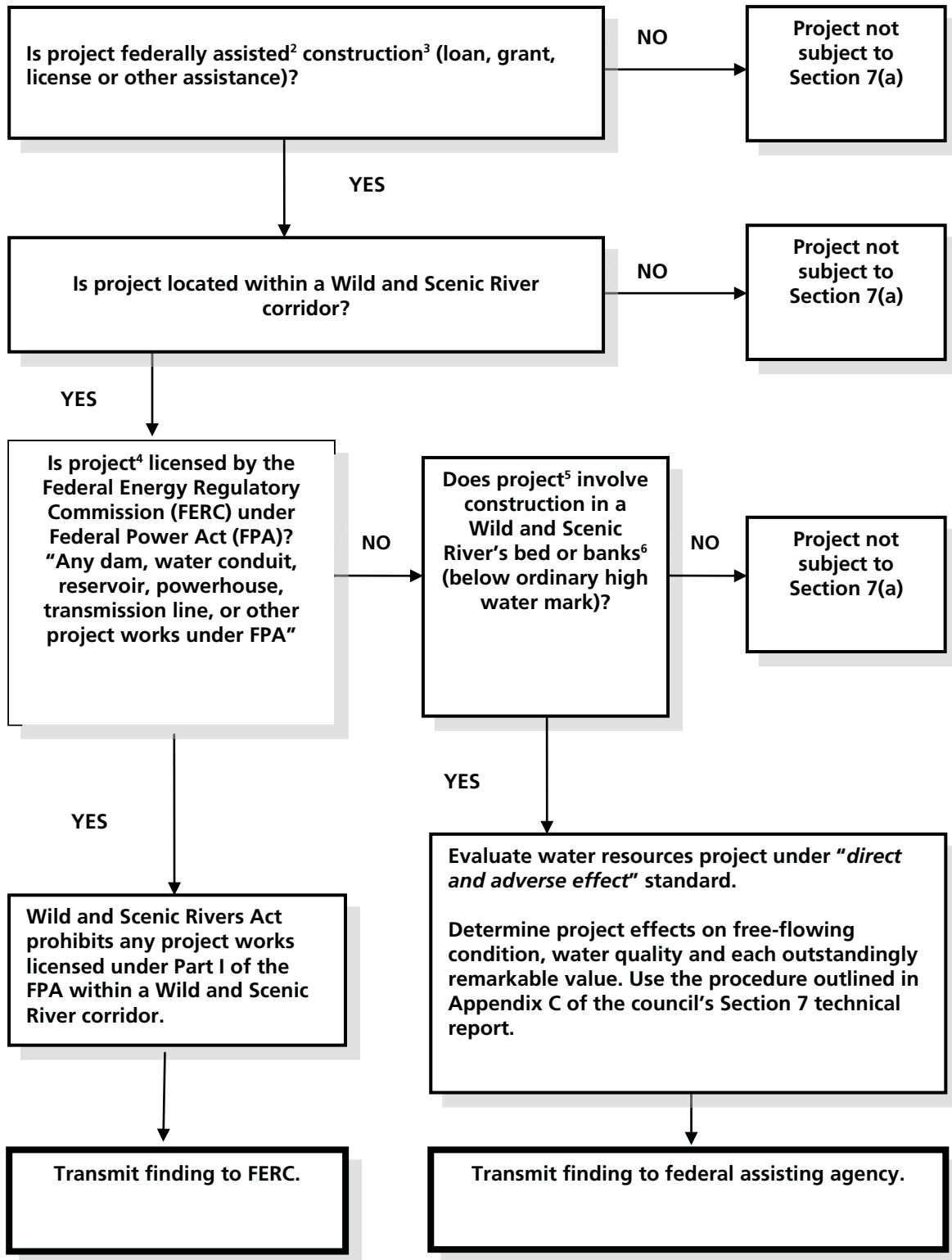


FLOWCHART FOOTNOTES

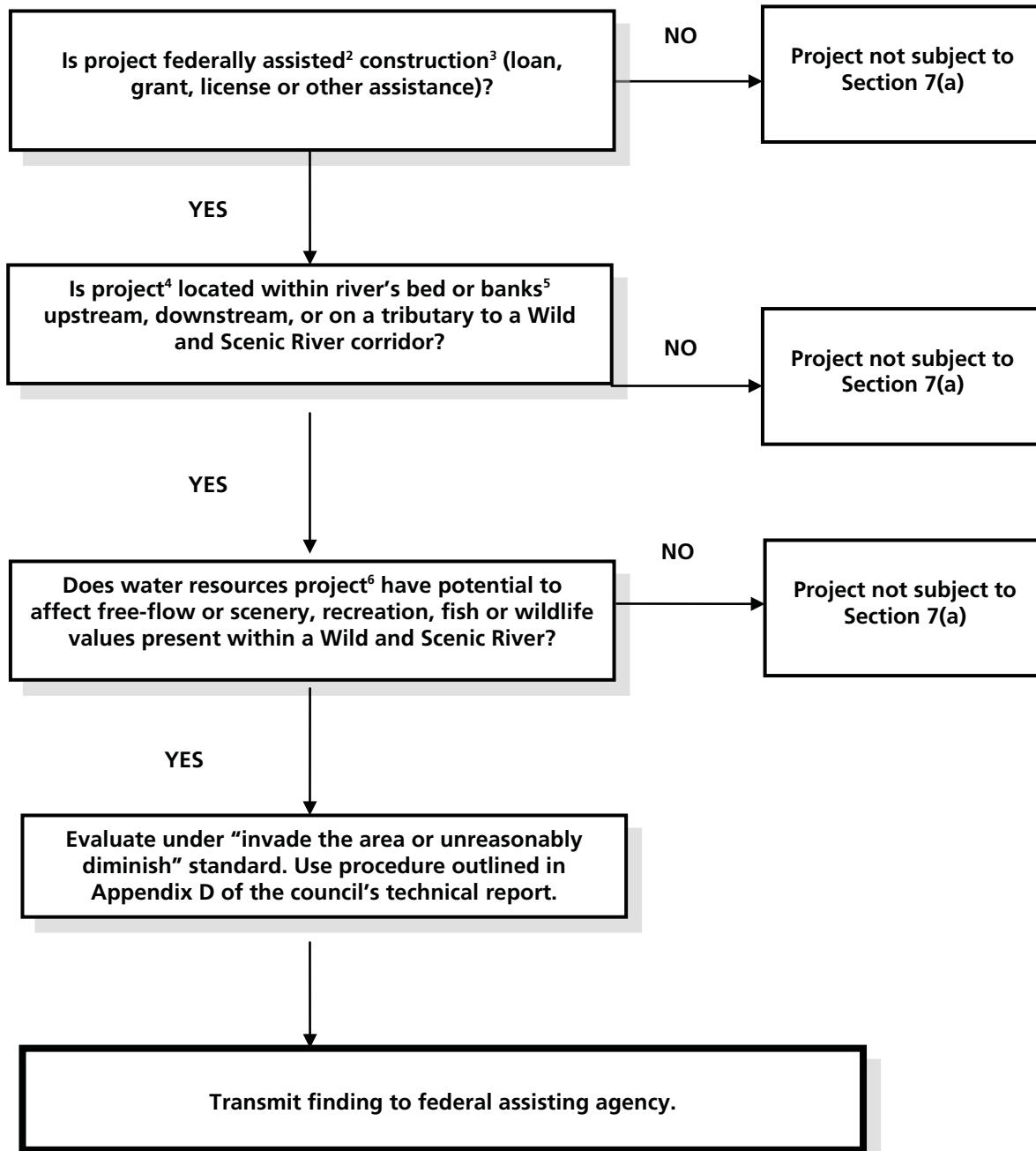
- <sup>1</sup> **A Wild and Scenic River** includes the river channel and adjacent areas within the Wild and Scenic River boundaries pursuant to Section 3(a) or 2(a) (ii) of WSRA.
- <sup>2</sup> **A water resources project** (i.e., a hydropower project licensed under the Federal Energy Regulatory Commission) refers to construction of any dam, water conduit, reservoir, powerhouse, transmission line, or other project work under the hydropower provisions (license and exemption) of the Federal Power Act (Part I), as amended (41 Stat. 1063; 16 USC 791a et seq.). Other facilities licensed by the Federal Energy Regulatory Commission under the Federal Power Act (e.g., interstate power transmission lines or natural gas pipelines) are not prohibited outright. They are subject to review under Section 7(a) only if they include construction as described in Footnote 6.
- <sup>3</sup> **A water resources project** is federally assisted construction that would affect a designated river's free-flowing characteristics, as defined in Section 16(b) of WSRA (see footnote 6). Examples of water resources projects include, but are not limited to: fisheries habitat and watershed restoration/enhancement projects; water diversion projects; transmission lines and pipelines; bridge and other roadway construction/reconstruction projects; dams; water conduits; bank stabilization projects; channelization projects; powerhouses; levee construction; reservoirs; recreation facilities such as boat ramps or fishing piers; or dredge and fill projects that require a federal permit, such as from the U.S. Army Corps of Engineers as required by Section 404 of the Clean Water Act (33 USC 1344).
- <sup>4</sup> **Construction** refers to any action carried out with federal assistance that would affect the free-flowing characteristics of a Wild and Scenic River.
- <sup>5</sup> **Assistance** refers to any loan, grant, license, or other assistance in the construction of any water resources project.
- <sup>6</sup> **'Bed or banks'** is an interpretation of Section 16(b) of WSRA, which defines free flowing, in part, as "existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway." Generally, the applicability of Section 7(a) is limited to the area within the ordinary high-water mark) of the river. The ordinary high-water mark is defined in 33 CFR Part 328.3(e) as "...that line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."
- <sup>7</sup> Requires a **nexus** between the proposed upstream, downstream, or tributary project and the Wild and Scenic River or such project is not a water resources project for purposes of a Section 7(a) determination. Projects that have the potential to affect the river's free flow or the scenery, recreation, fish, or wildlife values of a Wild and Scenic River are dams, upstream diversion structures and projects that can be seen from the Wild and Scenic River, as they have the potential to affect these characteristics and values in the designated river.



**Figure 4-2: Section 7(a) Flowchart for a Water Resources Project  
Within a Wild and Scenic River Corridor<sup>1</sup>**



**Figure 4-3: Section 7(a) Flowchart for a Water Resources Project Outside of a Wild and Scenic River Corridor**



## 5. RIVER VALUES AND THEIR MANAGEMENT

This chapter begins with a brief orientation to the river values identified for the Merced River, designated as a Wild and Scenic River in 1987, and the concepts of management standards, adverse effect, and degradation integral to protection. The bulk of the chapter discusses each river value in detail, including a summary of its current condition, associated management concerns and considerations, specific actions to protect and enhance the river value, and the monitoring program the National Park Service (NPS) will use to protect river values from adverse effect in the future. The monitoring program described in this chapter and the associated actions to protect river values are common to all alternatives. Further actions designed to enhance river values vary by alternative (see “Alternatives” Chapter 8).

### MANDATE TO PROTECT AND ENHANCE RIVER VALUES

The Merced River was added to the National Wild and Scenic Rivers System in acknowledgement of the river’s (1) free-flowing condition, (2) water quality, and (3) outstandingly remarkable values (ORVs). Collectively, these qualities are referred to as river values. Section 10(a) of the Wild and Scenic Rivers Act (WSRA) provides the following broad direction related to river management:

*Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its aesthetic, scenic, historic, archaeologic, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.*

Under the Merced River Plan, protection and enhancement of river values is accomplished by a series of initial actions to address immediate concerns and a commitment to a monitoring program to ensure that river values remain protected over time. In addition, all action alternatives in the plan include a number of site-specific actions directed toward the general improvement of conditions in the river corridor, thereby enhancing river values and fulfilling the goals of the WSRA.

### THE RIVER VALUES OF THE MERCED WILD AND SCENIC RIVER

This section describes the river values of the Merced Wild and Scenic River. There are 20 outstandingly remarkable values (ORVs) in addition to the river’s free-flowing condition and water quality, which the Wild and Scenic Rivers Act stipulates must be protected for all Wild and Scenic Rivers.

#### Free-Flowing Condition

A river must be in a free-flowing state to be eligible for inclusion in the National Wild and Scenic Rivers System. Once a river is designated, the managing agency is required to preserve it in its free-flowing condition for the benefit and enjoyment of present and future generations.

## Water Quality

Another goal of the WSRA is to protect the water quality of designated rivers. Water quality in the Merced River is exceptionally high, and far superior to federal and state standards.

## Outstandingly Remarkable Values (ORVs)

Section 1(b) of WSRA describes other values to be protected with wild and scenic river designation:

*“It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be preserved for the benefit and enjoyment of present and future generations”.*

The Interagency Wild and Scenic Rivers Coordinating Council (Interagency Council or IWSRCC) was formed in 1995 to assist those federal and state agencies charged with administering designated wild and scenic rivers.<sup>1</sup> The council’s mission is to make recommendations that will foster consistency in the interpretation and implementation of WSRA. The council has issued specific guidance and criteria for identifying ORVs (IWSRCC 1999):

- To be considered an ORV, a value must be river-related or river-dependent. To be considered river-related or river-dependent, a value must be located in the river or on its immediate shorelands (generally within 0.25 mile on either side of the river); contribute substantially to the functioning of the river ecosystem; and/ or owe its location or existence to the presence of the river.
- To be considered an ORV, a value must be rare, unique, or exemplary in a regional or national context. To be considered rare, unique, or exemplary, a value should be a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary.

The council described additional criteria for assessing each category of ORVs listed in the WSRA, noting that these criteria may be modified to make them more meaningful to a particular river. The council also notes that while no specific national evaluation guidelines have been developed for the “other similar values” mentioned in WSRA, agencies may assess additional river-related values, including but not limited to hydrology, paleontology, and botany resources, consistent with the guidance provided (IWSRCC 1999).

The NPS described and refined ORVs for the Merced River several times during the planning history for the river. As noted above, ORVs for the Merced were discussed in the river’s eligibility study (1986), the 1996 *Draft Yosemite Valley Housing Plan*, and previous river plans (2000 and 2005) that were ultimately invalidated by legal decisions. The major changes in the ORVs through time were:

- Air quality was listed as an ORV in the 1996 *Draft Yosemite Valley Housing Plan*. Air quality was not listed as an ORV in the 2000 *Merced River Plan/EIS* and subsequent plans because it was inconsistent with IWSRCC criteria, and because it is not river-related or river-dependent.
- “Scientific resources” were removed as an ORV because the topic was considered vague, and the topic was inherent in all ORVs.
- Two ORVs, geology and hydrology, were merged in 2010. In the view of subject-matter experts, these interdependent ORVs are difficult to address separately in the context of the *Merced River Plan/DEIS*.

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<sup>1</sup> See <http://rivers.gov/council.html>.

In 2010, the NPS conducted six workshops to consult with members of the public, academia, tribes, and other governmental agencies regarding ORVs for the *Merced River Plan/DEIS*. At the public workshops, the NPS described the ORVs to date and asked three questions:

1. Do you have any specific knowledge of locations with river-related or river-dependent features or resources not addressed by the NPS ORV report?
2. Do you have any knowledge or observations regarding the conditions of river features and values that should be addressed?
3. How should the NPS protect and enhance river resources and values?

The NPS also accepted written input on ORVs, and more than 30 people or organizations submitted letters. With input from other agencies, tribes, and members of the public, Yosemite park staff used the best available science and their professional judgment, to refine and finalize the list of river-related values for the *Merced River Plan/DEIS* (Table 5-1). The Sierra Nevada region was the primary region of comparison for determining rare, unique or exemplary status. More detail about each of the Merced River ORVs is provided in this chapter.

**TABLE 5-1: OUTSTANDINGLY REMARKABLE VALUES (ORVs) OF THE MERCED WILD AND SCENIC RIVER IN YOSEMITE**

<b>Outstandingly Remarkable Values of the Merced Wild and Scenic River in Yosemite</b>
<b>Biological ORVs</b>
<b><i>Segments 1 and 5 – Merced River Above Nevada Fall and South Fork Merced River Above Wawona</i></b>
1. The Merced River sustains numerous small meadows and riparian habitat with high biological integrity.
<b><i>Segment 2 – Yosemite Valley</i></b>
2. The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada.
<b><i>Segments 7 and 8 – Wawona and South Fork Merced River below Wawona</i></b>
3. Sierra sweet bay ( <i>Myrica hartwegii</i> ) is a rare plant found on river banks of the South Fork Merced River.
<b>Geologic/Hydrologic ORVs</b>
<b><i>Segment 1 – Merced River Above Nevada Fall</i></b>
4. The upper Merced River canyon is a textbook example of a glacially-carved canyon.
<b><i>Segment 2 – Yosemite Valley</i></b>
5. The “Giant Staircase,” which includes Vernal and Nevada falls, is one of the finest examples in the western United States of stair-step river morphology.
6. The Merced River from Happy Isles to the west end of Yosemite Valley provides an outstanding example of a rare, mid-elevation alluvial river.
<b><i>Segment 4 – El Portal</i></b>
7. The boulder bar in El Portal was created by changing river gradients, glacial history, and powerful floods. These elements have resulted in accumulation of extraordinarily large boulders, which are rare in such deposits.
<b>Cultural ORVs</b>
<b><i>Segment 2 – Yosemite Valley</i></b>
8. Yosemite Valley American Indian ethnographic resources include a linked landscape of specifically mapped traditional-use plant populations and as well as the ongoing traditional cultural practices that reflect the intricate continuing relationship between indigenous peoples of the Yosemite region and the Merced River in Yosemite Valley.
9. The Yosemite Valley Archeological District is an unusually rich and linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement.

**TABLE 5-1: OUTSTANDINGLY REMARKABLE VALUES (ORVs) OF THE MERCED WILD AND SCENIC RIVER IN YOSEMITE**

<b>Outstandingly Remarkable Values of the Merced Wild and Scenic River in Yosemite</b>
<b>Cultural ORVs (continued)</b>
<b><i>Segment 2 – Yosemite Valley (continued)</i></b>
10. The Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system.
<b><i>Segment 4 – El Portal</i></b>
11. The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region and archeological remains of the Johnny Wilson Ranch, a regionally rare historic-era American Indian Homestead.
<b><i>Segment 5 – South Fork Merced River Above Wawona</i></b>
12. This segment includes regionally rare archeological features representing indigenous settlement and use along the South Fork Merced River at archeological sites with rock ring features.
<b><i>Segments 5, 6, 7, and 8 – South Fork Merced River above Wawona, Wawona Impoundment, Wawona, South Fork Merced River below Wawona</i></b>
13. The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including unusually rich evidence of continuous far-reaching traffic and trade. In Segment 7, remains of the U.S. Army Cavalry Camp A. E. Wood document the unique Yosemite legacy of the African-American Buffalo Soldiers and the strategic placement of their camp near the Merced River.
14. The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity.
<b>Scenic ORVs</b>
<b><i>Segment 1 – Merced River Above Nevada Fall</i></b>
15. Visitors to this Wilderness segment experience exemplary views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks.
<b><i>Segment 2 – Yosemite Valley</i></b>
16. Visitors to Yosemite Valley experience views of some of the world’s most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls.
<b><i>Segment 3 – The Merced Gorge</i></b>
17. The Merced River drops 2,000 feet over 14 miles, a continuous cascade under exemplary Sierra granite outcrops and domes.
<b><i>Segments 5 and 8 – South Fork Merced River Above and Below Wawona</i></b>
18. The South Fork Merced River passes through a vast area of exemplary and wild scenic beauty.
<b>Recreational ORVs</b>
<b><i>Segment 1 – Merced River Above Nevada Fall</i></b>
19. Visitors to federally designated Wilderness in the corridor engage in a variety of river-related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the experience.
<b><i>Segment 2 – Yosemite Valley</i></b>
20. Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley’s extraordinary setting along the Merced River.

## PROTECTING AND ENHANCING RIVER VALUES

At the direction of the U.S. President in 1982, the Secretaries of the Interior and of Agriculture jointly promulgated regulations (hereafter referred to as the guidelines<sup>2</sup>) implementing WSRRA. The guidelines interpret the “protect and enhance” directive of WSRRA as a “nondegradation and enhancement mandate for all designated river areas, regardless of classification.” Under the guidelines, rivers must be “managed to protect and enhance the values for which the river was designated, while providing for public recreation and resources uses which do not adversely impact or degrade those values.” To do so, agencies are instructed to address the kinds and amounts of public use that the river area can sustain without adverse effect to river values. Guidance is also provided on the location of major public-use facilities with regard to the river corridor and agencies are instructed to ensure that any such development does not adversely impact river values.<sup>3</sup>

The U.S. Court of Appeals for the Ninth Circuit (the Ninth Circuit) has interpreted WSRRA and its implementing guidelines to mean that a comprehensive river management plan must contain provisions designed to prevent any adverse effects or degradation from occurring. Specific thresholds must be stated for mandatory management action that will occur ahead of any such impacts or degradation. In addition, a comprehensive river management must address “both past and ongoing degradation.”<sup>4</sup>

In its technical report on managing wild and scenic rivers, the Interagency Council recommends that managers should document and eliminate adverse effects on ORVs, free flow, and water quality, “including activities that were occurring on the date of designation.”<sup>5</sup> According to the council, any past degradation or adverse effects in existence as of the date of designation should be carefully assessed, and the managing agency should establish “a positive trajectory for any value that was in a degraded condition.”<sup>6</sup>

In order to assess the health of river values at the date of designation and to ensure that no further degradation or adverse effect occurs, the Interagency Council recommends “the river administering agency should document baseline resource conditions and monitor changes to these conditions.”<sup>7</sup> According to the council, this baseline:

*“...serves as the basis from which the degree/intensity of existing and future impacts can be measured. All future activities are to be measured from this baseline to ensure continued high quality conditions and to eliminate adverse impacts (protect) or improve conditions (enhance) within the river corridor. If a thorough resource assessment that includes a baseline description of the outstandingly remarkable values is not completed at the time of designation, this assessment should be included in the river management plan. The river management plan then establishes the baseline conditions at the time of designation—including a description of any degradation—and proposes management actions that will be taken to improve conditions until they meet the requirement to protect and enhance the river’s values.”*

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<sup>2</sup> National Wild and Scenic River System; Final Revised Guidelines for Eligibility, Classification and Management of River Areas, 47 FR 39454 (1982).

<sup>3</sup> Id. at 39458-9. In order to be located within the river area, major public use facilities such as visitor centers, administrative facilities, and developed campgrounds, must be (1) necessary for public use or resource protection; and (2) infeasible to move outside the river area; and (3) have no adverse effects on River Values.

<sup>4</sup> Friends of Yosemite v. Kempthorne, 520 F.3d 1024, 1035-36 (Ninth Circuit, 2008) [hereafter FYVIII].

<sup>5</sup> IWSRCC, “Wild and Scenic River Management Responsibilities,” page 26 (2002), available at <http://www.rivers.gov/publications/management.pdf>.

<sup>6</sup> IWSRCC, “A Compendium of Questions and Answers Relating to Wild & Scenic Rivers,” page 69 (2011), available at <http://rivers.gov/publications/q-a.pdf>.

<sup>7</sup> IWSRCC, “Wild and Scenic River Management Responsibilities,” page 22 (2002), available at <http://rivers.gov/publications/management.pdf>.

By assessing baseline conditions, past adverse effects or degradation can be identified and corrected.<sup>8</sup> In addition, any downward trends that could lead to adverse effects or degradation can be identified and addressed at an early stage. The river management plan then responds to the management situation described in the baseline condition report. The plan identifies management actions needed to correct situations where river values are threatened and proposes additional actions to enhance river values, where possible. In April 2011, the NPS produced a draft baseline conditions report of river values both at the time of the Merced River's 1987 designation and 2010. The July 2012 version of the *Merced Wild and Scenic River Values Baseline Conditions Report* incorporates the findings of scientific studies conducted specifically for the Merced River planning effort.

The WSRA program embodied in the river management plan includes the following steps, each of which is important in carrying out the act's mandate:

1. Identify and define river values
2. Define the terms "adverse effect," "degradation," "enhancement," "management standard," "management concern," and "management consideration" as they are used to describe the condition of river values
3. Assess the baseline condition of all river values, including both the current state and, to the extent possible, the condition at the time of designation (1987)
4. Select measurable indicators for each river value, and set metrics for the associated management standard and triggers for management concerns as well as thresholds for adverse effect and degradation
5. Assess each river value for the presence of adverse effects, degradation and/or management concerns, as defined in steps 2 and 4
6. Describe and commit to management actions needed to mitigate or eliminate adverse effects, degradation and management concerns
7. Implement a monitoring program for each indicator, with pre-determined conditions which will trigger specific management actions needed to ensure that river values remain protected and enhanced over time.

## KEY CONCEPTS FOR RIVER MANAGEMENT UNDER WSRA

The following sections provide definitions of "adverse effect" and "degradation" in the context of WSRA requirements, which are not to be confused with similar terminology used for the National Environmental Policy Act (NEPA) analysis included in "Volume II" of this EIS or the analysis completed in accordance with the National Historic Preservation Act (NHPA). For purposes of WSRA, an *adverse effect* to a river value is not synonymous with an *adverse effect* to an impact under NEPA or an *adverse effect* to a historical property under NHPA. In this chapter, adverse effects under WSRA pertain specifically to ORVs and are defined according to measurable thresholds determined at a segmentwide scale. Adverse effects documented in NEPA for this plan are resource-specific and may be observed at a smaller scale. Thus, the adverse effects reported in Volume II do not necessarily equate to adverse effects/effects under WSRA/NHPA.

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<sup>8</sup> According to the Interagency Council, adverse effects to river values "must be identified in development of the CRMP, with appropriate strategies detailed for their resolution." IWSRCC, "Wild and Scenic River Management Responsibilities," page 22 (2002), available at <http://rivers.gov/publications/management.pdf>.



Just as clarity is needed when defining the ORVs, it is necessary to define a number of terms in order to know how to translate the protection and enhancement mandate of WSR into management activities. Recent guidance by the Interagency Council (IWSRCC 2011) equates protection under WSR with the elimination of adverse effects. It is, therefore, important to define adverse effect in order to know what constitutes a “protected” state. The following sections define this term and others that are used in the management framework for protecting individual river values that has been developed for this plan and included in full detail later in the chapter.

## Adverse Effect (WSR)

*Adverse effect* is defined as a substantial reduction in the condition of a river value in relation to baseline conditions as a result of public use, development, and/or administrative use. An adverse effect is a segmentwide condition and requires immediate attention by the agency. It may be detected by periodic monitoring or by other means. When more than one indicator is monitored for any river value, an adverse effect associated with any one of the indicators constitutes an adverse effect on the value as a whole.

Under WSR, the NPS must protect the river area against those impacts that “substantially interfere” with river values.<sup>9</sup> Degradation is not explicitly defined by WSR or the Interagency Council guidelines. In cases of this nature, the Ninth Circuit has held that, absent further guidance, such terms should be given their ordinary meaning.<sup>10</sup> Therefore, the NPS has defined the term in accordance with its plain, ordinary meaning, and best professional judgment. The conclusion reached was that, for purposes of WSR, an adverse effect would be defined as a substantial reduction in the condition of a river value throughout a given river segment. Such an impact could be sudden and unforeseeable, or it could develop over a specified period of time, as reflected through the findings of periodic assessments.<sup>11</sup>

As discussed in this chapter, the specific conditions that constitute an adverse effect have been defined for each river value. These metrics were established using the best available scientific information, including research conducted specifically for this planning effort, and reasoned professional judgment.

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<sup>9</sup> *Hell’s Canyon Alliance v. U.S. Forest Service (USFS)*, 227 F.3d 1170, at 1177-78 (Ninth Circuit 2000). As one court has observed, the act requires managers to exercise discretion and judgment in order to strike a balance between use and preservation. *Sierra Club v. Babbitt*, 69 F. Supp. 2d 1202, 1254 (E.D. Cal. 1999). (“If anything, the WSR seems deliberately ambiguous as to how an agency is supposed to balance the recognized tension between use and preservation.”)

<sup>10</sup> *Friends of Yosemite Valley v. Norton*, 348 F.3d 789, 796 (Ninth Circuit 2003) (citing *Hell’s Canyon Alliance v. USFS*, 227 F.3d 1170, at 1177 (Ninth Circuit 2000)). “Degradation” is not a term from the act, but from the Secretaries’ Guidelines for River Areas. The Supreme Court has recently reaffirmed that where an agency’s regulations construing a statute are ambiguous, the agency’s own interpretation of those terms are entitled to substantial weight. *Chase Bank USA, N.A. v. McCoy*, 131 S. Ct. 871, 880 (2011). In this case NPS has determined that the ordinary meaning of the term “degradation” is the most reasoned reading of the text of the guidelines because it will enable the agency to use the best available science to establish clear and specific thresholds for degradation of each outstandingly remarkable value (ORV), as well as a monitoring program that triggers action intended to prevent degradation prior to its incidence. See FYVIII, 348 F.3d at 1034.

<sup>11</sup> The requirement that in order to be an adverse effect, a decline must be substantial and sustained over time is intended to exclude limited, transitory, or natural fluctuations in condition from the definition. Many river values may experience temporary downward trends that are not indicative of any threat to the segment-wide condition of the river value as a whole. For example, an animal may drown while crossing the Merced River, thereby temporarily increasing nearby coliform bacteria counts. In another example, some downward trends may be the result of natural variations in function over time. Drought years, for example, may negatively influence the diversity and productivity of grasses in Yosemite Valley Meadows for several years in a row. For these reasons, the trends leading to adverse effects must be reflective of something more than inconsequential changes or short-term fluctuations. More rarely, sudden unforeseeable impacts may occur that require immediate action to mitigate. For example, a chemical or fuel spill that meadow would create such an adverse effect.

## Degradation

**Degradation** is defined as the state in which a river value has been fundamentally altered by public use or development to the point that its value is lost for at least a decade. Degradation is a long-term condition that is segmentwide. A river value has been degraded when recovery would only be possible through a sustained change in park management and a significant investment of financial and natural capital. Degradation may be detected by the baseline condition assessment, by periodic monitoring, or by other means.

The Ninth Circuit has held under WSRA that a comprehensive management plan must “trigger management action before degradation occurs.”<sup>12</sup> Like adverse effect, degradation is not defined in either the act or the guidelines. This plan therefore relies on the common, ordinary meaning of the term. Merriam Webster’s *Collegiate Dictionary, Tenth Edition*, defines degradation as a “decline to a low, destitute, or demoralized state,” while degrade is defined as “to lower or impair in respect to some physical property” or “to lower in grade, rank, or status.” Similarly, Webster’s *Third New International Dictionary Unabridged* uses both of the above definitions of degrade as well as “to lower from a superior to an inferior level.” Thus, the common, ordinary meaning of degradation is consistent with that given above: a substantial reduction in the condition of a river value to a clearly defined, low state of functioning.

As presented in this chapter, each river value has a specific set of conditions that equate to degradation. The NPS relied on the best available science and reasoned professional judgment in determining conditions.

## Enhancement

**Enhancement** is defined as actions taken to improve the condition of a river value. This definition is based upon guidance provided by the Interagency Council: “Enhance rivers by seeking opportunities to improve conditions.”<sup>13</sup> Such actions would improve the conditions of a river value to the point where the river value’s condition meets or exceeds the management standard (defined below).

## Management Standard

**A management standard** is defined as the desired condition of a river value. Under this plan, all river values will be protected and enhanced in accordance with WSRA and the Secretaries’ Guidelines for River Areas. The management standard is the desired condition of a river value attainable under current trends and influences beyond NPS control. As discussed in more detail below, most river values are currently in a condition that is better than the management standard and within desired conditions. Enhancement actions included in the plan will serve to increase this margin of quality.

## Management Concern

The goal of this river plan is to maintain all river values in a condition that meets or exceeds the associated management standard. However, in a dynamic natural setting, fluctuations in resource conditions can be expected to occur over time. The key to successful management then is to provide a series of checkpoints in the monitoring framework that will be used to trigger actions to arrest downward trends before conditions

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<sup>12</sup> FYVIII, 520 F.3d 1024, 1034-35 (Ninth Circuit 2008).

<sup>13</sup> IWSRCC, “Wild and Scenic River Management Responsibilities,” page 26 (2002), available at <http://rivers.gov/publications/management.pdf>.

drop below the management standard. Therefore, for each river value, a series of “trigger points” have been established at incremental levels above the management standard. When monitoring indicates that the condition of the river value has dropped below a trigger point, the situation is described as a **management concern**. Management concerns are to be immediately addressed and corrective measures have been pre-identified and included in the management framework described for each river value later in this chapter.

Management concerns are segmentwide conditions (such as informal trails fragmenting a meadow complex that dominates a river segment) but are correctable and do not bring the river value condition to the level of adverse effect or degradation. Another form of management concern is a downward trend in river condition that is occurring so slowly that the river condition has not yet been adversely affected but would if given adequate time and continued decline. In either case, the NPS will take the actions identified for each river value when a trigger point is reached. A river value that has documented management concerns is still considered to be protected but requires management action to remain so.

## Management Consideration

*Management considerations* are localized areas of impact to components of a river value where management actions can be taken that will improve (enhance) conditions in the river corridor. Management considerations were developed from information in the *Merced Wild and Scenic River Values Draft Baseline Conditions Report*, the 2011 ORV workshops, public comment, and park staff input. Management considerations also include programs or specific actions to protect and enhance the long-term condition of river values, such water quality monitoring. Because of limited extent, management considerations can be corrected with relatively simple actions that help to ensure the associated river value remains at or above the management standard.

## Baseline Conditions Assessment

To assess the health of river values and ensure that no degradation or adverse effect occurs, the Interagency Council recommends that managing agencies “document baseline resource conditions and monitor changes to these conditions.”<sup>14</sup> According to the council, the baseline resource condition:

*“... serves as the basis from which the degree/intensity of existing and future impacts can be measured. All future activities are to be measured from this baseline to ensure continued high quality conditions and to eliminate adverse effects (protect) or improve conditions (enhance) within the river corridor. If a thorough resource assessment that includes a baseline description of the ORVs is not completed at the time of designation, this assessment should be included in the river management plan [for the Merced River Plan/DEIS, that assessment is summarized in this chapter, and provided in its entirety in an attached DVD]. The river management plan then establishes the baseline conditions at the time of designation—including a description of any degradation—and proposes management actions that will be taken to improve conditions until they meet the requirement to protect and enhance the river’s values ...”*<sup>15</sup>

<sup>14</sup> Interagency Wild and Scenic Rivers Coordinating Council, “Wild and Scenic River Management Responsibilities,” page 22 (2002), available at: <http://rivers.gov/publications/management.pdf>.

<sup>15</sup> Interagency Wild and Scenic Rivers Coordinating Council, “A Compendium of Questions & Answers Relating to Wild & Scenic Rivers,” page 70 (2011), available at [www.rivers.gov/publications/q-a.pdf](http://www.rivers.gov/publications/q-a.pdf).

By assessing baseline conditions, managing agencies can identify and correct past degradation.<sup>16</sup> Downward trends that could lead to adverse effects and degradation can be identified and addressed at an early stage. In April 2011, the NPS produced a draft baseline conditions report of river values both at the time of the Merced River's 1987 designation and in 2010. The *Merced Wild and Scenic River Values Baseline Conditions Report* continued to be revised to reflect newly completed scientific studies that informed river values. An updated July 2012 baseline conditions report is available at [http://www.nps.gov/yose/parkmgmt/mrp\\_documents.htm](http://www.nps.gov/yose/parkmgmt/mrp_documents.htm).

## Monitoring Program

The monitoring program in the *Merced River Plan/DEIS* fulfills the Secretarial Guidelines to ensure “studies will be made during preparation of the management plan and periodically thereafter to determine the quantity and mixture of recreation and other public use which can be permitted without adverse effect on the resource values.” This plan defines a set of measureable indicators to monitor the condition of each river value through time as described in this chapter. Yosemite National Park staff selected indicators for their ability to provide insight into the integrity of the river value and provide early warnings of change. Park staff also required indicators to support objective and easily obtained data collection that is repeatable across time and across observers. The monitoring program for an individual river value may be refined, if necessary, through time as more information becomes available.

## HISTORICAL RESOURCE CONDITIONS ASSOCIATED WITH DEVELOPMENT

This section provides an overview of development patterns over time in Yosemite Valley, the extent of development that has occurred in the past, and how this development has been managed over the decades. The *Draft Baseline Conditions Report* (available online) provides more detailed information on changes in resource condition over time, and “Proposed Ecological Restoration Actions within the Merced River Wild and Scenic River Corridor” (Appendix E) provides a more detailed explanation on actions of this plan to improve conditions of the Biological ORVs.

## Overview of Historic Development Patterns

Since the Yosemite Grant was established in 1864, Yosemite Valley has been the focus of constant, ongoing human attention and manipulation. The Valley's development footprint has constantly changed over time, growing, shrinking, and changing pursuant to the human needs and perceptions of the given era. Along with the development footprint, human activities have influenced the natural vegetation and condition of the Merced River over time. These changes have been the subject of numerous inquiries over time, including several books (Runte 1990, Demars 1991, Sanborn 1981, Carr 1998) and, more recently, a National Register nomination (NPS 2006) for the Yosemite Valley Historic District. The nomination, which succinctly describes the long evolution of Yosemite Valley development, indicates several changes in park philosophy since 1864:

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<sup>16</sup> According to the Council, adverse effects to River Values “must be identified in development of the comprehensive management plan, with appropriate strategies detailed for their resolution.” Interagency Wild and Scenic Rivers Coordinating Council, “Wild and Scenic River Management Responsibilities,” page 22 (2002), available at <http://rivers.gov/publications/management.pdf>.

*“The Yosemite Valley landscape is the result of a long and complex history of interactions between natural systems and human influences. For thousands of years, American Indians managed the landscape through burning and other practices. In the 1860s, Euro-Americans took over management of the valley floor landscape for the purpose of preserving it as a public park. This has resulted in a 150-year history of agricultural use, clearing, burning, and facility development. Yosemite Valley today is the landscape record of one of the most ambitious and historically significant experiments in the preservation of natural scenery ever attempted.”*

Unlike much of the rest of Yosemite and most backcountry areas in the country’s other large national parks, Yosemite Valley is a landscape as much influenced by people as it is by nature.

Historic manipulations of the Yosemite Valley landscape began almost immediately after Euro-American discovery. The first permanent hotel in Yosemite Valley was built in 1856. Called the Lower Hotel, it was the first of a string (Lower Hotel, Upper Hotel, Leidig Hotel) that were in place by 1869 (Greene 1987). Clusters of buildings also proliferated at the foot of the present Four Mile Trail (the “Lower Village”), and south of the river to opposite Yosemite Falls (Yosemite Village, now referred to as Old Yosemite Village). The first road reached the valley in 1874, with a carriage road circumnavigating the valley floor completed in 1882. During this era (1851-1889), homesteaders built farm buildings, corrals, fences, bridges, a ferry crossing, gardens, orchards, irrigation ditches, fenced grazing areas, sawmills, and plantings of hay and grain. Visitors also camped anywhere they desired throughout the valley in this era.

This summary of human structures only begins to provide one with an idea of the full extent of human activity and changes occurring in the valley at this time. Widespread human *activity* was also occurring that manipulated the landscape in both obvious and subtle ways. Additional vignettes taken from the Yosemite Valley Cultural Landscape Report (1994) demonstrate Yosemite Valley was no different from the rest of California, experiencing rapid and irreversible change at this time:

- *“The land between Hutchings’ House (Sentinel Hotel) and the Merced River was a small lawn with scattered shade trees, hitching posts and rails. Across the river, meadowland was used to grow hay” (1868).*
- *“By 1870, Lamon’s gardens and orchards were producing strawberries, raspberries, blackberries, apples, pears, peaches, nectarines, plums, and almonds. In additions, 20 acres of El Capitan Meadow were plowed in an unsuccessful attempt to grow hay.”*
- *“In 1879, the portion of land between the later Sentinel Hotel and the Merced was in use as a barnyard.”*
- *“To alleviate the problem of the winding Merced River’s tendency to change its banks and threaten crops and buildings, and to drain some of the valley’s swampy meadows for development, Galen Clark used dynamite to blast away much of the moraine at the foot of the El Capitan. With the natural dam removed, the water table dropped at least five feet” (Milestone 1978 and 1990).*
- *“After the moraine was blasted, the marshy Leidig Meadow became fit for cultivation. The meadow was sown with timothy for hay until 1888.”*
- *“In 1881, fine forage grasses had been thinned out of the meadows by constant travel and grazing animals. Coarser, more robust grasses replaced them.”*
- *“In 1884, to stop the Merced’s erosion activities, a trench lined with willow trees planted at an angle of forty degrees was dug along the river’s banks and filled with rocks.”*
- *“One hundred and fifty acres of the Stoneman Meadow were cleared and plowed for hay in 1887.”*
- *“J.M. Hutchings established an elm-lined boardwalk between his hotel (the Upper Hotel or Sentinel Hotel) and his home at the foot of Yosemite Falls around 1866.”*

Rapid development in Yosemite Valley inspired John Muir to fight for national park designation, which occurred in 1890. While 1,400 square miles surrounding Yosemite Valley were designated as national park, the original Yosemite Grant lands (the Valley and Mariposa Grove) were not. Nonetheless, the change in land designation surrounding the valley inspired the first understanding that rampant development and manipulation of the valley itself should be limited, for the State of California Commissioners overseeing it wrote: “The policy of this Commission is to preserve the floor of the valley as nearly as possible in its natural state; to avoid the grouping of buildings so as to form a village . . . to restore as rapidly as consistent with well ascertained principles of forestry, the park-like condition of the valley” (State of California 1890). Implementing policy over the course of the next decade, the commissioners specified no more than 200 acres on the valley floor would be under cultivation at one time. The commissioners also began the first attempts to improve resource conditions in the Valley:

*“The policy of the commissioners of 1890 was to restore the vegetation of the valley to its 1851 appearance by clearing underbrush, reducing human intrusions to a minimum, and encouraging the growth of flowering plants. They responded to criticism of their management by arguing that the shifting banks of the Merced were responsible for much of the destruction of timber and meadowland in the valley.”*

While these ideas were notable in their novelty, actual reduction in impacts did not occur throughout Yosemite Valley. Indeed, 1890 was perhaps the beginning of over a century of debate about what the proper level of development and recreation in the valley should be, and about the tension between articulated policies and their implementation on the ground in Yosemite Valley. While the commissioners oversaw the demolition of numerous structures and the continued clearing of trees and brush from meadows, the park’s concessioner was expanding facilities to accommodate growing tourist numbers during that same time period with Camp Curry opening in 1899. In another example of actions taken to both protect park resources while accommodating visitors, riprap to protect a sugar pine at the bridge of the same name was installed in 1899, while almost all of Lower Village was removed (with only three buildings remaining there by 1901) (NPS 1994).

The paired efforts to protect resources and accommodate visitation continued during the U.S. Army’s oversight of Yosemite (1906 to 1916), as well as the beginning years of the NPS (that took over Yosemite’s administration in 1916). The army oversaw the construction of roads for automobile use. Tourist establishments complemented the roads. By 1913, the Old Village contained a general store, studio, dance and lecture pavilion, offices, the Cosmopolitan Bathhouse, several cottages, the Yosemite Chapel, a butcher shop, bakery, Wells Fargo office, cottages, a Masonic Lodge, and miscellaneous residences and out buildings. Nearby, a paddock for Tule elk appeared, as did an ice rink, ski jump, and toboggan run. Entertaining events complemented the structures, with bear-feeding shows and the fire fall starting during this era; riprapping continued as well.

Conversely, between 1916 and 1931, the NPS replaced this same village with its contemporary Yosemite Village. Designed and planned to be more harmonious with the surroundings, the new village was farther away from the Merced River (NPS 1994). The NPS phased out grazing in valley meadows, created designated picnic areas, and experimented with burning in Ahwahnee, Cook’s and Bridalveil meadows.

The pattern of development and protection continued into the modern era. Mission 66, a decade-long program to upgrade park facilities nationwide, resulted in more structures in Yosemite Valley, as well as the removal of development from valley meadows, and an increase in associated meadow restoration programs.

Today, this combination of protecting and restoring resources while managing for development away from the river continues. The comparison of past development to current development shows the struggle between accommodating visitors and the services they require while protecting the natural scenery that drew tourists to Yosemite Valley in the first place. Never an easy balance to strike, this cursory review indicates that, while the development footprint has not decreased substantially, it has shifted away from the Merced River corridor and its Biological ORVs. Additionally, while some perceived incongruent activities may still occur in the valley, many more have joined the history books as public thinking about natural resource management and national park service policy has evolved. Overall, the NPS has done much to protect and enhance the Merced River and its resources before ORVs were ever defined.

Further detail on the impacts from development and public use can be found under the Historic Resource Conditions section under each individual ORV explanation.

## **Historical Resource Conditions by ORV**

The following sections examine the impacts to ORVs from this history of development and public use.

### ***Biological and Geological/Hydrological ORVs***

**Yosemite Valley Meadows and Riparian Vegetation:** It is widely acknowledged that there have been significant changes in the vegetation composition of Yosemite Valley since 1851, particularly with regard to increase in extent/density of conifers and reduction of meadow extent. It is also widely acknowledged that American Indians strongly influenced the vegetation of Yosemite Valley (Gibbens and Heady 1964, Heady and Zinke 1978, Anderson 2005). While some scientific studies have shown natural factors contributing to these changes, it is most likely a combination of human induced and natural changes, such as cessation of American Indian burning, altered hydrology, domestic livestock grazing, public use of the meadows, wildlife herbivory, natural succession, and climate change.

Gibbens and Heady (1964) found that Yosemite Valley was forested prior to the arrival of American Indians, noting that American Indians controlled brush and tree growth in the Valley, keeping vegetation at the stage best suited to their needs. Indians largely accomplished this goal through the use of fire (Ernst 1943; Reynolds 1959, Anderson and Carpenter 1991, Taylor 2006). The Euro-American arrivals essentially eliminated anthropogenic fire from the Valley in the 1850s—perhaps the first ecological change bearing upon a Merced River ORV. Elimination had immediate effects, with a widespread establishment of trees in and around the meadows taking place after 1860 (Gibbons and Heady 1964). Plowing, mowing, burning, and probably in some cases severe overgrazing, complicated the increase in tree cover to varying degrees, as did the clearing activities of the 1890s, 1930s and 1940s. Nonetheless, a substantial reduction in the size of the meadows was becoming evident by the time Gibbens and Heady did their work.

Several authors (Heady and Zinke 1978, Anderson and Carpenter 1991, Taylor 2006) since have refined these conclusions, but the fundamental conclusion—that Yosemite Valley meadows have shrunk in size in the historic era—remains. Alterations in meadow hydrology, almost always making meadows drier, have had an equally altering effect. The blasting of the recessional moraine, for example, likely dropped the water table in El Capitan Meadow by approximately 5 feet, making it more conducive for tree establishment. Ditching done to drain the meadows had that effect, with roads built across meadows exacerbating the hydrological alterations (Madej et al. 1994, Milestone 1978, Cooper et al. 2008).

Madej conducted the primary investigation into the historic manipulation of the Merced River itself (Madej et al., 1991, Madej et al. 1994). She and her co-authors summarize the impacts to the Merced River in East Yosemite Valley in four general categories (Madej et al., 1991), all of which alter river dynamics significantly:

1. Vegetation loss caused by visitor use and subsequent bank erosion
2. Systematic removal of large wood from the channel up until the 1980s
3. Gravel mining for park road construction
4. Several bridges with openings too small to accommodate even minor flood flows

These changes have been significant, and likely irreversible. In fact, two of the scientists to examine Yosemite Valley meadows concluded—“So much alteration of the meadows has occurred that they can no longer be restored to their primitive state” (Heady and Zinke 1978:20). The extent to which this change should be considered adverse is unclear: Both Gibbens and Heady (1964) and Heady and Zinke (1978) argue that meadows largely exist and persist because of human intervention. To perpetuate meadows, perpetual management intervention will be required.

**High Elevation Meadows:** The meadows in the Merced Lake vicinity (Merced Lake-Shore, Merced Lake-West and Merced Lake-East, for example) were grazed by NPS and concessioner stock in 1987 and showed typical grazing-related impacts such as trampling, erosion, and a decline in herbaceous production (Sharsmith 1961).

### ***Cultural ORVs***

**Yosemite Valley, Wawona, and El Portal Archeological Districts:** Many of the most-researched archeological sites have been impacted by park-related development, often by construction of facilities that are now important historic resources themselves. For example, one multi-component archeological site located immediately adjacent to the LeConte Memorial Lodge experienced impacts from construction of the lodge and an associated road in 1915. At other archeological sites, pre-contact American Indian villages and middens have been damaged. The impacts have been largely due to construction of administrative and visitor facilities, including buildings, roads, utilities, trails, etc. In some El Portal locations, impacts to archeological sites are from mining and logging during the early 1900s. Though these sites may have been damaged, they are nonetheless listed as contributing elements of their respective archeological districts. The majority of the impacts to these sites occurred well before their National Register listings, and the impacts were not significant enough to preclude listing. Despite the impacts, these sites have been documented to contain intact cultural deposits with information important to understanding regional pre-contact and historic-era American Indian lifeways.

**Yosemite Valley Black Oaks:** Similar to meadows in Yosemite Valley, American Indians actively managed black oak stands in Yosemite Valley. This management likely included burning or hand pulling to discourage conifer encroachment and undergrowth, deer control, and planting. The purpose of this active management was to ensure a good harvest of acorns, which was an important part of their diet, and the reason for the Ethnographic ORV. Since the active management of black oak stands by American Indians ceased in the mid-1800s, mature individuals are being encroached upon by conifers, and recruitment (number of saplings) is low.



## **Scenic ORVs**

**Visible Historic Developments:** Historic developments may be visible from the river in segments 1, 2, 3, 6, and 7. These include the Merced Lake High Sierra Camp, roads and other transportation infrastructure, lodging such as Housekeeping Camp and Yosemite Lodge, and campgrounds in Yosemite Valley, for example. These historic-era developments may affect the scenic ORV.

## **Recreational ORVs**

Parkwide annual visitation was first recorded in 1906, marked at 5,414 annual visitors. A decade later, annual visitation increased six-fold to 33,390. At that time, the U.S. Army established checkpoints in Yosemite Valley (by 1913) to regulate traffic and respond to accidents (NPS 1994). Another 10 years later in 1926, annual visitation jumped to 274,209. It almost doubled again in 1936 to 431,192. While visitation was drastically reduced with the advent of World War II, the end of the war led to visitation skyrocketing. Visitation grew from 116,682 in 1943 to 640,483 in 1946. It was at this point in time when managers first acknowledged that existing visitor facilities and circulation routes were inadequate to handle the dramatic influx (NPS 1994). By the Mission 66 era, when visitation exceeded 1,000,000 (first in 1954), the NPS decided:

*“the limited area of the Valley, in relation to the physical facilities essential to operate the park and to serve the tremendous number of park visitors attracted to it, is the heart of the problem. We can no longer continue to build, construct and develop operating facilities on the Valley floor without seriously impairing and ultimately destroying those qualities and values which the National Park Service was created to preserve and protect for future generations”.*

Since then, visitation has continued to grow, regularly exceeding 2 million by 1967, 3 million by 1994, and 4 million today. Crowding and traffic congestion has become increasingly common.

## **River Values Not Impacted By Development**

Some ORVs have not been affected by past development: the boulder bar in El Portal, the Giant Staircase, the glacially carved canyon, scenery in the South Fork area, recreation above Nevada Fall, high elevation archeological sites and rare features along the South Fork of the Merced River, Sierra sweet bay, and water quality.

## **Conclusion for Historical Resource Conditions by ORV**

The above descriptions are just a very brief window into the multitude of changes that have taken place in Yosemite Valley since the first Euro-Americans arrived. The examples given illustrate the extent of past development in Yosemite Valley prior to the Merced Wild and Scenic designation. They are not meant to justify the current level of development in the Valley, but to remind us of how far the NPS has come in improving resource conditions within the Merced River corridor. Yosemite Valley has gone from an area where construction was haphazardly and hastily placed to capitalize on the best scenic views and where visitor use extended across most available space, to a more thoughtfully planned spatial organization that has attempted to move increasing use to areas of less sensitivity. The planned actions proposed in this Merced River Plan (see this chapter’s discussions of each ORV and in Chapter 8) are intended to ensure that ORVs are protected and to implement actions to enhance the river values.

## RIVER VALUE CONDITION, PROTECTION, AND ENHANCEMENT

This section describes the program to protect and enhance each ORV as proposed in the *Merced River Plan/DEIS*. For each ORV, the following will be discussed:

- The current condition of each ORV and condition at the time of the river's 1987 designation
- A description of the management program and actions to ensure each ORV is protected before adverse effects or degradation could take place. The management program includes:
  - A description of the indicator(s) used to monitor the condition of each ORV
  - Definitions of the management standard, adverse effect, and degradation
  - A description of the set of measures that would trigger increasingly aggressive management actions to protect each ORV
- Management concerns and associated protective actions proposed in Alternatives 2-6
- Management considerations and actions to enhance river values proposed in Alternatives 2-6

### River Value: Free-flowing Condition

River Value: Free-flowing Condition
<b>Location:</b> All Segments of the Merced River
<b>Description:</b> A free-flowing river, or section of a river, moves in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway (WSRA 1968, Section 16). Management considerations concerning free-flowing conditions focus on human-constructed modifications within the bed and banks of the Merced River, such as riprap, bridges, and infrastructure.
<b>Management Objective:</b> Reduce the overall amount of human-constructed modifications within the bed and banks of the Merced River through restoration, redesign, and other appropriate methods.

### *Condition at Time of Designation (1987)*

As the Merced River flows from its headwaters in the High Sierra at 13,000 feet through its descent to El Portal at 2,000 feet, various elements impeded its movement at the time of designation in 1987.

- In the highest reaches of the Merced River, a few small structures and scattered sections of riprap impeded river flows in Segments 1 and 5. A small diversion dam above Nevada Fall diverted some flows during spring high water. Four small, wooden footbridges crossed the river upstream of the Nevada Fall Bridge and created minor constrictions.
- Between Nevada Fall and the Happy Isles Bridge, bedrock and massive talus boulders line the river channel, making it more resistant to human impacts. The free-flowing condition of the river was largely intact in this section, with only minor constrictions at the Vernal Fall Bridge, the Happy Isles Bridge, the Happy Isles Gauging Station Footbridge, three footbridges near the Happy Isles Nature Center, and footings associated with the Happy Isles Diversion Dam (which were removed in 2004-2005). From Happy Isles Bridge to Clark's Bridge, the channel was confined on the right bank by moraines for much of its length. This reach was generally stable at the time of designation (Madej et al. 1991).
- Below Clark's Bridge, the river becomes a meandering alluvial system. Although the alluvial reach of the Merced River in Yosemite Valley has been relatively free-flowing compared with most rivers in California, this segment was the most impacted reach of the river within the park, especially in east Yosemite Valley floor between Clark's Bridge and Sentinel Bridge.

In 1879, large boulders were blasted to deepen and widen the river gap through the El Capitan moraine, which lowered the base level of the Merced River by four to five feet (Milestone 1978). As a result, the extent and frequency of flooding in the upstream meadows were reduced within approximately three to four miles of the moraine (approximately up to Superintendent's Bridge) leading to drier conditions and loss of wetlands.

Since the 1870s, large wood, such as downed trees and logjams, was removed from the river to reduce flood risk near bridges and to facilitate road construction and river recreation. Large organic matter contributes to channel *roughness*, which slows down flows and dissipates energy of the water. The practice has encouraged faster, more erosive flows and promoted vertical channel erosion, referred to as downcutting, rather than point bar creation, lateral migration, and avulsion. The removal of large wood also contributed to channel simplification, creating a more homogeneous river. An inventory of large wood was done around the time of the river's 1987 designation (Madej et al. 1994). This study found 12 pieces of wood per kilometer in the upper study reach (between Clark's Bridge and Sentinel Bridge) and 29 pieces per kilometer in the lower reach (comprising 1.6 miles upstream of El Capitan Bridge). Cardno ENTRIX repeated this survey in 2010 and found the level of wood loading in 1994 was 7%-17% of the levels found in natural systems within the Douglas-fir/ponderosa pine forest of the eastern Cascades (Fox and Bolton 2007).

Evidence, such as historical maps and floodplain topography, suggests the Merced River has always had a high rate of lateral erosion, which may have increased in response to human activities, such as trampling along the banks. Between 1879 and the early 1970s, the NPS performed extensive bank stabilization to prevent channel migration near campsites and infrastructure. Riprap—used successfully as a management tool to prevent channel erosion—inhibits the free-flowing condition of the river by preventing natural stream processes, such as lateral migration and point bar formation (Florshiem et al. 2008; Schmetterling et al. 2001). By 1987, 25% of the river's banks had undergone bank revetment, primarily lined with riprap, between Clark's Bridge and Sentinel Bridge (the area with the greatest infrastructure and human presence). In the less-visited West Valley downstream of Swinging Bridge, riprap lines only 2% of the channel.

Between 1919 and 1986, visitor trampling along the banks between Clark's Bridge and Sentinel Bridge damaged riparian vegetation to the point that the river channel widened by an average of 27% and by more than 100% in some locations. In 1987 at the time of designation, 39% of the Yosemite Valley segment was actively eroding. Downstream in the west Valley, 25% of the banks were actively eroding. A strong association was found between levels of human use around campsites and river access points and the loss of riparian vegetation cover and accelerated bank erosion (Madej et al. 1991).

At the time of the river's designation, 11 historic bridges spanned the Merced River between Happy Isles and the Pohono Bridge. Hydraulic constrictions were especially pronounced at three arch bridges built in the 1920s: Stoneman, Sugar Pine, and Sentinel bridges (Madej 1991). Restrictive bridges cause eddy currents upstream and downstream that lead to bank erosion. Additionally, accelerated flows through the narrow opening have scoured the channel bed near bridges and resulted in bar formation downstream and river migration. Bridges also created hard points that anchored channel migration, preventing channel evolution. Some bridges, such as Sugar Pine Bridge, created such strong confinement that they appear to have increased the potential for channel avulsion by substantially eroding and widening naturally-occurring cutoff channels. The impacts of some of these bridges were exacerbated by the elevated road causeways leading to them, which intercepted and concentrated floodplain flows at high water.

Two dams and numerous utility crossings at the time of designation affected the Merced River's free-flowing condition.

- The Happy Isles Dam footing, a three-foot-high structure spanning the river, created a barrier to flow though it was no longer used to produce electricity or divert water.
- The Cascades Diversion Dam, a 17-foot-high structure about one mile downstream of Pohono Bridge, impeded the free-flowing condition of the river though it was no longer used for hydroelectricity since the mid-1980s. This decaying structure was removed in 2004.
- Utility lines crossed the riverbed at 13 locations, acting as small dams. The North Pines Lift Station at the confluence of the Merced River and Tenaya Creek also exacerbated riverbank erosion.

In Segment 4 at the time of designation, the Merced River near El Portal was confined by Foresta Road and associated abutments and riprap, which encroached into the historical channel bed in places. In El Portal, a small levee was located on the left bank of the Merced River, just downstream from the El Portal Road Bridge. This approximately 300-foot deflection bar protects the Trailer Village area from flooding. There is also a levee near the gas station and store. Other modifications to the river in Segment 4 include remnant rock diversions and the use of the Greenemeyer sand pit in the floodplain for sand capture and storage.

Bridges on the Merced River near El Portal included the El Portal Road Bridge and the Foresta Road Bridge. Neither bridge created significant impoundments that affected the free-flowing condition of the river.

In Segment 6 at the time of designation in the Wawona area, a small impoundment at the intake of Wawona's surface water supply was located near the end of Forest Drive. By the time of designation, the pool had filled with small cobbles, sands, and other sediments; however, this impoundment was not a major source of sediment and did not act as a significant barrier to river flow and dynamics.

In Segment 7 at the time of designation, Wawona bridges on the South Fork Merced River include the Swinging Bridge upstream of Wawona; the historic Wawona Covered Bridge, a timber-framed covered bridge; and the South Fork Bridge (Wawona Road). At the time of designation, the South Fork Bridge was a narrow bridge that has since been replaced. The original South Fork Bridge had unreinforced masonry cobble abutments and piers within the channel that affected the free flow of the South Fork Merced River and created local scour holes.

### *Current Condition*

In Segments 1 and 5, all structures that existed at the time of designation remain, including the diversion dam above Nevada Fall and several small footbridges. Water for domestic consumption at Merced Lake High Sierra Camp is taken directly from the Merced River. Such withdrawals constitute at most 0.5% of the river's flow, as determined from 2012 abstraction rates (one of the driest years in Yosemite history).

Segment 2 is the most complex stretch of the Merced River because it includes Yosemite Valley, which hosts the majority of Yosemite's current 4 million annual visitors. Segment 2, therefore, incorporates the most impacts and the greatest number of management actions taken since designation, as presented here:

- Localized riverbank restoration projects have been implemented since 1987 at Housekeeping Camp, North Pines Campground, Sentinel Bridge, former Lower River Campground, and the original El Capitan Picnic Area. In addition, the Happy Isles Dam was removed in 2004. Restoration techniques included soil decompaction, re-vegetation, bioengineering stabilization, riprap removal, and fencing installation. Through restoration, approximately 1,700 cubic yards of riprap have been removed from the Merced River's banks; 2,600 feet of biotechnical bank stabilization have been installed; and 15,000 feet of fencing have been installed (Cardno ENTRIX 2012). In addition, 13 utility lines have been removed from the riverbed, and the North Pines Lift Station has been removed from riverbanks at the confluence of the Merced River and Tenaya Creek. These actions

eliminated some impediments to the free-flowing condition of the river; however, the fundamental causes of channelization remains large wood removal from the channel, bank revetment (e.g. riprap), bridge confinement, and continued bank erosion.

- No hardened bank stabilization, such as riprap, has been installed since the 1987 designation. Although the installation of riprap in Yosemite Valley largely ceased in the early 1970s, more than 3,500 meters of riprap still line the edges of riverbanks and streambanks in Yosemite Valley. Since 1987, the river has undermined riprap in some locations, and bank erosion is occurring behind the lines of riprap in other locations.
- Under current conditions, large wood continues to be managed, although less aggressively than in 1987 conditions. Large wood is maneuvered to riverbanks in the designated rafting area from Stoneman Bridge to Sentinel Beach, a practice considered best management due to the presence of commercial rafting. In part due to this practice, Cardno ENTRIX found that in the upper reach wood loading had increased from 19 to 70 pieces per mile, while in the lower reach the load had increased from 47 to 97 pieces per mile. This increase was also attributed to bank erosion and wood recruitment resulting from the 1997 flood. Within Yosemite Valley, wood loading varies, with the highest levels found in the Happy Isles reach. In Yosemite Valley, large wood loading is likely still below levels found in comparable natural settings, with a level of approximately 26%-35% of that found in a similar study of unmanaged watersheds in the eastern Cascades (Cardno ENTRIX 2012).
- Yosemite Valley's historic bridges continue to constrict river flows, similar to constrictions at the time of designation. Following the 1997 flood, the Happy Isles Gauge Bridge was removed from the channel, and Sentinel Bridge was reconstructed upstream of its original location. Three historically significant arch bridges continue to produce major hydraulic constrictions during high water events: Sugar Pine, Ahwahnee, and Stoneman bridges. The elevated multi-use trail connecting Sugar Pine and Ahwahnee bridges exacerbates these effects. At Sugar Pine Bridge, the bridge's small opening diverts some river flow into a cutoff channel. Greater flow and a steeper slope in the cutoff channel has led to substantial widening since 1919, increasing the potential for avulsion of the main channel in this location. At other bridges—even some of the non-arch bridges like Housekeeping and Swinging bridges—large scour holes have developed. Constructed of multiple piers on top of fill in the river bottom, these bridges create a weir-like impact to free-flowing conditions. Superintendent's Bridge, similarly, disrupts flow and results in the formation of artificial rapids.
- The current condition of additional infrastructure, related to bridges, affects the free-flowing condition of the Merced River in Segment 2. This includes abutments still standing at the former Happy Isles footbridge and the Happy Isles Gauge Bridge. In addition, the Pohono Bridge gauging station, identified as critical infrastructure, could be relocated north outside the river's bed and banks.
- Riverbank erosion and widening in Segment 2 have continued to occur since the time of designation. Erosion has developed on the outside of meander bends, with the most significant location near Sentinel Beach Picnic Area. Channel widening also developed through erosion of both banks between Swinging Bridge and El Capitan Picnic Area and on the outer bends between El Capitan Picnic Area and El Capitan Meadow (Cardno ENTRIX 2012).
- Water for domestic consumption is pumped from three different wells in Yosemite Valley. Even though extraction rates approach 700,000 gallons daily in the summer (the period of greatest use), groundwater levels in Yosemite Valley show very little effect. This is most likely due to both to the aquifer's great depth (there is as much as 2,000 feet of sediment overlying bedrock in Yosemite Valley, so there is substantial water-holding capacity) and due to recharge from surrounding areas. Consequently, such water extraction has no impact on the river's free flow, on groundwater recharge in nearby meadow/riparian areas, or on downstream ecosystems (Newcomb and Fogg 2011).

In Segment 3, the Cascades Diversion Dam, a 17-foot-tall impoundment that backed up the river 200 feet, was removed in 2004, allowing the river channel to be restored to natural conditions. Also in Segment 3, the El Portal Road was partially rebuilt after it suffered significant damage during the 1997 flood (the Merced River eroded the road's embankments). About 7.5 miles of the roadway were rebuilt, with extensive riprap.

Segment 4 conditions in El Portal continue to be similar to those at the time of the river's designation. The river is confined by Highway 140 and revetment (riprap, for example), which in places encroach into the historical channel bed. The small deflection bar built to protect the Trailer Court still exists. Other free-flowing impediments include the El Portal Road berm, remnant rock diversions, and remnants of the Greenemeyer sand pit no longer used for sand capture. Water for domestic consumption is taken from three wells in the El Portal area. These wells do not appear to affect groundwater levels or those in the Merced River (which has substantially higher flows than it does in Yosemite Valley).

In Segments 6 and 7 in Wawona, the South Fork Bridge was damaged during the 1997 flood and replaced in 2006 with a new bridge without piers in the river channel. As established in the WSRA Section 7 determination process, an evaluation for direct and adverse effects by the new bridge found no significant impediment to the free-flowing condition of the river during most flow conditions. In addition, a water intake structure at Swinging Bridge, diverting water to the Wawona Water Treatment Plant, remains.

Water for domestic consumption in Wawona (Segment 7) is taken directly from the South Fork Merced River, in Segment 6. In most years, there is adequate flow for the withdrawals, but in dry years like 2012 river levels can reach critically low levels. In 1987, the NPS implemented the *Wawona Water Conservation Plan*, which set the rate of diversion from the Wawona water intake at 0.59 cubic feet per second (NPS 1987) (water is diverted for domestic and irrigation uses). To protect instream flows for aquatic habitat, the plan enacts mandatory water conservation whenever the river reaches flows of less than 6 cubic feet per second. At flows of less than 6 cubic feet per second, diversions were limited to 10% of the river flow. The plan adequately protects the river's aquatic invertebrates and other life forms during such drought years, but increases in such withdrawals could harm native fauna (Holmquist and Waddle 2012). All alternatives would continue the conservation plan.

In Segments 5 and 8, current free-flowing conditions remain the same as in 1987 at the time of river's designation. There are no human-caused impediments within the river channel.

### ***Management Program for Free-flowing Condition of the Merced River***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. The program to manage this river value identifies actions to address specific management considerations and a set of trigger points associated with management actions to maintain desired conditions. To prevent future impacts, the NPS would require all projects involving construction within the bed or banks of the river to undergo a Section 7 analysis as described in "Section 7 of WSRA—Determination Process for Water Resources Projects" (Chapter 4). The analysis would take place in advance of project implementation to ensure no adverse effects or degradation impacts occur on the free-flowing condition of the river.

### **Indicator - Impediments to Free-flowing Condition**

WSRA specifies guidelines for determining appropriate actions within the bed and banks of a Wild and Scenic River. Section 7 of the act restricts hydrologic and water resource development projects and directs managing agencies to specify a process to determine whether or not a proposed water resources project is appropriate. Chapter 4 articulates the Section 7 Determination Process for Water Resources Projects, as proposed in the *Merced River Plan/DEIS*. This process is used to ensure that the free-flowing condition of the Merced River is preserved, in lieu of a specific monitoring program.

### ***Management Standard***

The management standard for free-flowing condition shall be preservation of the river in its current state, with no additional structures or impediments to free-flow within the bed and banks of the river. The Wild and Scenic Rivers Act provides for existing structures, as of designation, to remain.

### ***Adverse Effect***

Adverse effects on the free-flowing condition of the Merced River are defined as an increase in the number of bridges or addition of riverbank riprap; an addition of water diversion structures, or otherwise modifying the waterway in such a manner that free-flowing condition is negatively affected.<sup>17</sup> The addition of any structure within the bed and banks of the river would trigger a Section 7 analysis under WSRA. This definition of adverse effect would allow the NPS to add or modify structures if absolutely necessary, but would trigger an analysis that assures these structures do not impact free-flowing condition. Consider a proposal, for example, to add riprap to support a washed-out section of trail through a narrow section of a canyon. If there is no alternate route for the trail that is feasible and the river is otherwise constrained by the topography, then addition of a short section of riprap may not be considered a substantial impact to free-flow. If, on the other hand, riprap is required to maintain the trail in a historic trail alignment, and the river has migrated into the trail corridor and further migration would be impeded by the addition of riprap, then this would be considered an adverse effect to free-flow or even degradation.

### ***Degradation Standard***

Degradation of the free-flowing condition of the Merced River is defined as the addition of any structure that constrains the movement of the river through avulsion or progressive migration. Additional structures exceed this minimum and would contribute to a degraded state of the river.

### ***Monitoring Free-flowing Condition***

Proposed park management actions (for example, projects involving construction, maintenance, and activities involving ground disturbance) are already regularly reviewed by subject-matter experts and park management at NPS's Monthly Planning Forum. At this forum, any project proposed within the bed and banks of the Merced River is mandated to complete a Section 7 determination process to ensure compliance with Section 7 of WSRA. Table 5-2 displays trigger points and Section 7 analysis response associated with free-flowing conditions.

**TABLE 5-2: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR FREE-FLOWING CONDITION**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> Proposed construction of a project within the bed or banks of the Merced River.	Section 7 analysis.	Such analysis is required by the Wild and Scenic River Act and would prevent adverse effects from occurring.

<sup>17</sup> Adverse effect and degradation are specifically defined for the Merced River (they are not for the Tuolumne River in the *Tuolumne River Plan/DEIS*) because the potential for new development in the Merced River corridor is substantially greater than it is in the Tuolumne River corridor. Specifically, the Merced River has considerably more existing impediments to free flow in Yosemite Valley, there are substantially more management actions proposed in the *Merced River Plan/DEIS* than in the *Tuolumne River Plan/DEIS*, and Yosemite Valley is not designated wilderness (where such wilderness boundaries closely approach the Tuolumne River, precluding such kinds of development in that area).

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached the trigger point identified in Table 5-2 above. There are no management concerns associated with the free-flowing condition river value.

### ***Management Considerations and Enhancement Actions***

Management considerations associated with this river value include the riverbank riprap, infrastructure within the bed and banks of the river, and bridges. The following actions would take place under Alternatives 2-6 to address these management considerations:

- ***Riprap revetment.*** Remove riverbank riprap to restore natural river processes. Replace riprap with native riparian vegetation and re-vegetate with riparian species (3,400 linear feet). Use bioengineering techniques where riverbank stabilization is necessary for infrastructure protection (2,300 linear feet) under Alternatives 2-6.
- ***Footings at the former Happy Isles footbridges.*** Remove former footings and river gauge base from the bed and banks of the Merced River. Re-vegetate denuded informal trails.
- ***Base of the former gauging station at Happy Isles.*** Remove the gauge base from the bed and banks of the Merced River. Re-vegetate denuded areas.
- ***Pohono Bridge Gauging Station.*** Move the gauging station north of the river outside of the bed and banks of the river. Re-vegetate denuded areas.

The *Merced River Plan/DEIS* considers a range of options to address bridge-related considerations. These options range from removal of three bridges under Alternatives 2 and 3 to retention of all historic bridges under Alternative 6:

- ***Alternative 2:*** Remove Stoneman Bridge and restore river banks to natural conditions. Redesign the intersection at Sentinel Bridge and convert Southside Drive to a two-way road. Remove the Sugar Pine and Ahwahnee bridges and the berm that connects them, and restore river banks to natural conditions. Re-route the multi-use trail north of the river.
- ***Alternative 6:*** Retain all historic bridges. Improve riverbank condition and increase channel complexity at Sugar Pine and Ahwahnee bridges through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and use of riverbank bioengineering techniques. Reduce the width of the cut-off channel associated with Sugar Pine Bridge by importing fill material, constructing log jams, and use of bioengineered bank stabilization techniques. If subsequent monitoring of riparian conditions reveals insufficient improvement (i.e. CRAM rating remains below 0.71) within 10 years of the implementation of these actions, more aggressive management action would be initiated, and the NPS would consider the removal of Sugar Pine Bridge.<sup>18</sup>

The NPS would remove Sugar Pine and Ahwahnee bridges in Alternative 4, and Sugar Pine Bridge in Alternative 5.

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<sup>18</sup> Strategically placed log jams diffuse and direct high velocity flows, a property that makes them a valuable tool to mitigate altered flow regimes around bridges. Log jams, unlike traditional rock revetment, reintroduce habitat complexity within the channel by creating additional bars and scour holes, and by providing cover for aquatic organisms (e.g. Abbe et al., 2003). When used in conjunction with the wood retention policy and other log jams designed to facilitate bar formation, riparian vegetation recruitment, and resultant channel narrowing, log jams used around bridges form part of a comprehensive restoration and mitigation strategy designed to improve the hydrologic function of the Merced River.



### ***Conclusion: Protecting and Enhancing Free-flowing Condition***

The free-flowing condition of the Merced River is determined to be absent of adverse effects, degradation, and management concerns, although management considerations are present. The *Merced River Plan/DEIS* proposes actions to address specific considerations including removing riprap and removing unnecessary infrastructure in the river channel under Alternatives 2-6. Alternatives 2-6 consider a range of options to address bridge-related impacts in Segment 2, Yosemite Valley. The actions range from complete removal of selected bridges, to retention of bridges and use of design and engineering techniques such as constructed log jams to improve riverbank conditions and increase channel complexity near bridges. To prevent future impacts, the NPS would require all projects involving construction within the bed or banks of the river to undergo a Section 7 analysis. The analysis would take place well in advance to ensure that no adverse effects or degradation impacts occur on the free-flowing condition of the river.

### **River Value: Water Quality**

<b>River Value: Water Quality</b>
<b>Location:</b> All Segments of the Merced River
<b>Management Objective:</b> Maintain exceptional water quality on all segments of the Merced River within Yosemite National Park and the El Portal Administrative Area.

### ***Condition at Time of Designation (1987)***

The U.S. Geological Survey (USGS) began ongoing monitoring of Merced River water-quality constituents at the Happy Isles gauge in 1968. At the time of river's designation in 1987, the USGS continued to monitor the Happy Isles gauge. Then, in 1994, the NPS published a comprehensive water quality report, which established baseline water-quality data for the Merced River. The overall water quality of the river was exceptionally high, with relatively few impacts caused by development and visitor use. Water quality in the South Fork Merced River above Wawona was characterized as high, while generally low in nutrients, salts, and suspended sediment, and high in dissolved oxygen. Only minor impacts from human activities were indicated (NPS 1994). Although limited data has been collected for the Merced River above Nevada Fall, the available information documented high water quality (Clow et al. 1996).

### ***Current Condition***

Current water quality in all Merced River segments is high, with most water quality sampling results near natural background levels. Water samples collected near Sentinel Bridge and Pohono Bridge showed higher bacteria levels than elsewhere in the watershed, but even those levels were well below public health limits (Clow et al. 2011). Nutrient concentrations are very low and have been for similar undeveloped areas (Brown and Short 1999; Clow et al. 2011). Some Yosemite Valley samples (9%-14%) indicated trace amounts of petroleum hydrocarbons (Peavler et al. 2008), most likely a result of stormwater runoff from parking lots and roads. Petroleum hydrocarbon concentrations, when detected, were well below the State of California water-quality limits. Higher water temperatures may result from a wider channel with less shading vegetation on the banks. Higher temperatures can result in decreased dissolved oxygen concentration.

## ***Management Program for Water Quality***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program.

### **Indicators of Water Quality**

The following variables related to water quality can be tied to human contact with water:

- Nutrient levels (total dissolved nitrogen, total phosphorus, nitrate plus nitrite, and total dissolved phosphorous)
- Total petroleum hydrocarbons
- *E. coli* (The State of California has proposed replacing the general fecal coliform indicator with *E. coli* as a more direct indicator of human disease potential. Adoption is on hold until the U.S. Environmental Protection Agency finishes a court-mandated review of bacteriological criteria, due October 2012. Given the likelihood that state standards will change, the NPS is adopting *E. coli* rather than fecal coliform as an indicator of water quality.)

### ***Management Standard***

The management standard for water quality shall be anti-degradation of the indicator condition from a baseline established in 2004-2008. Site-specific management targets are exceeded when annual sampling (nutrients and *E. coli*, respectively) exceeds the 95% upper confidence limit of the baseline condition (75th or 50th percentile) in greater than one in five years. Similarly, the standard for petroleum hydrocarbons is exceeded when hydrocarbons are detected in greater than one in five years.

Water quality criteria for the upper Merced River are established by the California Water Control Board through the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. The Water Quality Control Plan adheres to the federal Anti-degradation Policy (40 CFR 131.12) by stating: "Chief among the State water policies for water quality control is State Water Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California). It requires that wherever the existing quality of surface or ground waters is better than the objectives established for those waters in a basin plan, the existing quality would be maintained unless as otherwise provided by Resolution No. 68-16 or any revisions thereto."

### ***Adverse Effect***

An adverse effect would be either of the following:

- Exceedance of the draft EPA's bacteriological criteria for water contact recreation *E. coli* one-day standard of 235 MPN/100ml (Most Probable Number of bacterial colonies per 100 milliliters) and subsequent exceedance of the 90-day geometric mean standard of 126 MPN/100ml. Exceedance of the bacteriological standard indicates a persistent contamination problem beyond normal flushing rainstorms that would result likely in a violation of state water-quality standards (protecting the designated use of Merced River waters for recreation).
- Exceedance of EPA Maximum Contamination Level for nitrate+nitrite of 10 mg/l (milligrams of nitrate and nitrite expressed as the weight of elemental nitrogen). Exceedance of the Nitrate+Nitrite criteria would be a violation of state water-quality standards as applied to municipal water sources. Waters designated for municipal use must also adhere to California drinking water regulations (Title 22), which include the EPA's Maximum Contaminant Limit for Nitrate+Nitrite. Levels of Nitrate+Nitrite, currently within Yosemite, are 10-100 times lower than this Maximum Contaminant Limit.

### Degradation Standard

Degradation is defined as the inclusion of any Merced River segment on the federal Section 303d (Clean Water Act) listing of waters not attaining minimum water quality objectives. For the Merced River and the chosen water quality indicators, this will occur when there are 10 or more exceedances of the EPA's water quality standards over the course of the 303d reporting period of three years.

States are mandated "to identify waters that do not meet applicable water quality standards with technology-based controls alone and prioritize such waters for the purposes of developing Total Maximum Daily Loads (TMDLs)," according to California State Water Resources Control Board.

### Monitoring Water Quality

The Merced River's water quality, as measured by nutrient levels and *E. coli*, would be measured at six locations and petroleum hydrocarbons at three of those six locations (noted with asterisks):

- Merced River above Nevada Fall
- Merced River above Happy Isles Bridge
- Merced River above Pohono Bridge\*
- Merced River below Foresta Bridge\*
- South Fork Merced River above Swinging Bridge
- South Fork Merced River below Wawona Campground\*.

The monitoring protocol is available as a part of the overall Visitor Use and Impacts Monitoring program field guide: <http://www.nps.gov/yose/naturescience/upload/Visitor-Use-Monitoring-Guide-v1-0-2010.pdf>. In addition, Table 5-3 displays trigger points related to water-quality conditions and management response.

**TABLE 5-3: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR WATER QUALITY**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> Statistically significant upward trend in concentration of any of the indicator analyses at any one monitoring site.	Initiate investigation of water quality conditions in the area of consideration to identify potential point source.	These standards indicate possible deterioration of water quality. Steps taken here are focused on determining the persistence and source of the problem and whether more serious investigation and action are required to resolve the issue.
Trigger Point 2: Exceedance of proposed USEPA bacteriological criteria for water contact recreation <i>E. coli</i> one-day standard of 235 MPN/100ml at any one monitoring site in 2 consecutive monthly samples.	Initiate weekly sampling of <i>E. coli</i> at sites exceeding the limit until sample concentration falls below single sample limit (235 MPN/100 ml). Assure at least 5 samples are taken over the course of the 90 days following the first exceedance in order to determine 90-day geometric mean to determine adherence to proposed <i>E. coli</i> standard. If the geometric mean is greater than the 90-day standard of 126 MPN/100ml, a subsequent investigation shall take place.	This trigger point indicates potential violation of a state (and EPA) water quality standard. Subsequent prescribed sampling would determine whether the event was one time only or more persistent (more serious) in nature.

**TABLE 5-3: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR WATER QUALITY**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Points 1 or 2</b>	<p>These actions may be taken for either trigger point above, depending on the type of impact:</p> <ul style="list-style-type: none"> <li>• Increase educational messaging regarding water quality.</li> <li>• If impacts are related to human waste (and where allowed by management objectives), provide toilet facilities.</li> <li>• If impacts result from erosion, improve conditions through restoration, trail rerouting, etc.</li> <li>• If impacts result from stock use, redirect/ reduce/limit stock use in certain areas.</li> <li>• Increase enforcement of permit requirements.</li> <li>• Increase ranger patrols in river areas to protect water quality and educate users.</li> <li>• Close some areas temporarily or permanently.</li> </ul>	<p>Actions may be initiated during or after the investigations listed under either trigger point to protect water quality and human health.</p>

Source: Environmental Protection Agency

### *Management Concerns and Protective Actions*

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-3. There are no management concerns associated with the water quality river value.

### *Management Considerations and Enhancement Actions*

Management considerations pertaining to this river value include water quality related to the impacts of automotive fluids and surface water runoff; potential hazards related to dump stations, septic tanks, and leach fields; and accelerated erosion and potential sediment loading in the Merced River. While water quality in the Merced River meets standards, the Secretarial Guidelines (USDI and USDA 1982) direct managing agencies to maintain or, where necessary, improve water quality to levels that meet federal criteria or federally approved state standards in Wild and Scenic River areas. The following actions proposed in the *Merced River Plan/DEIS* would take place to address these issues:

- **Wawona Impoundment:** Alternatives 2-6 would retain the current water collection and distribution system, and continue to implement the Water Conservation Plan related to the minimum flow analysis for the South Fork. Abandoned infrastructure (not related to the water collection and distribution system) would be removed from a side channel of the South Fork Merced River.
- **Pack Trail from Concessioner Stables in Yosemite Valley to Happy Isles:** Alternatives 2 and 4 would remove the pack trail along the Merced River and restore the area to natural conditions, as the Concessioner Stables would be removed. Alternatives 3 and 6 would re-route the pack trail to the north along the road where the stock trails converge with the Valley Loop Trail.
- **Odger's Fuel Storage Facility:** Alternatives 2-6 would remove and relocate the facility out of the 500-year floodplain.
- **Yosemite Village Day-use Parking Area:** Alternatives 2 and 3 would move the parking area north of its current location and closer to the Village Center. Northside Drive would be rerouted south of the parking area, outside the 10-year floodplain. The NPS would restore meadow and floodplain communities. Under Alternatives 4, 5, and 6, parking would be moved north to about 150 feet away from the ordinary high-water mark. The NPS would riparian habitat adjacent to the river.

- **Parking Areas:** Move parking lots away from the river and/or construct stormwater run-off mitigation measures that incorporate best management practices.
- **Upper Pines RV Dump Station:** Alternatives 2-6 would relocate dump station away from the river to a site between Curry Village and the entrance to the Pines Campgrounds.
- **Wawona RV Dump Site:** Alternatives 2-6 would relocate the dump site to an appropriate location away from the river.
- **Waste Water Collection System for the Wawona Campground:** Alternatives 2-6 would remove the current septic system and develop a waste water collection system. The NPS would build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant.

Actions to address accelerated riverbank erosion and potential sediment loading are described under Geological/Hydrological ORV 7— the Merced River in Yosemite Valley as an outstanding example of a rare, mid-elevation alluvial river.

### ***Conclusion: Protecting and Enhancing Water Quality***

The Merced River’s water quality is determined to be absent of management concerns, adverse effects, or degradation, although management considerations are present. To remedy these considerations, the *Merced River Plan/DEIS* proposes to continue to implement a water conservation plan for Wawona, including minimum flow thresholds; re-route the stock trail between Happy Isles Bridge and Clark’s Bridge for stock use; and move parking lots away from the river and/or construct stormwater run-off mitigation measures that incorporate best management practices.

The plan would consider options to relocate the Upper Pines and Wawona RV dump stations, develop a wastewater collection system for the Wawona Campground to minimize water use and discharge, To preserve water quality in the future, the NPS would monitor the condition of water quality, and take specific actions should specific trigger points be reached. These trigger points are selected to inform managers well in advance of adverse effects or degradation impacts on water quality.

## **BIOLOGICAL ORVs**

This section describes the program to protect and enhance each Biological ORV as proposed in the *Merced River Plan/DEIS*. Three Biological ORVs exist in the Merced River corridor, each related to specific segment(s) of the river (Table 5-4).

**TABLE 5-4: BIOLOGICAL ORVs AND ASSOCIATED INDICATORS**

<b>ORV Number and Key Resource</b>	<b>Segment(s)</b>	<b>Indicator to be Monitored through Time</b>
1. High-elevation meadows and riparian habitat	1 and 5	1. Meadow bare soil 2. Meadow fragmentation resulting from proliferation of informal trails 3. Streambank stability
2. Mid-elevation meadows and riparian communities in Yosemite Valley	2	1. Meadow fragmentation resulting from proliferation of informal trails 2. Status of riparian habitat 3. Riparian bird abundance
3. Sierra sweet bay population in the Wawona area	7 and 8	1. Population decline

## Biological ORV—High-elevation Meadows and Riparian Habitat

**ORV 1—The Merced River sustains numerous small meadows and riparian habitat with high biological integrity.**

**Location:** Segment 1 (Merced River above Nevada Fall) and Segment 5 (South Fork Merced River above Wawona)

**Rationale:** Numerous small meadows and adjacent riparian habitats in this high-elevation environment owe their existence to the river and its annual flooding. The meadows and riparian habitat are exemplary in their intact condition and the great diversity of plant and animal species they support.

**Management Objective:** Manage human use in meadows and riparian habitat within the Merced River corridor to maintain high ecological condition; minimize habitat fragmentation; and protect the integrity of streambanks to conserve ecosystem processes associated with meadow and riparian function.

### *ORV Condition at the Time of Designation (1987)*

Meadow conditions in 1987 at the time of designation were likely similar to conditions of today, with some exceptions. At the time of designation, the NPS allowed the concessioner to graze its pack stock at Merced Lake-West Meadow and Merced Lake-Shore Meadow, and trampling and grazing impacts were reportedly widespread and severe in these areas (Sharsmith 1961). In the early 1990s, the NPS closed these meadows to grazing. In general, the drier, upland edges of subalpine meadows in the Sierra Nevada became more forested during the last century. A comprehensive study by Millar et al. (2004) determined that this occurred during a “single distinct climatic pulse” that occurred from 1946 to 1975, when the weather was warm and dry with little annual variability and conditions fostered pine seed germination. Historic sheep grazing (Sharsmith 1959; Dunwiddie 1977) and fire suppression (DeBenedetti and Parsons 1979) are also implicated in conifer invasion in meadows. Pack stock grazing and fire suppression that occurred between 1946 and 1975 may have contributed to the forest invasion by adding more stress to grazed meadow plants. It is difficult to ascertain the extent, timing, or causes of this historic forest spread in specific subalpine and alpine reaches of the Merced River corridor due to a lack of studies and lack of consistent documentation of conifer removal activities in the past 150 years (Ballenger et al. 2011).

### *Current ORV Condition*

In 2010, park personnel evaluated the condition of high elevation and subalpine meadows of the Merced River corridor. Most meadows reflected high ecological integrity, with the exception of some site-specific impacts. Alpine meadows displayed little to no impacts from visitors or pack stock, with the exception of braided and rutted formal trails in several meadows along the Red Peak and Triple Peak Forks (Ballenger et al. 2011). No stock impacts or informal trails were observed in alpine meadows in the river corridor (Ballenger et al. 2011). Subalpine meadows displayed site-specific negative impacts. For example, Merced Lake - East Meadow exhibited very low vegetation cover and high bare-ground levels associated with several years of administrative pack stock grazing. Researchers documented extensive informal trails at two subalpine meadow sites—Merced Lake - Shore and Merced Lake - East Meadow (Ballenger et al. 2011).

## ***Management Program for ORV 1***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. The NPS conducted a widespread condition assessment for meadows in Segment 1 in 2010 (Ballenger et al. 2011). This study evaluated every meadow in the corridor in its entirety, using assessment protocols tailored to different elevations. In subalpine meadows, the study evaluated over 30 different metrics associated with meadows. In alpine meadows, the study focused on coarse composition of vegetation and substrate, and plant communities. In subalpine sites, the study assessed streambank and channel condition using an interagency protocol (Burton et al. 2011), and in alpine sites, the study used a rapid assessment protocol.

This condition assessment provided a foundation to focus meadow monitoring in Segment 1 on areas of special concern. Three distinct indicators were selected to monitor meadow conditions through time. The indicators are: (1) bare soil cover in meadows, (2) fragmentation of meadow habitats as a result of proliferation of informal trails; and (3) physical streambank stability. The NPS is currently testing a pilot monitoring protocol to precisely monitor the bare ground indicator in Segments 1 and 5.

### **Indicator 1 – Meadow Bare Soil for ORV 1**

The amount and distribution of bare soil is considered an important indicator of meadow integrity as it directly relates to site stability and susceptibility to wind and water erosion (Smith and Wischmeier 1962; Morgan 1986; Benkobi et al. 1993; Blackburn and Pierson 1994; Gutierrez and Hernandez 1996; Cerda 1999). Researchers have linked grazing activities to increases in bare soil as well as decreased plant cover, decreased primary productivity, and shifts in species composition (Miller and Donart 1981; Trimble and Mendel 1995; Olson-Rutz et al. 1996; Fahnestock and Detling 2000; Cole et al. 2004). Trampling, by either humans or stock, can produce similar results (Cole 1995; Liddle 1975, 1991) with the added impact of soil compaction that compromises root growth and water infiltration (Gilman et al. 1987; Unger and Kaspar 1994; Pietola et al. 2005).

Candidate metrics for monitoring ecological condition in meadows subject to grazing and/or trampling pressures include vegetative cover, bare soil, species composition, and meadow productivity. Bare soil and basal vegetative cover are more sensitive indicators of meadow condition than species composition (Cole et al. 2004). For instance, bare soil increases at lower levels of disturbance compared with shifts in species composition in a variety of montane vegetation types of North America (including alpine meadow) (Cole 1993). Plant productivity may be more sensitive to grazing pressure than bare soil (Cole et al. 2004), but this measure may be impractical to monitor in Wilderness meadow settings. Furthermore, plant productivity is subject to high interannual variability resulting from climatic factors, such as precipitation (Walker et al. 1994), snowpack, or snowmelt (Walker et al. 1995). In addition to its relevance for monitoring meadow condition, bare soil measured from point data is efficient, objective, easily obtained, and repeatable across time and observers. Therefore, bare soil may be one of the most robust indicators of changes in meadow ecological condition.

Weixelman and Zamudio (2001) generated low, moderate and high ecological condition classes for bare soil cover values based on monitoring data from a comprehensive multi-year study in U.S. Forest Service meadows in the Sierra Nevada range (Table 5-5). These values were used to inform condition class development in Yosemite; however, the park may further refine condition classes based on monitoring data collected in Yosemite (protocol in development). These data will be collected from meadows with visitor

and pack stock use as well as meadows with no to low use levels and provide reference sites to discern changes in condition unrelated to human use or management actions. The monitoring approach may also include collecting information on meadow characteristics and human use to have an empirical basis for assessing bare soil causal factors. A specific approach would be determined during monitoring design.

**TABLE 5-5: BARE SOIL COVER VALUES FOR ECOLOGICAL CONDITION CLASSES AMONG SIERRA NEVADA MEADOW TYPES (FROM WEIXELMAN ET AL. 2003)**

Meadow type	High Condition	Moderate Condition	Low Condition
<b>Montane</b>			
Hydric meadow	0-4%	5-9%	>9%
Mesic meadow	0-6%	7-13%	>13%
Xeric meadow	0-8%	9-13%	>13%
Temporarily flooded	TBD	TBD	TBD
<b>Subalpine</b>			
Hydric meadow	0-4%	5-8%	>8%
Mesic meadow	0-6%	7-13%	>13%
Xeric meadow	TBD	TBD	TBD
Temporarily flooded	TBD	TBD	TBD
NOTE: The montane zone is 4,000 to 8,000 feet in elevation and the subalpine zone is 8,000 to 9,500 feet in elevation			

### *Management Standard*

To meet the management standard for meadow bare soil, at least 75% of sites monitored in the river segment would have bare soil cover values within the range of high ecological condition, and no more than 15% of sites in low ecological condition (Weixelman and Zamudio 2001).

The values for bare soil cover that define ecological condition classes would vary according to meadow type and elevation (Table 5-5). For example, to be in a high condition class, a moist meadow would not have bare soil exceeding 6%, and a wet montane meadow (5,000-8,000 feet [1,500-2,400 meters]) would not have bare soil exceeding 4%. One meadow may contain up to 3 meadow types (wet, moist and dry), each of which would be sampled as an independent unit (a “site”) and its values for condition class applied respectively. In order to determine whether the standard would be met at the segment-wide level, a percentage of sites in each low, moderate and high condition classes would be calculated.

The NPS based these management standards on data and recommendations from the U.S. Forest Service Region 5 (California) Range Monitoring Project. This project has been monitoring bare soil in relation to livestock use in Sierra Nevada meadows for 12 years (Weixelman 2009).<sup>19</sup> Ecological condition classes for bare soil values are based on point-intercept data collected from 363 meadows across a broad disturbance gradient (Weixelman and Zamudio 2001).

<sup>19</sup> There are no known standards for bare soil in published academic literature.



### ***Adverse Effect***

Adverse effects would be indicated when bare soil cover values are twice the bare soil cover value for low ecological condition (regardless of meadow type) in at least 40% of the sites in a river segment. For example, a subalpine wet meadow with double the bare soil cover value (as measured by point-intercept data) would have >16% bare soil cover. If a river segment contained 50 monitored sites, an adverse effect would be present if there were more than 20 sites with such a doubling of their respective bare ground cover values.

The condition ratings in Weixelman and Zamudio (2001) provide ecologically meaningful ranges for bare ground values that were derived from analyzing meadow data from the Sierra Nevada. This condition class approach provides a way to distinguish adverse effect from minor fluctuations in the amount of bare soil. Increases in bare soil that result in a values at double the low condition rating for more than 40% of meadow sites in a river segment would signify a more significant decline than a minor, short-term fluctuation in one meadow.

### ***Degradation Standard***

Degradation would be indicated when bare soil cover values are twice the bare soil cover value for low ecological condition (regardless of meadow type) in at least 80% of the sites in a river segment. For example, a subalpine wet meadow with double the bare soil cover value (as measured by point-intercept data) would have >16% bare soil cover. If a river segment contained 50 monitored sites, an adverse effect would be present if there were more than 40 sites with such a doubling of their respective bare ground cover values.

The ecological processes that sustain meadows are integrally tied to plant composition, vegetative structure, and soil stability. A meadow in low ecological condition would have a predominance of shallow- and tap-rooted species, lower vegetative cover, and a greater extent of bare soil. High amounts of bare soil indicate low meadow productivity and greater susceptibility to erosion. Bare soil amounts of the magnitude described above, widespread across meadows in a river segment, would likely indicate that the processes sustaining meadow function are in jeopardy within that segment of the Merced River corridor.

### ***Monitoring – Meadow Bare Soil***

The NPS is collaborating with the University of California-Berkeley and the University of Arizona to develop a protocol to monitor meadow bare soil cover. Together they completed a draft monitoring protocol and collected pilot data from representative meadow types in summer 2012. They will further refine the protocol based on pilot data results and will implement the protocol in meadows of concern and reference meadows in summer 2013.

Monitoring would occur in Segment 1 above Nevada Falls (e.g., Merced Lake, Washburn Lake, Lyell Fork) and in Segment 5 on the South Fork Merced River above Wawona (Moraine Meadow and meadows upstream of Moraine Meadow, for example). The NPS would evaluate meadows of concern as well as reference meadows within the Segments 1 and 5. As the protocol develops, specific meadows of concern will be identified for monitoring. Reference sites (meadows with little to no visitor or stock use) will also be monitored as needed to provide a comparison with meadows of concern. Every five years, NPS staff will re-evaluate which meadows in the corridor are in need of monitoring. The NPS would evaluate the effectiveness of the indicators on a regular basis to assure that the combination of these metrics fully protect ORV 1.

Bare soil amounts vary among meadow vegetation types and elevation zones. This variability is addressed by different values to define ecological condition for dry, moist, and wet meadows (Weixelman and Zamudio

2001). Temporarily flooded meadow types may also contribute to greater variability in bare soil cover than other wet meadows (NPS unpublished data). This variability may necessitate the development of bare soil standards for temporarily flooded meadows during the early portion of the monitoring program.

The recommended monitoring interval for bare soil is three to five years unless the amount of bare soil exceeds a management trigger, prompting an increase in monitoring frequency. A subset of sites may receive annual monitoring to obtain estimates of inter-annual variation. Monitoring may occur any time between meadow flowering and first snowfall. Table 5-6 displays the trigger points at which actions would be taken to maintain meadow condition well above the management standard. These trigger points are focused on both site-level and segmentwide conditions. Responses are taken at the individual meadow level; this is necessary to avoid a downward trend segment-wide that may be difficult to mitigate at that scale.

**TABLE 5-6: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR HIGH-ELEVATION MEADOWS (BARE SOIL)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> Bare soil indicates low ecological condition at any monitored site. OR less than 90% of monitoring sites within a river segment are rated in high ecological condition for bare soil.	Apply a secondary assessment method (e.g., California Rapid Assessment Method [CRAM, CWMW 2009]) for a qualitative evaluation of meadow condition.	Rapid assessments are diagnostic tools that provide standardized, rapid, field-based assessments of the overall condition or functional capacity of meadows. Assessing meadow condition would aid in identifying key stressors that may be affecting meadow condition. Assessment results would assist with interpretation of monitoring results. CRAM, for example, has undergone extensive peer review, and it performs well when compared with fine-scale quantitative condition assessments (Stein et al. 2009). A version of CRAM tailored to wet meadows is in development; it is best used in combination with quantitative measures (M. Denn, NPS, pers. comm.)
	Increase education about BMPs in meadows for all who use them.	Education in maintaining meadow condition would help prevent further increases in bare soil associated with human use.
<b>Trigger Point 2:</b> Bare soil indicates low ecological condition at any monitored site for two monitoring periods AND secondary assessment method indicates use is a stressor. OR less than 90% of monitoring sites within a river segment are rated in high ecological condition for bare soil.	Increase education about Best Management Practices in meadows for Wilderness visitors, park staff, and park partners.	Education in maintaining meadow condition would help prevent further increases in bare soil associated with human use.
	Work with Stakeholders to develop strategies for timing of use, then reducing use if needed to minimize impacts. Work with stakeholders to adjust use levels annually.	Determining effective strategies with stakeholders for managing meadow use is a necessary step in the process to protect and enhance meadow condition.
	Increase monitoring frequency: Monitor annually for 5 years and adaptively manage use levels based on monitoring results.	Frequent monitoring would help facilitate more rapid detection of, and management response to, changes in ecological condition. Its utility would be to evaluate the effectiveness of changes in the intensity and/or timing of use on meadow condition.
	Rest the meadow if necessary: temporarily discontinue grazing until conditions improve based on secondary assessment results. Establish a preliminary grazing capacity or adjust grazing capacity.	Allowing a period of meadow "rest" (removing stresses from grazing and/or trampling) has been shown to facilitate meadow recovery. Effects of trampling and grazing that are expected to decline with reduced use or avoidance of early-season use include soil compaction, bare ground exposure, and plant disturbance. Grazing capacities are estimates of use levels that can be sustained in a meadow based on available forage cover, productivity and site condition which can guide in setting an appropriate level of use.

**TABLE 5-6: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR HIGH-ELEVATION MEADOWS (BARE SOIL)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 3:</b> Less than 80% of monitoring sites within a river segment are rated as high condition or greater than 15% of sites in low ecological condition OR Bare soil is double the value of low ecological condition class at a site OR Previous management actions (such as reduction in use) have been ineffective OR Assessments for 5 years have not shown improvement in ecological condition	Apply a secondary assessment method (e.g., California Rapid Assessment Method [CRAM, CWMW 2009]) for a qualitative evaluation of meadow condition.	Rapid assessments are diagnostic tools that provide standardized, rapid, field-based assessments of the overall condition or functional capacity of meadows. Assessing meadow condition would aid in identifying key stressors that may be affecting meadow condition. Assessment results would assist with interpretation of monitoring results. CRAM, for example, has undergone extensive peer review, and it performs well when compared with fine-scale quantitative condition assessments (Stein et al. 2009). A version of CRAM tailored to wet meadows is in development; it is best used in combination with quantitative measures (M. Denn, NPS, pers. comm.)
	Rest the meadow: temporarily discontinue grazing until conditions improve based on secondary assessment results. Establish a preliminary grazing capacity or adjust grazing capacity.	Allowing a period of meadow “rest” (removing stresses from grazing and/or trampling) has been shown to facilitate meadow recovery. Effects of trampling and grazing that are expected to decline with reduced use or avoidance of early-season use include soil compaction, bare ground exposure, and plant disturbance. Grazing capacities are estimates of use levels that can be sustained in a meadow based on available forage cover, productivity and site condition which can guide in setting an appropriate level of use.
	Increase monitoring frequency.	Frequent monitoring would help facilitate more rapid detection of, and management response to, changes in ecological condition. Its utility would be to evaluate the effectiveness of changes in the intensity and/or timing of use on meadow condition.

## Indicator 2 – Meadow Fragmentation Due to Proliferation of Informal Trails for ORV 1

This indicator encompasses fragmentation of high elevation meadow habitat due to the proliferation of informal trails. (The NPS will also use this indicator to monitor meadow conditions in Yosemite Valley as described in the next section.) Informal trails or social trails are tracks created by visitors or administrative use that are noticeable to observers and generally not managed directly by park staff, as opposed to formal trails that are mapped, periodically assessed, and maintained (Leung et al. 2002, 2011b). Various informal trail metrics have been commonly used as indicators of visitor-caused impacts throughout federal land management agencies, including other parks like Mount Rainier and Acadia (Kim and Daigle 2011; Rochefort and Swinney 2000), due to representation of impacts to both social and ecological conditions (Leung et al. 2011b; Monz and Leung 2006). Informal trail management has been found to be more difficult in subalpine environments where recovery rates are slow (Eagan et al. 2004; Kim and Daigle 2011).

The NPS selected this fragmentation-related indicator for this ORV because of its sensitivity in detecting spatial changes and thus protecting the pristine quality of large areas of intact meadow. In studies of trail impacts outside of meadow environments, researchers identified disturbance to vegetation and soils within one to three meters of the trail’s edge (Dawson et al. 1974; Dale and Weaver 1974; Leung et al. 2011c). Research within meadow environments has demonstrated that impacts from trails can extend beyond the direct impacts on trails and can have sizeable impacts radiating from the trail’s edge into the meadow (Holmquist 2004). The degree of fragmentation reflects the potential for impacts to meadow hydrology, habitat quality, soil moisture, and the introduction of non-native species (Forman 1995, Leung et al. 2011c; Lindenmayer and Fischer 2006). Trail corridors have also been shown to pose barriers for small mammals and other wildlife (Knight 2000; Miller et al. 1998; Gaines et al. 2003).

Although fragmentation is commonly used to measure impacts on the landscape scale, park managers and scientists at Yosemite and other public lands have used these metrics to assess impacts from recreation in the form of tracks and informal trails (Kutiel 1999; Leung et al. 2011b; White et al. 2011; Wimpey and Marion 2011). Investigation of trampling impacts in Yosemite Valley meadows demonstrates that meadow condition is poorer in heavily used areas, smaller areas are more prone to difficulties with recovery than larger areas, and visitor-created trampling has a significantly negative impact on vegetation and macroinvertebrate structure and diversity (Holmquist 2004; Leung et al. 2011a; Holmquist and Schmidt-Gengenbach 2008; Foin et al. 1977).

As fragmentation exists as a proxy for the aforementioned impacts, a fragmentation measure known as the Largest Patches Index –5 (LPI<sub>5</sub>) would be used to measure level of fragmentation. Adapted from the concept of Largest Patch Index (Table 5-7) (McGarigal and Marks 1995), this index derives from the sum of areas of the five largest patches without informal trails divided by total landscape (meadow) area and then multiplied by 100. The resulting percentage indicates the extent to which the meadow area is divided (fragmented) owing to the existence of visitor-created trails. If no trails are present, the total index value would be 100%. The main purpose of grouping the five largest patches, instead of evaluating the single largest patch, is to reduce the index's over-sensitivity to changes in one single patch. Just as parks such as Mount Rainier have found variations of this metric best suited to their meadow system (Moskal and Halabisky 2010), Yosemite park staff and collaborators also considered the three largest and 10 largest patches (LPI<sub>3</sub>, LPI<sub>10</sub>), ultimately determining that five best achieved a balance between simplicity and representativeness for Yosemite's meadows.

**TABLE 5-7: LARGEST PATCHES INDEX (LPI<sub>5</sub>) – YOSEMITE VALLEY MEADOWS**

Meadow	2006	2007	2008	2009	2010	2011
Ahwahnee		96.97			98.37	
Bridalveil		96.59			99.25	
Cooks A	93.84		75.53	80.05	78.63	86.19
Cooks B	99.10		98.20			99.34
Cooks C			99.09			95.04
El Capitan	87.24		83.47	78.18	78.01	79.23
Leidig		63.06		95.89	82.37	86.95
Sentinel A		92.58			93.55	
Sentinel B		98.37				99.90
Slaughterhouse A	98.60		98.27			86.86
Slaughterhouse B	99.02		99.31			99.74
Stoneman A	99.62	99.30	99.37	99.29	98.99	98.92
Stoneman B	99.71	99.90	99.81	99.91	99.94	99.84
Weighted Mean LPIs (Using Most Recent Data)						90.98

### *Management Standard*

The fragmentation standard (LPI<sub>5</sub>) for the montane and subalpine meadow complexes within segments 1, 2, and 5 of the Merced River corridor is a weighted mean of 93% for each segment, with no individual meadow less than 90%. The sum of the five largest intact patches for each selected meadow within the segment should be greater than or equal to 93%, as represented as a weighted mean, with no individual meadow less than 90%. The weighted mean values are selected by determining each individual meadow size relative to the total meadow area within each segment. Because the overall size of the meadow complex is a key component of the meadow ORV, using a weighted mean ensures protection for the integrity and overall extent of individual meadows and the full complex within each segment.

A group of subject matter experts determined this standard based on data from meadows throughout Yosemite (not just those in the Merced River corridor) that experienced elevated visitation levels, reduced vegetation cover, and an increased occurrence of invasive species. As there are no specific standards established for this metric in the literature, subject matter experts turned to two information sources to determine the appropriate standard for meadow fragmentation in the Merced River Corridor. First, they considered the fragmentation values recorded for several years in meadows both in the Merced and in the Tuolumne Corridors (since 2008). Meadows found to exhibit LPI<sub>5</sub> values below 90% were meadows with restoration needs and potential threats to biodiversity, soil erosion, and increased fragmentation. Conversely, meadows that were fully protective of species biodiversity, overall ecological integrity, and meadow hydrology (the fundamental components of this ORV) had a higher fragmentation standard, 93%. Second, the subject matter experts also performed a GIS analysis to determine the range of LPI<sub>5</sub> values expected to be found after management actions outlined in this plan are implemented. Another part of this second analysis was to consider the potential *impacts* that could incur alongside all of the proposed *actions* in the plan, such as expanding a campground next to a meadow. This second, two-pronged analysis determined that the fragmentation level (the LPI<sub>5</sub>) would be 93%. Through these two analyses, then, park managers determined that the meadow fragmentation management standard of 93% would both protect this ORV and be attainable for the Yosemite Valley meadows.<sup>20</sup>

### *Adverse Effect*

An adverse effect would be indicated at the segment level, when the weighted mean for the total meadows within one segment has dropped below an LPI<sub>5</sub> threshold of 81% for three consecutive years of annual assessments despite management actions to improve the connectivity and overall health of the meadow. Owing to fluctuations that are possible from year to year, specific precipitation patterns would be evaluated to ensure that the sampling interval reflects impacts caused by visitors as opposed to other natural causes.

Patch size in some meadows has been shown to be associated with reduced total vegetation, increased bare ground cover and an increased presence of non-native plants (Leung et al. 2011b). The value chosen to represent adverse effects reflects conditions found in individual meadows identified by park staff, managers, and subject matter experts as needing significant restoration actions. This value relates to low values for meadows within Yosemite Valley as well as Tuolumne Meadows, both of which have been identified for comprehensive ecological restoration. Through several years of data collection in Yosemite meadows, the value of 81% has been selected to reflect the condition of meadows that had extensive trailing networks, significant trampling impacts from trailing and areas of bare ground, and identified as needing extensive ecological restoration. These meadows should demonstrate accelerated recovery rates and good response to restoration once actions are taken. A conservative number has been chosen from existing data for increased sensitivity to impacts (NPS 2009).

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<sup>20</sup> As conditions are different across meadow types, which respond differently to varying levels of use, the management standard selected here for the Merced River corridor varies slightly from that selected to protect meadow values in the Tuolumne River Corridor, which is 90%. The fragmentation standards for the two plans demonstrate the range of acceptable values that are fully protective of the sensitive resources and that accommodate the inherent temporal variability in results from meadow fragmentation. In scaling this value up to the level of the segment, managers utilized best professional judgment in selecting a weighted mean that protects the river values at the segment level.

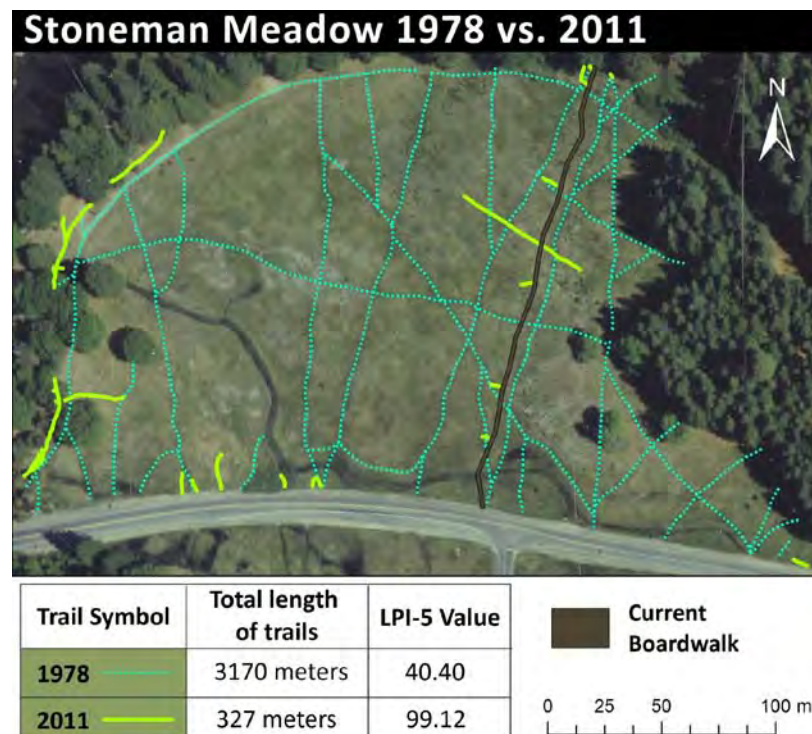
### Degradation Standard

Degradation would occur when fragmentation resulting from informal trailing results in a LPI<sub>5</sub> of 40%, as reflected as a weighted mean of all meadows recorded within a segment. This applies to montane and sub-alpine meadow complexes in the Merced River corridor.

Using archival aerial photographs, NPS staff members were able to simulate meadow degradation in certain Yosemite Valley meadows. Specifically, spatial analysis utilizing a 1978 image of Stoneman Meadow (Figure 5-1) revealed that an LPI<sub>5</sub> of 40% existed prior to intensive restoration efforts. The figure represents an example of a meadow in a degraded state. Although this meadow has shown evidence of recovery in

recent years, the recovery was a result of intensive restoration efforts, significant financial investment, and several years of planning. Past conditions in Stoneman Meadow represent meadow conditions that park managers and scientists feel best represent the level of degradation for meadows in Yosemite, including subalpine and alpine meadows. Current conditions in Stoneman meadow demonstrate the potential for recovery that is possible through intensive restoration efforts.

**FIGURE 5-1: INFORMAL TRAILS IN STONEMAN MEADOW IN 1978 AND 2011**



These 1978 informal trail values were determined based on the presence of trails in this aerial photograph from the Yosemite Archives. For LPI-5 values, all 1978 trails were given a default trail width of 12".

### Monitoring Meadow Fragmentation due to the Proliferation of Informal Trails

All meadows selected for monitoring will be evaluated for a complete set of measures reflecting extent, proliferation, and condition of trails and disturbed areas (Leung et al. 2011b). Monitoring of informal trails in meadows within the Merced River corridor would take place during the middle of the growing season before plant senescence. All meadows with a high potential for visitor-created impacts would be monitored on a three-year basis or at a maximum of five years. Meadows with specific management considerations would be monitored annually. Increased monitoring frequency may be triggered by actions listed in Table 5-8. Meadows of consideration are identified for increased monitoring based on other trends found in metrics collected alongside fragmentation data. Table 5-8 depicts measures that would trigger management response.

**TABLE 5-8: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR HIGH-ELEVATION MEADOWS (MEADOW FRAGMENTATION)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> Decrease in LPIs threshold below 93% at the level of an individual meadow.	<ul style="list-style-type: none"> <li>• Increase meadow monitoring assessments to one-year interval at each individual meadow that surpasses this value. Target the largest patches in meadow, and analyze trail condition and emergence of new trails.</li> <li>• Increase enforcement and education of best management practices in meadows.</li> <li>• Implement restoration practices, including visitor messaging, restoration signs after Wilderness Minimum Requirement Analysis, delineation of trails determined to be less disturbing to meadow ecology, and closure of informal trails.</li> </ul>	This action allows increased sensitivity to changes in trails, and would allow managers better opportunities to identify meadows of consideration, and take actions well before adverse effects are incurred. With more frequent assessment, emerging trails and particularly problematic trails would be identified and restoration actions taken.
<b>Trigger Point 2:</b> Data analyses from annual monitoring of fragmentation yields results less than an LPIs value of 93% for three consecutive years in an individual meadow or, a decrease below 90% at the level of an individual meadow.	<p>Further restoration of disturbed areas and informal trails in specific meadows that exceed trigger. Depending on the degree and extent of impacts, the NPS would enact some or all of the following actions:</p> <ul style="list-style-type: none"> <li>• Use boardwalks or hardened surfaces to allow access to sensitive areas.</li> <li>• Delineate trails through upland areas and along meadow perimeters to allow access while reducing fragmentation and meadow impacts.</li> <li>• Place restoration closure signs, and/or</li> <li>• Outside Wilderness, fence meadow perimeters. Within Wilderness, fence meadow perimeters if deemed appropriate after a Wilderness Minimum Requirement Analysis.</li> <li>• De-compact trampled soils.</li> <li>• Salvage plants growing in trail ruts and use as part of re-vegetation to consolidate multiple parallel trails.</li> <li>• Re-contour topography.</li> <li>• Scatter locally gathered seed and organic materials to facilitate new plant growth.</li> <li>• Fill deep headcuts caused by informal trails with native soil and re-contour to natural meadow topography.</li> <li>• Institute closures in individual impacted meadows, and increase visitor education associated with the closures</li> </ul>	This value represents the level at which a group of subject matter experts determined meadows to be threatening resource protection and quality of visitor experience.

### Indicator 3 – Streambank Stability for ORV 1

Impacts to streambank stability can result from many causes, including both anthropogenic and natural sources that alter sediment-discharge balance (Kondolf et al. 1996), and may be the result of cumulative impacts from both source types (Allen-Diaz et al. 1999). Examples of anthropogenic activities that contribute to destabilization of streambanks (hereafter, streambank alteration) include the following:

- Human foot-traffic (bank shear, compaction, vegetation trampling)
- Stock use (hoofpunching, bank shear, soil compaction, vegetation trampling, vegetation removal from grazing)
- Road/trail construction and/or informal trailing (soil compaction, decreased sheetflow, reduced infiltration/percolation, increased surface routing and flow velocities, vegetation composition changes)

Streambank stability is a long-term indicator of system function over time, and monitoring data on stability conditions can be used to verify the achievement of management objectives. Low ratings for streambank stability would be indicative of reduced system function and diminished biological integrity of riparian areas within the specified river segments.

Streambank stability ratings comprise a combination of habitat type, vegetative cover, and the presence (or absence) of erosion features (Frasier et al. 2005; Burton et al. 2011). Results of quality control tests conducted by Archer et al. (2004) demonstrated that streambank stability ratings had generally low coefficients of variation, were repeatable, and were consistent among different observers (especially for dichotomous ratings – either stable or unstable). Streambank stability has been widely identified as a factor affecting the geomorphic function of stream channels (Kondolf et al. 1996; Kattleman and Embury 1996; Madej et al. 1994; Kauffman et al. 1997).

Standards for streambank stability have been reported in published literature from various survey protocols, including the Pfankuch-Rosgen Channel Stability Assessment (Rosgen 2001), Stream Condition Inventory (Frazier et al. 2005), and Multiple Indicator Monitoring (Burton et al. 2011). Each protocol and corresponding optimal value for streambank stability ratings was considered in the determination of the trigger point, management target, adverse effect, and degradation standard for this ORV.

The following delineations for trigger point, management standard, adverse effects, and degradation standard are described hierarchically—in terms of increasing spatial and/or temporal scale from trigger point and management target, to adverse effects, and lastly to degradation standard. The trigger point and management target are determined at the monitoring site (or designated monitoring area) scale. Adverse effects and the degradation standard are determined at each river segment. In addition, the degradation standard incorporates temporal scale, where this standard is met if streambank stability conditions have not recovered to above the management standard over two monitoring intervals. This hierarchical distinction is consistent with the river discontinuum and continuum concepts, which infer that each river segment is comprised of individual components (Poole 2002) that collectively function as an interconnected riverine system (Vannote et al. 1980, Rosgen 1996).

### ***Management Standard***

The management standard for the maintenance of stable streambanks is 50% or greater for the mean observed value at any individual monitoring site.

Preliminary assessment of Multiple Indicator Monitoring data from sites categorically separated by use levels indicated a mean percentage of stable plots as 55% for the highest use sites without adjustment for statistical confidence ( $n = 3$ ; all located within the upper Lyell Fork of the Tuolumne River—a location similar to the high-elevation meadows in Merced Segment 1—and surveyed between 2009 and 2011). This value is consistent with the findings for nonreference (managed) sites by Frazier et al. (2005). Furthermore, this management target allows for a portion of streambank instability resulting from anthropogenic causes and/or dynamic processes (such as channel migration, erosion, deposition) fundamental to hydrologic function of fluvial river systems.

Despite a reportedly low coefficient of variation (Archer et al. 2004), an inherent level of uncertainty exists within our ability to quantifiably measure changes in streambank stability conditions, owing to variability in observers as well as variation within, and between, sites. Confidence limits developed from monitoring data would facilitate a given level of certainty (i.e., 95%, or 90%, confidence) for comparison of the mean of the



observed values and the management target (i.e., actions taken at the trigger point would occur before streambank stability reaches the management target, and are aimed facilitate the maintenance of streambank stability above the management target). Burton et al. (2011) reported the width of confidence intervals as 5.2% (at 95% confidence) from repeat surveys of streambank stability at 89 sites. Therefore, breach of the management target would be determined by comparing the management target to the value of the upper confidence limit for the mean of the observed data (i.e., the upper confidence limit is the observed value for streambank stability at a site plus the confidence interval value for these data).

### ***Adverse Effect***

Adverse impact for streambank stability is a rating significantly less than 50% stable for any one river segment (i.e., all monitoring areas within a river segment) for any single monitoring year, after restoration or use-restriction actions (as described under the Trigger Point section) have been implemented. Potential adverse effects may also be realized when a statistical trend is observed where streambank stability ratings significantly less than 50% stable are likely to occur in subsequent monitoring years without intervening management action.

As with the management target, the decline of streambank stability conditions below adverse effect would be determined by comparing the adverse effect to the value of the upper confidence limit for the mean of the observed data across the river segment.

### ***Degradation Standard***

Degradation would occur when rating values for all plots within a river segment are significantly less than 50% stable for two or more consecutive monitoring years after restoration or use-restriction actions (as described in the Trigger Point section) have been implemented.

Degradation of riparian zones and stream channels diminishes their capacity to provide critical functions, including chemical and nutrient cycling, water purification, flood attenuation, maintenance of stream flows and temperatures, groundwater recharge, and habitats for fish and wildlife (Kauffman et al. 1997).

Ultimately, adverse consequences of channel instability (or disequilibrium) would be associated with land productivity change, land loss, aquatic habitat deterioration, changes in both short- and long-term channel evolution, and loss of physical and biological function (Rosgen 2001). Extensive or severely degraded streambank stability conditions, manifested from either anthropogenic or natural sources, would likely propagate the loss of functional integrity of the stream channel on site and downstream. Realization of the degradation standard would be indicative of the need for substantial restoration investment.

### ***Monitoring Streambank Stability***

An initial condition assessment for streambank stability in this segment is complete, and precise monitoring in focal areas will begin in 2013. Baseline conditions for streambank stability would be established through data collection in 2013; subsequent evaluation of streambank stability conditions would be conducted on a three- to five-year monitoring interval thereafter.

The trigger point for streambank stability would be realized if streambank stability ratings for any monitoring site decline below stable ratings in more than 75% of the plots at a given monitoring site. The trigger point may also be realized when a statistical trend indicating the likelihood for a monitoring site to have less than 75% of plots rated as stable in subsequent monitoring years, without intervening management action, is observed.

Management actions taken at the trigger point would be pro-active actions to facilitate anti-degradation of river segment conditions below the management target. Streambank stability ratings greater than the management target are anticipated to retain some functional capacity. Functioning channels have an inherent resiliency for self-repair of some level of streambank alteration each year (Kauffman et al. 1997). Thus, management actions taken at the trigger point could be minimal in scope compared with efforts necessary for recovery from segment-wide adverse effects or degradation. Recovery would be achieved by restricting the level of use (i.e., access to riparian habitats) and promoting natural recovery processes (Kattelman and Embury 1996; Kauffman et al. 1997).

The trigger point is consistent with the reported findings for reference streams by Frazier et al. (2005). These authors reported the mean percentage of stable plots as 75.3 and 52.9, for 18 reference and 25 non-reference sites, respectively, from Stream Condition Inventory surveys in the Sierra. Standards for the optimal value of stability ratings have not been reported for the Multiple Indicator Monitoring protocol; however, this protocol has been applied at 20 sites in Yosemite National Park. Preliminary assessment of data for those sites – without separation by use type or magnitude – indicated the mean percentage of stable plots as 76%.

Per the trigger point, if less than 75% of plots at a given monitoring site are rated as stable, management action would be taken to evaluate the level of streambank alteration through more frequent (i.e., annual) and detailed assessments at that site. Annual assessments of alteration would provide data on the level, location, and distribution of use, and would facilitate inference on the degree to which use is affecting streambank stability. Concurrently, assessment of hydrologic conditions within the contributing source area for that monitoring site would be implemented to identify potential anomalies (i.e., excessive alteration at areas upstream of monitoring site, or the occurrence of natural events such as landslides or wildfires) as sources of site instability. In combination, these two management actions would help prioritize subsequent actions necessary for site recovery.

Management actions to facilitate site recovery would restrict use of riparian habitats by a combination of exclosures (access restriction), rest (temporary restriction of specific use types), and/or site restoration, depending on the specific impact. The duration of use restriction would depend on the rates of recovery of streambank stability and could be short- or long-term. Effectiveness monitoring would be initiated if management actions to restrict use levels are implemented. Table 5-9 depicts the triggers at which action would be taken to prevent system degradation.

**TABLE 5-9: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR HIGH-ELEVATION RIPARIAN HABITAT (STREAMBANK STABILITY)**

Trigger Point(s) at Which Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> The percentage of stable plots observed at any monitoring site declines to less than 75%, or a statistical trend indicating the likelihood for a monitoring site to have less than 75% stable plots in subsequent monitoring years, without intervening management action, is observed.	Conduct assessment of streambank alteration at impacted sites, and conduct hydrologic assessments of the contributing source area for that site. Implement actions to facilitate site recovery through restoration and/or use restriction (such as resource exclosure and site restoration). Implement use-restriction actions if streambank alteration or other anthropogenic activities are identified as causal mechanisms of instability. Increase monitoring frequency to evaluate effectiveness and recovery to the management target, and compare to reference site conditions as available.	The utility of this action would refine our understanding of baseline conditions and causal mechanisms (streambank alteration, natural processes, or cumulative effects) affecting streambank stability, on site and within the greater contributing source area for that monitoring site. Identification of land-use practices that are the most damaging to ecosystems or that prevent recovery is essential for restoration (National Research Council 1992). Comparison of site conditions to reference sites would validate observed conditions and recovery.

### ***Management Concerns and Protective Actions***

Using these three indicators, park managers will be able to assess when meadow conditions are declining or management concerns are present; management concerns occur when a trigger point for any one of the three indicators has been exceeded. In 2011, NPS staff conducted a meadow condition assessment using the bare soil indicator to characterize meadow and riparian conditions throughout the Merced River corridor and identify meaningful indicators and specific areas of concern (Ballenger et. al. 2011). This assessment suggests that from a segment-wide perspective, trigger points have not been reached in subalpine and alpine meadows, and adverse effects and degradation are not present in relation to bare soil.

The NPS is currently testing site-specific monitoring protocols for all three high-elevation meadow and riparian indicators. The NPS will establish a baseline for all three indicators using site-specific monitoring protocols by 2013. In relation to fragmentation and streambank stability indicators, the NPS is collecting initial data with the precise monitoring protocol during summer 2012, and baseline data will be available in 2013. After evaluating that baseline data according to the specific standards for the three meadow/riparian indicators, NPS will take management action if needed as prescribed in Table 5-9.

### ***Management Considerations and Enhancement Actions***

Several management considerations for this ORV concern Merced Lake-East Meadow, which NPS staff determined had a high level of bare soil, heavily grazed vegetation, and evidence of stock disturbance. There were also site-specific considerations present related to informal trails in meadows and to extirpated or declining meadow- and riparian-related wildlife species. To address these considerations, “Alternatives” (Chapter 8) considers the following actions:

- **Meadow trails:** Alternatives 2-6 would remove informal trails that incise meadow habitat, trails in wet and/or sensitive vegetation, and trails that fragment meadow habitat, including trails in the Triple Peak Fork meadow, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and other areas as necessary.
- **Merced Lake—East Meadow:** Alternatives 2 and 4 would prohibit administrative pack stock grazing at Merced Lake— East Meadow and require administrative stock users to pack in pellet feed. Under Alternative 3, 5, and 6, preliminary grazing capacities would be established, monitored, and adapted as necessary.
- **Re-introduce declining amphibian and reptile species:** In accordance with NPS Policy, Yosemite would continue to remove non-native species and reintroduce extirpated or declining species, as opportunities arise. The NPS would prioritize the study of the Western pond turtle and foothill yellow-legged frog. The NPS would also address issues related to fire management and non-native species control through actions prescribed in the *Yosemite National Park Fire Management Plan* (NPS 2004) and the *Invasive Plant Management Plan Update* (NPS 2010).

### ***Conclusion: Protecting and Enhancing Biological ORV 1 (high-elevation meadows and riparian habitat)***

The NPS is testing site-specific monitoring protocols for the three indicators in 2012: meadow bare soil, meadow fragmentation resulting from proliferation of informal trails, and streambank stability. The NPS will establish a baseline for all three indicators using site-specific monitoring protocols by 2013 and confirm the presence or absence of adverse effects, degradation, or management concerns in terms of identified standards. The NPS will also determine whether conditions have reached trigger points.

An initial meadow condition assessment (Ballenger 2011) suggested that grazing-related management considerations are present at one site, Merced Lake-East Meadow. Alternatives 3, 5, and 6 would discontinue grazing and allow the Merced Lake-East Meadow to recover until a secondary assessment method (e.g., California Rapid Assessment Method [CRAM, CWMW 2009]) indicates meadow recovery; Alternatives 2 and 4 would discontinue grazing in the meadow altogether and require pelletized feed to be packed in for all stock use. Once Merced Lake-East Meadow has recovered, Alternatives 2-6 consider a range of options to protect and enhance the meadow. Some alternatives would permanently close the meadow, requiring all pack stock passing through the Merced Lake area to carry pellet feed. Some alternatives would develop preliminary grazing capacities for the meadow, and allow administrative grazing at established capacities. Under Alternatives 2-6, the NPS would remove informal trails in wet meadows and those that fragment meadow habitat, and restore to natural meadow conditions under Alternatives 2-6. In accordance with NPS policy, the NPS would continue to remove non-native species and re-introduce extirpated or declining species as priorities and opportunities develop under Alternatives 2-6.

To ensure this ORV is protected and enhanced through time, the NPS will continue to monitor three indicators to assess the condition of the ORV: meadow bare soil, meadow fragmentation due to the proliferation of informal trails, and streambank stability. Monitoring these indicators, in association with the identified standard for the trigger points, would provide early warning of conditions that require management action before impacts occur. The indicators link to triggers that initiate a specific management response resume here.

## Biological ORV—Mid-elevation Meadows and Riparian Habitat

**ORV 2—The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada.**

**Location:** Segment 2 (Yosemite Valley)

**Rationale:** The large, moist mid-elevation meadows and the riparian vegetation communities of Yosemite Valley owe their existence to river processes that produce regular flooding and sustain high water tables, and past American-Indian burning and current prescribed burns that maintain open conditions for meadows. Yosemite Valley meadows and riparian habitats support rare and endemic species as well as an exemplary diversity of plant and animal species found in a variety of ecological niches.

**Management Objective:** The NPS would manage public use of meadows and riparian zones within the Merced River corridor to minimize habitat fragmentation, maintain high ecological condition, and protect the integrity of streambanks to conserve ecosystem processes associated with meadow hydrologic and ecological function.

### *ORV Condition at the Time of Designation (1987)*

An estimated 64% of the original meadow (and open forest) habitat in Yosemite Valley has converted to dense forest since the mid-1800s (Ballenger et al. 2011). Scientists hypothesize that this rapid conversion to dense forest had several origins, including suppression of regular burning conducted by California Indians, impacts to natural hydrologic flows, and agricultural practices that disturbed land and created conditions favorable for conifer germination (Cooper 2008). While most meadow loss occurred prior to the 1940s (NPS 1997 Parkwide Vegetation Map; NPS 1937 Type Mapping, Hoffman 1866), infrastructure and development continue to influence the hydrologic regime, reducing the distribution and extent of connected floodplain, level and extent of meadow inundation, and the meadow extent. For example, roads can alter hydrologic flows that sustain meadows, particularly when culverts are too small to accommodate water flow.

California Indians conducted small, low-intensity surface fires for centuries to increase growth and yield of crops, aid in hunting and insect collection, and perform other functions (Gassoway 2007). Systematic burning was likely a component in maintaining the open park-like scenery described by early visitors and explorers (Greene 1987). Since Anglo-American contact in the mid-1800s, park managers steadily eliminated meadow burns conducted in Yosemite Valley by Indians (Gassoway 2007; Anderson 2005).

Anthropogenic impacts to hydrologic flows in Yosemite Valley were both purposeful and inadvertent. For example, in 1879 Galen Clark, Guardian of the Yosemite Grant, used blasting methods to lower the level of the terminal moraine located just downstream of El Capitan Meadow in an effort to drain upstream meadows and enhance access to east Yosemite Valley (Milestone 1978). Most Merced River tributaries in Yosemite Valley were also channelized in part (Milestone 1978), altering the path of water that would naturally flow from cliff walls in a sheet or braided fashion across the meadows.

Historic impacts on riparian communities were also widespread. Madej (1994) reviewed historic photographs and documents related to the Merced River channel and found “banks were well vegetated, except on the outside of meander bends or where humans had already concentrated their activities. Riparian vegetation was typically dense and vigorous.” By the late 1970s, there were over 4,000 meters of riprap revetment placed along the banks of Yosemite Valley streams (Milestone 1978; ENTRIX 2012). Madej (1994) documented severe riverbank erosion in specific areas, particularly in sites in proximity to development. There was a strong relationship to accelerated erosion and a lack of riparian vegetation. Based on earlier studies, these impacts remained at the time of designation in 1987.

Through time, many park managers took action to control conifer encroachment in meadows. Galen Clark initiated the first post-contact conifer thinning in Yosemite Valley in the early 1890s (Clark 1894). Conifer clearing continued in the campgrounds and in El Capitan Meadow in 1919 (Greene 1987). Emil Ernst, Yosemite Park Ranger/Forester in the 1930-1950s, championed and conducted large efforts to control conifer encroachment. Efforts to control conifer encroachment with prescribed burning began in 1970.

By the time of designation, the NPS had several fundamental programs and projects in place to address the vegetation changes in Yosemite Valley and to improve the integrity of remaining meadows. Notably, the NPS systematically reintroduced fire into Yosemite Valley meadows. Park staff and volunteers also removed tens of thousands of conifer seedlings and saplings from Yosemite Valley meadows since the time of designation (Ballenger et al. 2011). These practices kept encroaching conifers at bay in many Yosemite Valley meadows. These actions were intended to restore the open scenery and cultural landscape that was changed by the cessation of American Indian burning beginning about 1850, and counter human-initiated changes in hydrologic processes and topography that channelized sheet flow in meadows.

In 1987, riparian areas along the banks of the Merced River in Yosemite Valley demonstrated substantial impacts including erosion, denuded riparian vegetation, and poorly designed riprap revetment (Tucker 1996; Cardno ENTRIX 2012). Madej et al. (1991) found a strong association among levels of human use around campsites and river access points, and loss of riparian cover leading to accelerated bank erosion. Trampled soils with denuded vegetation in the developed, high-use areas of east Yosemite Valley (e.g. Upper Pines, Lower Pines, and North Pines Campgrounds) exposed highly erodible soils on the riverbanks that were vulnerable to accelerated erosion. This condition contributed to substantial widening of the river in some reaches (Madej et al 1991). The potential effects of denuded riparian vegetation on the riverbanks include lack of shading and altered nutrient dynamics in aquatic habitats, reduced riparian habitat for wildlife, increased water temperature, increased suspended sediment, and reduced dissolved oxygen levels (Madej et al. 1994). Other areas in west Yosemite Valley exhibited extensive trampling from visitor use and a

subsequent decrease in riparian vegetation including the former El Capitan Picnic Area, the Lower River Campground/Housekeeping Camp area, Devil's Elbow, and North Pines Campground.

### *Current ORV Condition*

The NPS conducted a number of projects to enhance the condition of meadow and riparian areas in Yosemite Valley since the time of designation. These projects include:

- Extensive removal of high priority non-native species in meadows and riparian areas
- Boardwalks installed in Sentinel and Stoneman Meadows, substantially reducing the dense network of informal trails in these meadows
- Fill removed in Sentinel Meadow from the site of a former movie house and dance hall (Pavilion Square), and natural meadow topography restored at the site
- Comprehensive ecological restoration in Cooks Meadow involving removal of a historic road (abandoned), filling in ditches, and restoration of natural meadow topography; and construction of a boardwalk across sensitive meadow habitat
- Comprehensive riparian habitat restoration at Lower River Campground, Housekeeping Camp, El Capitan Picnic Area, Devil's Elbow, Sentinel Bridge, Swinging Bridge, Clark's Bridge, North Pines Campground, and the Cascades Dam site, after dam removal
- Removal of infrastructure from meadows and riparian habitat including actions to remove buried utility lines in meadows and replace them under existing roadways, removal of underground utility lines that cross the Merced River, and removal of utility lines and lift stations from riparian/riverbank areas

These projects mitigated many meadow- and riparian- related issues, though many remain. The *Baseline Conditions Report* (NPS 2012) reached the following conclusions as regards the current conditions of Yosemite Valley meadows and riparian areas:

- **Informal trails:** Informal trails are visitor-created noticeable tracks that are not managed directly by park staff, as opposed to maintained, formal trails. Informal trails are common in Yosemite Valley meadows. Meadow research demonstrates that impacts associated with trails can extend beyond direct trail impacts, with impacts radiating from the trail's edge into the meadow (Holmquist 2004).
- **Conifer encroachment:** In five of six meadows surveyed, tree seedlings were present in more than 10% of the study plots, indicating that the tree encroachment documented since 1870 (Gibbens and Heady 1964) continues. The extent of tree seedlings was highest in El Capitan and Stoneman Meadows (32% of plots contained seedlings), indicating that nearly one-third of meadow area in El Capitan Meadow and Stoneman Meadow has some degree of tree encroachment (Ballenger et al. 2011).
- **Non-native species:** Non-native species are common across all Yosemite Valley meadows, with the highest extent of non-natives found in El Capitan Meadow and Stoneman Meadow (as inferred from percent of plots with non-native plants present—92-96% of plots contained non-native species) (Ballenger et al. 2011).
- **Meadow vegetation composition:** The mean cover of non-native plants was lower in saturated and inundated soils (by a factor of two to seven) compared with moist to dry soils (Ballenger et al. 2011). As found in other studies (Dwire et al. 2006), the distribution of non-native plants was strongly linked to water table depths in meadows, with a higher presence of non-native species in drier areas. Maintaining meadow water tables to promote areas of wet soil may be a means to sustaining native meadow vegetation composition (Kluse and Allen-Diaz 2005).

- **Meadow topography:** Ditches and other human alterations to meadow topography, remnants of the past agricultural era, remain within Yosemite Valley meadows. Ditches were also constructed during NPS administration beginning in 1929, often referred to as “moral ditches” to keep people from driving into meadows. (Greene 1987). Ditches increase drainage and lower natural water-table levels, favoring non-native meadow vegetation.
- **Sensitive meadow habitat:** Formal trails in the Ahwahnee Meadow, Bridalveil Meadow, and Slaughterhouse Meadow pass through sensitive meadow habitat, some of which is inundated on a regular basis. Trails can alter hydrologic connectivity within the meadow by blocking natural flows.

A recent assessment of riparian vegetation took place in 2010 (Cardno ENTRIX 2012). The *Merced River and Riparian Vegetation Assessment* utilized the California Rapid Assessment Method (CRAM) to assess the condition of eight different reaches of the Merced River in Yosemite Valley. The study found:

- Reaches with high scores (Happy Isles, inter-meadows, and above Pohono Bridge) had lower intensities of visitor use, and were generally characterized as areas with little riprap revetment, less bank erosion, high topographic complexity, and moderately developed vegetation with moderate structural complexity.
- Areas with poor scores (above and below the confluence with Tenaya Creek, and below Pohono Bridge) had higher intensities of visitor use, more riprap, more bank erosion, low topographic complexity, and a poorly developed riparian community.
- Recreational use and infrastructure affected the condition of riparian wildlife habitat. Conditions varied by reach in response to the type of human impact. For example, the reach below Happy Isles was characterized as good wildlife habitat, with wide riparian buffers and a complex physical structure. Conversely, the reach below the confluence with Tenaya Creek was characterized as poor wildlife habitat, with narrow riparian buffers and low vegetation structural complexity.
- The majority of the riparian corridor had few non-native species, and moderate horizontal zonation and vertical overlap among plant layers, indicating a well-developed riparian community.
- The study observed bank erosion throughout the study area, particularly near bridges, recreation facilities, and some meander bends. Areas with moderate to high human use generally had fewer co-dominant species and lower riparian community structure complexity.

The *Wildlife Condition Assessment for the Merced River Corridor in Yosemite Valley* (Espinoza et al. 2011) assessed the health of riparian and meadow habitats in Yosemite Valley in relation to focal bird species. The study suggests that there is greater availability of riparian habitat in the Upper Meadow, Inter-meadow, and Lower Meadow reaches, and that the structural integrity of the riparian habitat in these reaches may be higher than in other areas of the Sierra Nevada.

## ***Management Program for ORV 2***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. The NPS selected three distinct indicators to monitor the condition of this ORV through time: 1) fragmentation of meadow habitats resulting from proliferation of informal trails, 2) status of riparian habitat, and 3) riparian bird abundance.

### **Indicator 1 – Meadow fragmentation due to proliferation of informal trails for ORV 2**

The NPS would employ the same fragmentation indicator used for ORV 1 in high elevation habitats to monitor meadows in Yosemite Valley, the Largest Patches Index – Five (LPI<sub>5</sub>). The NPS would utilize the

same protocols and definitions of adverse effect and degradation as described under ORV 1—high-elevation meadows and riparian habitat—Indicator 1, described earlier in this chapter. The management responses will vary slightly due to differences in access and limitations on structures in Wilderness. The trigger points and management responses for this indicator in Segment 2 are found in Table 5-10.

**TABLE 5-10: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR MID-ELEVATION MEADOWS (MEADOW FRAGMENTATION)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> Decrease in LPIs threshold below 93% at the level of an individual meadow.	<ul style="list-style-type: none"> <li>• Increase meadow monitoring assessments to one-year interval at each individual meadow that surpasses this value. Target the largest patches in meadow, and analyze trail condition and emergence of new trails. Additional potential management actions include:</li> <li>• Increase enforcement and education of Best Management Practices in meadows.</li> <li>• Implement restoration practices, including visitor messaging, restoration signs if appropriate after Wilderness Minimum Requirement Analysis, delineation of trails determined to be less disturbing to meadow ecology, and closure of selected informal trails.</li> </ul>	This action allows increased sensitivity to changes in trails, and would allow managers better opportunities to identify meadows of consideration, and take actions well before adverse effects are incurred. With more frequent assessment, emerging trails and particularly problematic trails would be identified and restoration actions taken.
<b>Trigger Point 2:</b> Data analyses from annual monitoring of fragmentation yields results less than anLPIs value of 93% for three consecutive years in an individual meadow or a decrease below 90% at the level of an individual meadow.	Further restoration of disturbed areas and informal trails in specific meadows that exceed trigger. Depending on the degree and extent of impacts, the NPS would enact some or all of the following actions: <ul style="list-style-type: none"> <li>• Use boardwalks or hardened surfaces to allow access to sensitive areas,</li> <li>• Delineate trails through upland areas and along meadow perimeters to allow access while reducing fragmentation and meadow impacts</li> <li>• Place restoration closure signs, and/or</li> <li>• Fencing along meadow perimeters</li> <li>• De-compact trampled soils.</li> <li>• Salvage plants growing in trail ruts and use as part of revegetation to consolidate multiple parallel trails.</li> <li>• Re-contour topography.</li> <li>• Scatter locally gathered seed and organic materials to facilitate new plant growth.</li> <li>• Fill deep headcuts caused by informal trails with native soil and re-contour to natural meadow topography.</li> <li>• Institute closures in individual impacted meadows and increase visitor education associated with the closures</li> </ul>	This value represents the level at which a group of subject matter experts determined meadows to be threatening resource protection and quality of visitor experience.

## Indicator 2 – Status of Riparian Habitat for ORV 2

The objective of this indicator is to provide a comprehensive rapid assessment of riverbank (river riparian habitat) status every two to three years. The intent is to detect potential impacts from visitor use at the incipient stage and correct them in a timely manner so as to protect and enhance biological and geologic/hydrologic ORVs. Given the spatial and temporal complexity of riparian systems, this general indicator would be part of a comprehensive river protection implementation program that includes permanent riverbank vegetation monitoring plots and river cross-section analysis in addition to periodic



surveys for total accumulated large wood in the channel. The NPS will also use this indicator to monitor a component of ORV 10, ethnographic resources in Yosemite Valley.

The park would adopt the California Rapid Assessment Method (CRAM) (Collins et al. 2008) for producing condition ratings along approximately 10 miles of alluvial river channel in Yosemite Valley (Happy Isles Bridge to 0.6 mile downstream of Pohono Bridge). This extensively peer-reviewed and validated protocol (e.g., Stein et al. 2009) is intended to provide a general condition index of riparian and wetlands sites using a combination of landscape, hydrology, physical, and biotic structure scores. Both banks of the river would be evaluated in 200-meter reaches (approximately 160 individual sites) every two to three years. Scores range from 0.27 for the poorest condition up to 1.00 for the best. In Yosemite Valley, 20% of sites as evaluated in 2010 were classified in the low-condition class (scores below 0.71) and 20% were classified in the high-condition class (above 0.87) (Cardno ENTRIX 2012).

Necessarily broad in nature, the condition rating integrates substantial information and has been shown to adequately distinguish poor and good site conditions, while allowing for documentation of stressors that may be affecting ecosystem processes. The latter is particularly important for a rapid survey in this setting as it permits a fairly direct connection to possible management actions necessary to protect and enhance the ORV. This indicator would be supported by more rigorous monitoring of riparian vegetation and riverbank condition at permanently established plots in this segment (Yosemite National Park 2010). The park may adopt other protocols<sup>21</sup> to address this indicator that provide more refined metrics of riparian condition as they become available.

### ***Management Standard***

The management standard for the status of riparian habitat varies across the alternatives described in “Alternatives” (Chapter 8). Table 5-11 demonstrates the appropriate standard to each alternative. The standard is derived from an assessment of the number of sites currently in a low condition class (Cardno ENTRIX 2012) that will be affected by actions in each alternative of the plan. Of the 20% of sites currently in the low condition rating, approximately half have the potential of being restored to a moderate or high condition class in Alternatives 2 and 3. The remaining 50% of these sites could remain in a low condition class due to their proximity to critical roads and bridges. Therefore, a maximum of approximately 90% of all sites could achieve a moderate- or high-condition rating once restoration actions are taken in Alternatives 2 and 3. Moreover, to ensure that at least a portion of sites are in high condition, a minimum of 20% of sites shall be in high-condition class.

Increased visitor use coupled with placement of additional campgrounds near the river in Alternatives 4, 5, and 6 reduce restoration potential. Substantial restoration actions would be mostly offset by the potential for increased riverbank impacts due to visitor access and proximity to the river. With substantial controls in place such as fencing, designated river access points, and routine monitoring, there is the potential for modest improvements in site condition, though it is difficult to estimate this. For this reason, the management standards reflect the current distribution of sites in high, medium, and low condition classes. Setting management standards to the experiences envisioned in an alternative, as proposed herein, is a practice recommended by noted user capacity experts.<sup>22</sup>

<sup>21</sup> Note that the streambank stability indicator used to monitor higher elevation meadows (both in this plan and in the Tuolumne River Plan/DEIS) is not suitable for the higher order stream found in Yosemite Valley; CRAM is.

<sup>22</sup> Specifically, by Dave Cole, Bo Shelby, and Doug Whittaker. Wilderness recreation management standards also vary by alternative, both in this plan and in the Tuolumne River Plan/DEIS.

**TABLE 5-11: MANAGEMENT STANDARDS FOR THE STATUS OF RIPARIAN HABITAT INDICATOR**

<b>Alternatives</b>	<b>Associated Management Standard</b>
Alternative 1	No action
Alternative 2	At least 90% of sites would attain CRAM scores of 0.7 or higher (moderate or high rating) and at least 20% of sites would rate as high condition (greater than 0.87) during any single monitoring period. <sup>23</sup>
Alternative 3	At least 90% of sites would attain CRAM scores of 0.7 or higher (moderate or high rating) and at least 20% of sites would rate as high condition (greater than 0.87) during any single monitoring period.
Alternative 4	At least 80% of sites would attain CRAM scores of 0.7 or higher (moderate or high rating) and at least 20% of sites would rate as high condition (greater than 0.87) during any single monitoring period.
Alternative 5	At least 80% of sites would attain CRAM scores of 0.7 or higher (moderate or high rating) and at least 20% of sites would rate as high condition (greater than 0.87) during any single monitoring period.
Alternative 6	At least 80% of sites would attain CRAM scores of 0.7 or higher (moderate or high rating) and at least 20% of sites would rate as high condition (greater than 0.87) during any single monitoring period.

### *Adverse Effect*

An adverse effect is indicated when thirty percent or more of the river segment is rated in a low condition class, as measured by the CRAM rating system. This is the minimum change below current condition that could be detected given physical metrics and observer variability.

Surveys in 2010 (Cardno ENTRIX 2011) indicated that about 20% of the riparian area along the Merced River in Yosemite Valley was in low condition. Consensus among NPS staff and outside specialists is that this is an unacceptable impact on riparian habitat. However, these impacts are highly localized (almost all of them are between Clark's and Sentinel Bridge), with the remaining 80% of the segment in higher condition (moderate or high). Most riparian habitat in the valley, in other words, is functioning at an acceptable level. Consequently, the segment as a whole is functioning at a level higher than what most ecologists would consider adverse effect (e.g., Poole 2002). Management concerns are clearly present (see below), with the overall river condition approaching adverse effect. This definition of adverse effect, then, defines a point that is the minimum detectable decline in proportion to monitoring sites in the moderate and high condition classes from the 2010 survey.

Currently, 16 of 81 sites (20%) rate in low condition. In order to detect a significant increase (at the 95% confidence level) in the number of sites in low condition, at least 22 sites (27%) would have to fall into the low category. Given the dynamic nature of river systems and the estimated uncertainty in CRAM scores of +/- 6% (Stein et al., 2009), the percentage of sites in the low condition class that constitutes adverse effect is rounded to 30%.

### *Degradation Standard*

Degradation is indicated when 50% or more of sites have CRAM condition ratings of less than 0.71.<sup>24</sup>

<sup>23</sup> The 0.7 and 0.87 values are based on the grouping of such scores in Cardno ENTRIX 2012.

<sup>24</sup> This value is taken directly from Cardno ENTRIX 2012, in which this value delimited the lowest fifth of CRAM scores from the other 80%--those values that were considered "low" in condition.

Extensive or severely degraded streambank stability conditions, manifested from either anthropogenic or natural sources, would likely propagate the loss of functional integrity of the stream channel on site and downstream. Degradation of riparian zones and stream channels diminishes their capacity to provide critical functions, including chemical and nutrient cycling, water purification, flood attenuation, maintenance of stream flows and temperatures, groundwater recharge, and habitats for fish and wildlife (Kauffman et al. 1997). Ultimately, adverse consequences of channel instability (or disequilibrium) would be associated with land productivity change, land loss, aquatic habitat deterioration, changes in both short- and long-term channel evolution, and loss of physical and biological function (Rosgen 2001). Realization of the degradation standard would be indicative of the need for substantial restoration investment.

### ***Monitoring Program for the Status of Riparian Habitat***

Monitoring would take place along the entire portion of this segment that is alluvial in nature. This encompasses the stretch of river between Happy Isles Bridge and 0.6 mile downstream of Pohono Bridge. Both left and right banks of the river over this entire length would be divided into 200-meter sites (reaches) and each would be assigned a CRAM score. Monitoring would be conducted every two to three years and after major (greater than 10-year return interval) flood events. Table 5-12 depicts the trigger points and management response to riparian habitat ratings.

**TABLE 5-12: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR MID-ELEVATION RIPARIAN HABITAT (STATUS OF RIPARIAN HABITAT)**

Trigger Point(s) at Which Action Management Would Be Taken	Possible Management Actions	Rationale for Management Actions
<p><b>Trigger Point 1:</b> Routine survey finds the decline of condition class of any reach from high to moderate, high to low, or moderate to low. Alternatively, the surveyors note any localized impact due to visitor use such as an incipient headcut or loss of riverbank vegetation. The scale of impacts and potential restoration is up to 200 meters of riverbank, the maximum single reach length in the CRAM protocol.</p>	<p>Investigation of site conditions and potential factors leading to the decline in condition class or localized impact. Specific mitigating actions could range from continued regular monitoring to restoration and exclusion of the reach from visitor use. Actions could include:</p> <ul style="list-style-type: none"> <li>• Restore affected area and address causes of impacts</li> <li>• Fencing around campgrounds and designated river access points</li> <li>• Increased monitoring frequency to assure recovery of site</li> </ul>	<p>The purpose of this trigger is to allow for immediate site-specific action regarding a potential impact to riparian condition. In addition, this action will refine our understanding of baseline conditions and causal mechanisms (streambank alteration, natural processes, or cumulative effects) affecting streambank condition, on-site and within the greater contributing source area for that site.</p>
<p><b>Trigger Point 2:</b> Presence of a negative trend indicating that the breach of the management standard is likely without intervening management actions. The scale of impacts here is greater than 200 meters of riverbank. <i>(Note that this is considered the current state of the riparian area in the Yosemite Valley segment.)</i></p>	<p>Action at this level requires a more comprehensive visitor management and restoration response than under Trigger Point 1. Actions at this point must be sufficient to restore river condition at greater than the single reach scale and prevent (or mitigate) displacement of impacts upstream or downstream of the affected area. Actions include:</p> <ul style="list-style-type: none"> <li>• Fencing around campgrounds and designated river access points</li> <li>• Active patrols of river area to protect riparian vegetation from trampling</li> <li>• Manage access by limiting use adjacent to the river</li> <li>• Close or re-design campgrounds to lessen human impacts to the riparian area</li> </ul>	<p>This trigger point indicates that impacts have grown beyond site-specific impacts and now affect multiple reaches of the river. While unforeseen circumstances could manifest this condition, visitor impacts are likely to be the most important factor. The purpose of taking action at this point would be to prevent impacts from coalescing and propagating downstream leading to adverse effect.</p>

**TABLE 5-12: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR MID-ELEVATION RIPARIAN HABITAT (STATUS OF RIPARIAN HABITAT)**

Trigger Point(s) at Which Action Management Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 3:</b> The condition of the riparian has not improved 10 years after reaching Trigger Point 2 and implementation of major restoration and visitor use management actions.	Reduce use.	Riparian condition may take several years to recover following restoration or visitor use management actions. No measureable improvement 10 years after implementing actions, however, most likely indicates human use is preventing recovery.

The NPS would evaluate the effectiveness of the indicators regularly to assure that the combination of these metrics fully protect the ORV.

### Indicator 3 – Riparian Bird Abundance for ORV 2

The riparian bird indicator is based on the relative abundance of five riparian bird species that breed throughout the meadow and riparian habitats in the Yosemite Valley segment each summer. Birds are an effective indicator of overall habitat quality and have been used as indicators of ecological integrity in a variety of habitats (Bradford et al. 1998; O’Connell et al. 2000; Canterbury et al. 2000; Venier and Pearce 2007). Bird monitoring is cost-effective, efficient, and effective because birds advertise their presence through vocalizations, making them relatively easy to detect and identify; also, they can be censused efficiently over various spatial scales. An assemblage of birds with strong ecological ties to riparian habitat, as opposed to a single species, incorporates a wider range of sensitivities to habitat disturbances and modifications (Koskimies 1989). Hence, relative abundance of such an assemblage would be more likely to reflect changes in the ecosystem. Furthermore, consistent causes of change should be easier to identify, and local natural changes in population dynamics of one of the species should be less likely to skew overall data (Zonneveld 1983).<sup>25</sup>

The riparian bird indicator comprises five focal species identified by the Riparian Habitat Joint Venture as being biologically relevant indicator species (RHJV 2004) occurring in Yosemite Valley in abundances that allow collection of an adequate sample size. These five species are spotted sandpiper, warbling vireo, yellow warbler, song sparrow, and black-headed grosbeak (see Table 5-13 for scientific names and associated characteristics). This suite of focal species follows suggestions by Chase and Geupel (2005) to select species that are easy and efficient to monitor and that represent various habitat elements and processes in the riparian ecosystem. All of the selected focal species except for Song Sparrow are neotropical migrants, which are considered sensitive, and declines in neotropical species owing to human disturbance and habitat fragmentation have been well documented (Temple 1986; Terborgh 1989; Wilcove and Terborgh 1984). This indicator includes ways of detecting impacts on the bird populations caused by factors occurring outside of Yosemite Valley or even Yosemite; see below).

<sup>25</sup> Additionally, riparian bird abundance is a better indicator for Yosemite Valley meadows than bare soil because bare soil as an indicator is most appropriate for areas where grazing occurs (there is no grazing in YV), while riparian bird abundance is a direct measure of habitat quality (because the birds chosen for this alternative are directly dependent on such habitat).

**TABLE 5-13: RIPARIAN BIRD ASSEMBLAGE IN YOSEMITE VALLEY SEGMENT AND GUILD ASSIGNMENTS**

Species	4-Letter code <sup>a</sup>	Scientific name	Neotropical migrant <sup>b</sup>	Nest type <sup>c</sup>	Diet <sup>d</sup>	Foraging type <sup>e</sup>
Spotted sandpiper	SPSA	<i>Actitis macularius</i>	Y	GRND	IN	GG
Warbling vireo	WAVI	<i>Vireo gilvus</i>	Y	HICUP	IN	FG
Yellow warbler	YEWA	<i>Setophaga petechia</i>	Y	LOCUP	IN	FG
Song sparrow	SOSP	<i>Melospiza melodia</i>	N	GRND	OM	GG
Black-headed grosbeak	BHGR	<i>Pheucticus melanocephalus</i>	Y	LOCUP	OM	FG
NOTE: Data compiled by Bryce 2006 and collected from Terres 1980, Ehrlich et al. 1988, and DeGraaf et al. 1991. <sup>a</sup> The American Ornithologists' Union 4-letter codes (AOU 2011); provided here for ease in finding them in this source. <sup>b</sup> Neotropical migrant: N = no; Y = yes <sup>c</sup> Nest type: GRND = ground nester; LOCUP = cup nest generally 10 feet or less off the ground; HICUP = cup nest generally >10 feet off the ground <sup>d</sup> Diet: IN = insectivore; OM = omnivore <sup>e</sup> Foraging type: FG = foliage gleaner; GG = ground gleaner						

These focal species' requirements define different spatial attributes, habitat characteristics, and management practices that are representative of a healthy riparian system (Chase and Geupel 2005). By using riparian vegetation as their primary breeding habitat in Yosemite and needing the full range of riparian successional stages for successful breeding, these specialists represent better indicators than habitat generalists (who are also less susceptible to local extinction following environmental change) (Hutto 1998). Population trends of these riparian habitat specialists could indicate whether the integrity of the habitat is improving or deteriorating under the range of possible habitat management regimes (Carignan and Villard 2002).

Although birds have been widely used as indicators (Beintema 1983; Powell and Powell 1986; Bost and Mayo 1993; Daily et al. 1993; Bradford et al. 1998; Hutto 1998), it is still challenging to develop an indicator that discriminates between population declines caused by changes within the local habitat (i.e. the Yosemite Valley meadows and riparian habitat—ORV 2) and declines caused by factors occurring outside of that habitat (i.e. changes in the wintering habitat of such birds in Central America, disease, parasites, competition, predation, conditions in other areas used by migratory species, and/or climate change). This monitoring program would address this need in two complementary ways (Steele et al. 1984; Bryce 2006).

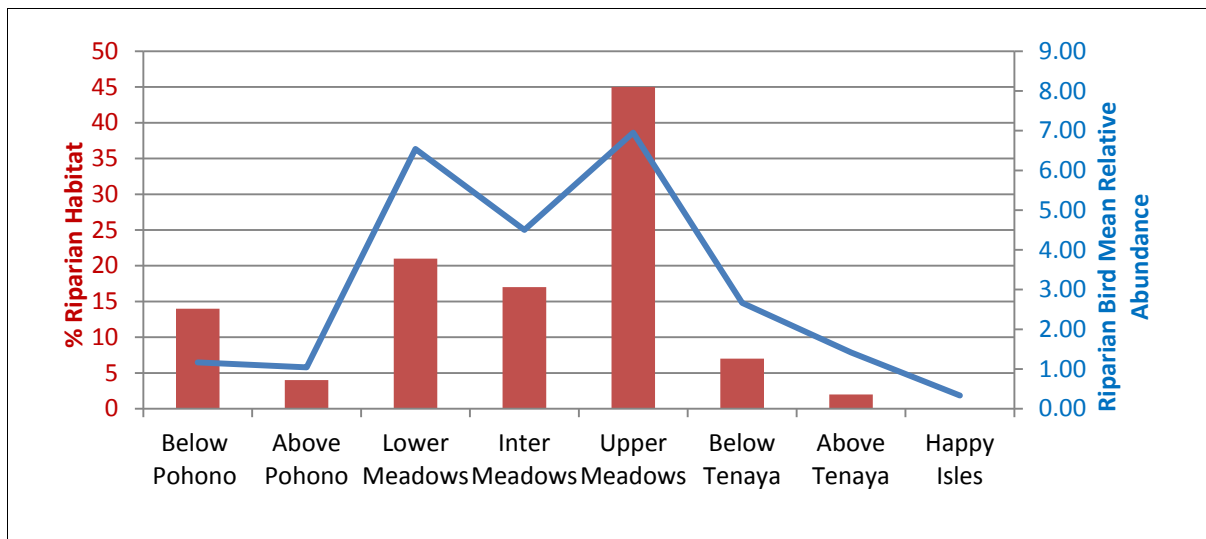
First, the NPS would continue conducting parkwide surveys for these birds done as part of the Sierra Nevada Network bird-monitoring program (and using the peer-reviewed survey protocol developed by Siegel et al. 2010). This annual data collected park-wide would provide an invaluable comparison with population trends detected in Yosemite Valley. For example, if yellow warblers disappear from Yosemite Valley, park ornithologists could turn to the park-wide dataset (collected using exactly the same protocol) to determine if the trend is local or if instead it indicates a more widespread threat.

Second, the NPS would conduct these bird surveys at the same sites (randomly selected) where the Yosemite Visitor Use and Impact Monitoring Program also collects vegetation, riverbank, and human use data (Newburger et al. 2009; Starcevich 2011).<sup>26</sup> If there is a perceived decline in riparian bird abundances,

<sup>26</sup> Vegetation data collected include functional groups related to understory community composition (nonvascular plants, annual biennials, tap-rooted perennials, fibrous-rooted perennials, woody seedlings, and shrubs), physical riverbank characteristics (litter cover, bare ground, large woody debris, substrate size classes, and exposed roots), and canopy characteristics (deciduous trees, evergreen trees, and snags).

then the vegetation data could be used to determine possible effects from any changes that have occurred in vegetation attributes. Several studies have found local vegetation and habitat characteristics to be important in explaining variation in local bird abundance (e.g., Wiens and Rotenberry 1981; Cody 1985; Strong and Bock 1990; Saab 1999; Nur et al. 2008). Such knowledge of a species' life history and habitat requirements enables researchers to relate an observed decline to possible human impacts on specific habitat components or to a flood or other natural event. For example, preliminary data suggest a relationship between the relative abundance of riparian birds in Yosemite Valley and the amount of riparian habitat within specific reaches of the Merced River (Cardno ENTRIX 2012) (Figure 5-2). If a decline in one of the species using these riparian habitat types were detected, park managers would examine those habitats to see if changes were occurring that could account for the decline; they would examine the area's recent history to see if a natural event could have caused the decline.

**FIGURE 5-2: MEAN RELATIVE ABUNDANCE OF FIVE RIPARIAN FOCAL SPECIES IN 2010-2011 IN RELATION TO PERCENTAGE OF RIPARIAN HABITAT (CARDNO ENTRIX 2012)**



NOTE: Graph portrays Black Cottonwood Temporarily Flooded Forest Alliance and Shining Willow Riparian Scrub in Eight Discrete Geomorphic Reaches in Yosemite Valley

As explained in more detail below, bird surveys would be conducted at 24 randomly selected sites each year during the breeding season (May 15-June 30), with three sets of bird surveys performed at each of the 24 plots. Birds would be tallied both by sight and sound; if observers see or hear a bird, the bird's presence would be noted.

In summary, the riparian bird indicator is based on five riparian specialist bird species that commonly breed in Yosemite Valley's riparian habitat and that represent various life histories and riparian habitat requirements (Table 5-13). The indicator accounts for population changes that could be caused by sources external to the habitat condition of this ORV by including two additional components: (1) comparison with similar data being collected on a wider spatial scale, and (2) matching the sampling plots with concurrent data collection on vegetation attributes and extent of human use. Over the long term, such relative abundance data on riparian-obligate species will be used to assess whether meadow and riparian communities in Yosemite Valley are achieving the management standard.

### Management Standard

The management standard is that the abundance of any one of the five species, averaged across the three annual observation periods, exceeds the 25<sup>th</sup> percentile of its distribution in at least three out of every ten years, or that the average abundance of all five species, averaged again across the three annual observation periods, exceeds their summed 25<sup>th</sup> percentile, unless a species shows similar declines in other nearby riparian habitat not in Yosemite Valley. For example, for song sparrow populations to meet the management standard, observers would need to see or hear at least four individuals in their three visits to exceed the 25<sup>th</sup> percentile (4 sightings/3 visits=1.33 birds per visit, which exceeds the 25<sup>th</sup> percentile value of 1.22), at least three times in a decade. Or, for the sum of all five species, observers would need to see or hear an average of ten or more of any of the five species (any combination that adds to ten) on each of their three annual visits, to exceed the 25<sup>th</sup> percentile (10 sightings/3 visits=3.33, which exceeds the 25<sup>th</sup> percentile value of 3.21), again at least three times in a decade.

The riparian bird management standard adopted for the *Merced River Plan/DEIS* was developed from a four-year pilot dataset: a two-year dataset collected by NPS biologists in 2010-2011 at 24 randomly selected monitoring plots (NPS unpublished data) and a two-year dataset collected by other skilled bird observers (Point Reyes Bird Observatory scientists) in 2006-2007 at 20 systematically placed plots in Yosemite (Stillwater Sciences 2008). In the absence of long-running historical data in Yosemite Valley, this standard uses the 4-year pilot dataset to determine expected interannual variation. Percentiles were calculated based on the interannual mean and standard deviation (Table 5-14).

**TABLE 5-14: SPECIES SPECIFIC ANNUAL ABUNDANCES\***

Species	Average	Variance	Max	Inter-annual Average <sup>a</sup>	Inter-annual Variance <sup>a</sup>	Inter-annual Standard Deviation <sup>a</sup>	Percentiles		
							10%	20%	25%
Spotted Sandpiper	0.42	0.62	5	0.38	0.07	0.26	0.05	0.16	0.21
Warbling Vireo	0.78	0.85	4	0.78	0.08	0.28	0.41	0.54	0.59
Yellow Warbler	0.54	0.83	5	0.50	0.09	0.31	0.11	0.24	0.29
Song Sparrow	1.55	1.65	6	1.50	0.17	0.41	0.97	1.15	1.22
Black-headed Grosbeak	0.84	1.10	5	0.81	0.10	0.32	0.41	0.55	0.60
<b>Sum</b>	<b>4.13</b>	<b>8.37</b>	<b>18</b>	<b>3.97</b>	<b>1.28</b>	<b>1.13</b>	<b>2.52</b>	<b>3.02</b>	<b>3.21</b>
<p>*NOTE: Yosemite Valley point count data were collected by Point Reyes Bird Observatory scientists in 2006-2007 (Stillwater Sciences 2008) and NPS biologists in 2010-2011 (NPS unpublished data). Table 5-13 describes the species codes. Units are the number of detections per plot—the number of birds seen or heard at a plot, averaged across the three annual visits per plot. Species specific annual abundances (average, variance, and maximum abundance); interannual (year to year) average, variance, and standard deviation; and percentiles are based on the interannual average and standard deviation. Values are calculated from four years of point count data (2006, 2007, 2010, and 2011) collected in Yosemite Valley.</p> <p><sup>a</sup> Computed by first calculating the within-year average across sites and dates for each year, then taking the average, variation, and standard deviation of those annual averages. (The Interannual average differs from the individual average because it weights years equally while the individual average effectively weights years by the "Plot by Date" effort.)</p> <p><sup>b</sup> Percentiles are based on the interannual average and standard deviation, and are the values that abundances are expected to be below N% of the time due to random fluctuations as observed in the four years of pilot data.</p>									

In any given year, random population fluctuations may be less than the values for the 25<sup>th</sup> percentiles. To fall below the management standard, such poor years would have to occur 7 or more times per decade. To fail to meet the management standard for any individual species, the decline would have to be directly associated with ORV 2 in Yosemite Valley. If similar declines were observed in other nearby riparian habitats (e.g., Wawona Meadow, Tuolumne River riparian corridor), the management standard would still be met, though the reasons for the decline would still need to be determined. The management standard is set to safeguard against the chance of falling below the standard due to chance fluctuations while being sensitive enough to be triggered if the riparian ORV in Yosemite Valley becomes ecologically dysfunctional.

There may be certain instances when the management standard needs to be re-evaluated and potentially readjusted: a natural event (flood, fire, or drought) that does not pertain to human use causes the target threshold to be exceeded; another dataset from Yosemite shows more variation than expected annual variation; or any individual species disappears across all sites.

### *Adverse Effect*

An adverse effect would be present when the average abundance of any individual species or the average abundance summed across all species falls below the 20th percentile of the respective distributions in at least four out of 10 years, unless a species shows similar declines in other nearby riparian habitat not in Yosemite Valley. As Table 5-14 indicates, falling below those percentiles would indicate that the bird species are becoming less common. For example, warbling vireo sightings would be declining from 0.59 averaged across all three observation periods in a year (the management standard, to less than 0.54 in a year (the adverse effect level). Or, the summed sightings would fall from 3.21 across all three observation periods in a year (the management standard), to less than 3.02 in a year (the adverse effect level).

Because of the fluctuations that are possible from year to year, the duration of four out of 10 years is used. This accounts for stochastic events, such as flooding or fire (both of which have occurred in Yosemite Valley in the last couple of decades) that could temporarily drop a bird's population. If such an event occurred, it is reasonable to assume that the habitat and bird community would change, but would remain below the 20th percentile threshold in fewer than four out of 10 years. If rebounding did not occur and human-use factors are identified as the cause of adverse effect, then mitigation to reverse impacts would be necessary to restore ecological function.

There may be certain instances when the point of adverse effect needs to be re-evaluated and potentially re-adjusted: a natural event (flood, fire, or drought) that does not pertain to human use causes the adverse effect threshold to be exceeded; another dataset from Yosemite shows more variation than expected annual variation; or any individual species disappears across all sites. As explained in the triggers discussion below, the NPS is committed to ensuring adverse effects or degradation do not occur, through the multiple levels of management triggers.

### *Degradation Standard*

Degradation would be present when the average abundance of any individual species or average abundance summed across all species falls below the 10th percentile of the respective distributions in at least five out of 10 years, unless a species shows similar declines in other nearby riparian habitat not in Yosemite Valley. As Table 5-14 indicates, falling below those percentiles would indicate that the bird species are becoming considerably less common. For example, spotted sandpiper sightings would be declining from 0.21 averaged across all three observation periods in a year (the management standard), to less than 0.05 in a year (the



degradation level)—a decline of more than 75%. Or, the summed sightings would fall from 3.21 across all three observation periods in a year (the management standard), to less than 2.52 in a year (the adverse-effect level).

Because of the fluctuations that are possible from year to year, degradation is reached only when riparian bird abundances drop below the 10th percentile threshold in at least five out of 10 years. The duration of five out of 10 years accounts for stochastic events. If such an event occurred, it is reasonable to assume that the habitat and bird community would rebound above the 10% threshold in more than five out of 10 years. If rebounding does not occur and human use factors are identified as the cause of degradation, then mitigation to reverse degradation would take multiple years and a tremendous amount of effort and resources, but would be necessary to restore ecological function.

There may be certain instances when the point of degradation needs to be reevaluated and potentially readjusted: (1) a natural event (flood, fire, or drought, for example) that does not pertain to human use causes the degradation threshold to be exceeded; (2) another dataset from Yosemite shows more variation than expected annual variation; or (3) any individual species disappears across all sites. The NPS is committed to ensuring adverse effect or degradations levels are never met through the multiple levels of management triggers developed, as explained below.

### ***Monitoring Program for Riparian Bird Abundance***

As noted above, bird surveys would be conducted at the same randomly selected sites (N = 24) where vegetation and riverbank data are regularly collected through the Yosemite Visitor Use and Impact Monitoring Program (Newburger et al. 2009; Starcevich 2011). The NPS would conduct point count surveys using the peer-reviewed survey protocol developed by Siegel et al. (2010), and implemented throughout Yosemite each year as part of the Sierra Nevada Network bird-monitoring program. Annual data collected park-wide would provide an invaluable comparison if population trends are detected in impacted sites in Yosemite Valley. Each year during the breeding season (May 15-June 30), the NPS would conduct three sets of bird surveys at each of the 24 plots. In a given year, each set of surveys would be spaced at least ten days apart. To reduce sample bias, observers would be highly trained and have at minimum five years of bird survey experience; survey locations would not change during the season or between years; surveys would begin within ten minutes of official local sunrise and must be completed by 3.5 hours after official local sunrise, because bird activity tends to decrease later in the morning; and surveys would only take place under mild weather conditions. For a more detailed description of the survey protocol, see Siegel et al. (2010). Table 5-15 depicts the trigger points and management response to riparian bird abundance ratings.

While actions under the trigger points should prohibit falling below the management standard, unforeseen circumstances could occur. Plots that exhibit declines that fall below the management standard would require a comprehensive analysis of causal relationships for informing effective restoration actions. Restoration actions would be guided by identifying specific elements or attributes of habitats used by affected bird focal species. Earlier studies on bird-habitat associations emphasized general structural characteristics of vegetation (Wiens 1969; Willson 1974; Cody 1985), while more recent studies have identified the importance of specific tree species for riparian-dependent birds (Strong and Bock 1990; Saab 1999). Nur et al. (2008) reported that local vegetation and habitat characteristics were important in explaining variation in local abundance. Concurrent with active habitat restoration, removal of anthropogenic use of the impacted riparian habitats (e.g., willow and cottonwood stands) adjacent to the river may occur.

**TABLE 5-15: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR MID-ELEVATION RIPARIAN HABITAT (RIPARIAN BIRD ABUNDANCE)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> Mean abundance of two or more individual species drop below the 10th percentile threshold for one year or the mean abundance summed across species drops below the 20th percentile threshold in two out of three years	For each plot, assess riparian bird assemblage and extent of human impacts. Compare the mean abundance of birds (individual species and summed across species) in pristine versus potentially impacted plots. Pristine versus impacted sites would be identified based on an index of human use and the structural integrity of the riparian vegetation. For those potentially impacted plots that have lower bird abundance, assess any changes in vegetation attributes and human use that may be causing declines in riparian birds. If anthropogenic activities are identified as causal mechanisms of declining riparian bird populations, then implement actions to limit the extent and magnitude of effects (i.e., human impacts or management practices). Actions could include visitor messaging, restoration signs, and targeted vegetation restoration.	Management action to assess vegetation attributes and human use at potentially impacted sites would refine our understanding of baseline conditions and causal mechanisms (altered riparian habitat function, natural processes, external factors, or cumulative effects) affecting localized riparian bird integrity.
<b>Trigger Point 2:</b> Mean abundance of two or more individual species are below the 10th percentile threshold in three out of five years or the mean abundance summed across species is below the 5th percentile threshold in five out of seven years.	For those potentially impacted plots that have lower bird abundance, assess any changes in vegetation attributes and human use that may be causing declines in riparian birds. If anthropogenic activities are identified as causal mechanisms of declining riparian bird populations, then implement actions to limit the extent and magnitude of effects (i.e., human impacts or management practices). Actions could include restoration practices at those impacted sites where riparian birds have declined. Such practices could include visitor messaging, restoration signs, fencing, and habitat restoration to restore vegetation attributes related to higher riparian bird abundances (determine by statistical analyses). Actions may also include hard closures of individual impacted areas, including increased visitor education surrounding closures and riparian vegetation impacts. Closure regulations would be represented within the superintendent's compendium to allow for law enforcement.	If this trigger point is exceeded after 5 years, there would be another 5 years left before the management standard would be exceeded. This would provide enough time for focused visitor education and vegetation restoration to avert failing the management standard.

### *Management Concerns and Protective Actions*

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Tables 5-10, 5-12, or 5-15 above, which present the trigger point values for the three indicators (meadow fragmentation resulting from informal trails, the status of riparian habitat, and riparian bird abundance) used to monitor meadow and riparian conditions for ORV 2: Mid-elevation meadows and riparian habitat in Yosemite Valley.

Management concerns are present in relation to the meadow fragmentation indicator. The fragmentation standard (LPI<sub>3</sub>) is a weighted mean of 93% in Segment 2, with no meadow less than 90%. Several Yosemite Valley meadows (Cook's A, El Capitan, Leidig, and Slaughterhouse A) have a fragmentation standard of less than 90%, as shown in Table 5-7. Ensuring that these meadows are in compliance at the individual meadow level will ensure that the ORV is protected at the Segment level. To address the management concerns related to meadow fragmentation triggers, the NPS will take the following actions as specified in Table 5-10 and Alternatives 2-6:

- Remove informal trails in meadows where they fragment meadow habitat or cross through sensitive, wet vegetation communities. Overall, restore six miles of informal trails throughout Yosemite Valley.
- Use boardwalks or hardened surfaces to allow access to sensitive areas
- Delineate trails through upland areas and along meadow perimeters

- Place restoration closure signs, and/or fencing along meadow perimeters
- Fill deep headcuts caused by informal trails with native soil and re-contour to natural meadow topography
- De-compact trampled soils, and use salvaged plants growing in trail ruts and local seed to revegetate area and consolidate multiple parallel trails
- Institute closures in individual impacted meadows, and increase visitor education associated with the closures

Surveys in 2010 indicate that management concerns are also present in terms of the riparian status indicator. These surveys indicated that about 20% of the riparian area along the Merced River in Yosemite Valley was in low condition, and approaching an adverse effect (30% of the riparian habitat in low condition). These impacts are highly localized. To address this management concern, the NPS will:

- Re-vegetate riverbanks between Clark's Bridge and Sentinel Bridge with native riparian shrubs and trees, and strategically place wood to promote bar formation and natural channel narrowing.
- Utilize temporary closures to sensitive resource areas to allow natural recovery along riverbanks.
- Re-direct visitor use to more stable and resilient river access points such as sandbars, and designate formal river access sites. Establish fencing and signage to protect sensitive areas; install boardwalks where appropriate, and actively re-vegetate where needed.
- Construct hardened structures at designated river access points where needed to facilitate and concentrate safe visitor access. Fence and sign sensitive areas and re-establish riparian vegetation.
- Locate any new structures at least 150 feet from the ordinary high-water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high-water mark.

The NPS is beginning to monitor the third indicator in this segment, riparian bird abundance. A baseline for this indicator is in place to monitor the status of the indicator through time. The first status assessments will take place in 2013, after one year of monitoring. The next assessment requires information from two out of three years. In 2013, the NPS will determine if initial triggers are achieved. Confirmation of the presence or absence of adverse effects or degradation requires 10 years of monitoring data.

### ***Management Considerations and Enhancement Actions***

In general, actions proposed to address meadow and riparian considerations in Segment 2 would improve meadow hydrology and topography, install or extend boardwalks to reduce meadow trampling, fill drainage ditches not serving current operational needs, remove abandoned infrastructure, and remove conifer seedlings and saplings from meadows. The following actions are common to Alternatives 2-6:

- **Meadow hydrology:** Construct wide box culverts to enhance natural water flows into meadows, and formalize or remove road shoulder parking. Restore hydrologic processes to increase sheet flow into meadows to sustain native meadow vegetation and limit conifer growth where possible. Target areas include Sentinel Meadow, Cook's Meadow, El Capitan Meadow, Stoneman Meadow, and other meadows as necessary.
- **Meadow habitat:** Restore denuded vegetation in Leidig Meadow, El Capitan Meadow, Ahwahnee Meadow, Sentinel Meadow, Stoneman Meadow, and other meadows as necessary. Protect re-vegetated areas with fencing or other natural barriers and install signs to prevent vegetation trampling. Replace a section of paved trail in Leidig meadow (within ordinary high-water mark of the river) with an elevated boardwalk. Develop or extend boardwalks to accommodate visitors and reduce meadow

trampling. Fill ditches not serving current operational needs using adjacent soil or pond-and-plug techniques. Manually or mechanically remove conifer seedlings and saplings from meadows.

- **Riparian habitat buffers:**<sup>27</sup> Relocate or remove all campsites within 100 feet of the ordinary high-water mark. Establish a riparian buffer and prohibit new development along both sides of the Merced River within 150-feet of the ordinary high-water mark. Move the Yosemite Village Day-use Parking Area 150 feet north of the Merced River. Restore riverside areas of Backpackers, North Pines, and Lower Pines campgrounds to natural riparian conditions.
- **Abandoned infrastructure in meadow and riparian habitat:** Remove abandoned infrastructure (including tiles, pipes, and abandoned roads) from meadow, riparian, and floodplain habitat. Decompact soils, remove fill, and re-vegetate with riparian species. Address areas including the former Eagle Creek/Rocky Point Sewage Plant site, Royal Arches Meadow, Cook's Meadow, western (closed) portion of former Lower Pines Campground, and the former lodge cabin/volunteer center at Yosemite Lodge.
- **Riparian restoration and river access:** Use brush layering and other re-vegetation techniques to repair localized riverbank erosion and lessen the scouring effect associated with bridges. Direct visitor use on the banks of the Merced River to stable and resilient river access points such as sandy beaches and low-angle slopes. Install fencing and signs to protect sensitive areas such as steep riverbanks and high use areas that exhibit vegetation loss and eroded soils. Protect re-vegetated areas with closure signs, fencing, and/or natural barriers such as rocks and logs. Riverbanks that would be addressed include those adjacent to Lower Pines and North Pines Campgrounds, Housekeeping Camp, Yosemite Lodge beach access, Swinging Bridge Picnic Area, Sentinel Beach Picnic areas, Cathedral Beach Picnic Area, Devi's Elbow, riverside areas between Pohono Bridge and the El Portal Road/Big Oak Flat Road intersection, and along the Valley Loop Trail. Remove the pack stock trail along the river between the Concessioner Stables and Happy Isles, and re-direct stock use to the Valley Loop Trail. See Appendix E for a detailed description of ecological restoration actions.

<sup>27</sup> A riparian buffer is a strip of riparian vegetation along the banks of a river that filters runoff and provides a transition zone between the river and human land use (e.g., Osbourne and Kovacic, 1993). The concept of a riparian buffer to protect river resources is well established in the scientific literature and has been applied by numerous federal, state, and local land management agencies (e.g., Welch, 1991; Wenger, 1999; Lee et al., 2004; Mayer et al., 2006).

The primary justifications for employing a riparian buffer along the Merced River are to protect water quality and riparian habitat. In terms of water quality, riparian buffers help trap pollutants that could otherwise directly enter the river. Buffers reduce the magnitude and velocity of overland flow, trap sediment, and attenuate compounds such as nitrogen and phosphorous and pathogens such as *E. coli* (e.g., Osbourne and Kovacic, 1993; Mayer et al., 2005; Tate et al., 2006; Hoffmann et al., 2009). Riparian buffer vegetation helps to stabilize riverbanks through provision of root cohesion on banks and floodplains, reduce erosion, and allow surface water to infiltrate the soil. Riparian buffer vegetation provides a source of large wood to the river and adjacent floodplain, which dissipates river flow energy and regulates channel form (Montgomery et al., 2003). In terms of habitat, riparian buffers enhance important habitat for birds and other wildlife by allowing establishment of new vegetation and persistence of a complex habitat structure (e.g., Darveau et al., 1995, 2001; Whitaker and Montevicchi, 1999). Buffers also protect aquatic ecosystems by providing organic nutrients, by supplying woody debris that improves habitat complexity, and by moderating water temperatures by vegetative shading of the river (e.g., France et al., 1996; Karr and Schlosser, 1977).

The effective width of a riparian buffer depends on the steepness of the local topography, the floodplain extent, soil type(s), vegetation type(s), local wildlife species, and the nature and extent of human land use (e.g., Lee et al., 2004; Hawes and Smith, 2005; Mayer et al., 2006). As a result of these numerous factors, as well as the inherent variability and complexity of river system processes, there are no singular, generic standards for riparian buffer widths. Review of scientific literature indicates a range of recommended buffer widths, with values generally ranging between a minimum of 30 feet and a maximum of 300 feet (Castelle et al., 1994; Wenger, 1999; Lee et al., 2004; Mayer et al., 2006); typical values fall between 50 and 150 feet. In general, larger buffers afford greater levels of river protection. Because the riparian buffers proposed herein are designed to protect a Wild and Scenic River within a National Park and World Heritage site, a strong level of river protection is desired.

- **Ahwahnee Meadow:** Restore meadow to natural conditions by restoring meadow topography, removing abandoned irrigation lines and associated fill material, filling in ditches, and re-vegetating with native meadow vegetation. Remove the abandoned tennis courts from the black oak woodland. Re-connect fragmented portions of Ahwahnee Meadow by removing conifers and re-contour topography to increase the size of the meadow 5.7 acres.
- **Bridalveil Meadow:** Address the condition of the stream in Bridalveil Meadow, which exhibits “headcutting,” by inserting willow cuttings into disturbed sites in the stream channel, banks of the Merced River, and the adjacent meadow. Re-establish the riparian shrub layer in the meadow to restore the diversity of meadow and riparian habitat.
- **Native Plant Communities in River Corridor:** Restore the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest at specific locations in Yosemite Valley (67 potential acres). Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure re-design.
- **Declining amphibian and reptile species:** In accordance with NPS Policy, continue management toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize studies of the Western pond turtle and the foothill yellow-legged frog.

The alternatives propose a variety of actions and solutions to address other meadow and riparian considerations. Alternatives 2-6 would restore the Merced River corridor to natural conditions as follows:

Alternative 2: 347 acres ecological restoration

Alternative 3: 302 acres ecological restoration

Alternative 4: 223 acres ecological restoration

Alternative 5: 203 acres ecological restoration

Alternative 6 : 170 acres ecological restoration

- **Ahwahnee Meadow:** Alternatives 2 and 3 would re-route meadow trails outside of wetlands, and consolidate trails with the Housekeeping Footbridge trail where possible. In addition, alternatives would remove associated fill and restore wetland areas where trails are removed, and remove 900 feet of Northside Drive and relocate the parallel bike path to the south to improve connectivity between the meadow and the river. Alternatives 4, 5, and 6 would remove fill from wetlands and sensitive areas, and install a 350-foot boardwalk to traverse wet areas. Northside Drive and the associated bike path would remain in the current configuration, and culverts would be added to improve hydrologic connectivity.
- **Indian Creek / Ahwahnee Row and Tecoya Dorms Concessioner Employee Housing:** Alternative 2 would remove housing and development between the Village Store and Ahwahnee Meadow; recontour topography using 1919 maps as a guide; restore hydrologic functions of Indian Creek; and revegetate the area with native meadow and riparian vegetation. Alternatives 3, 4, 5, and 6 would retain concessionaire employee housing in the area and establish a 50-foot setback from Indian Creek for new development; existing incompatible uses would be removed from the setback.
- **El Capitan Meadow:** Alternative 2 would restore all informal trails in the meadow to natural conditions, reduce roadside parking, and consolidate parking in the west end of the meadow. Parking for search and rescue efforts would remain. Alternatives 3 and 4 would utilize fencing and signage to designate appropriate meadow access points and remove all informal trails in sensitive, frequently inundated, or incised meadow habitat. Alternatives 5 and 6 would install fencing along the northern perimeter of meadow and designate appropriate access points using boardwalks and viewing platforms.
- **Former Upper and Lower Rivers Campground:** Alternatives 2-3 and 5 would restore 35.6 acres of floodplain/riparian/wetland habitat within the 10-year floodplain. This includes actions to remove remnant asphalt, decompact soils, and re-establish seasonal channels and natural

topography. Alternatives 4 and 6 would restore 19.7 acres of floodplain topography and riparian/wetland habitat within 150 feet of the ordinary high-water mark of the Merced River. This includes actions to remove remnant asphalt, decompact soils, and re-establish overflow channels where possible. No development would occur in the former campground site in Alternatives 2-3, but new campsites and related infrastructure would be built in Alternatives 4-6 with minimal impact expected on the landscape. Alternative 5, specifically, would accommodate 30 new walk-in campsites in Upper River Campground and eight picnic tables at the former Lower River Campground. In Alternatives 4 and 6, there would be 30 walk-in campsites and 2 group sites in Upper River and 40 walk-in sites in Lower River. As additional ecological protections in Alternative 5, large box culverts would be installed under the road to accommodate water flows that sustain riparian and wetland habitats, and fencing would be constructed along sections of the riverbank to guide visitor use to less sensitive areas. In Alternatives 4 and 6, the Upper River riparian zone would be fenced and closed to prevent riverbank trampling.

- **Housekeeping Camp:** Alternatives 2 and 3 would remove all lodging units and riverside revetment at Housekeeping Camp from within the 100-year floodplain and restore 19.4 acres of floodplain and riparian habitat to natural conditions. The area would be reconfigured for day-use river access, a rafting put-in, and picnicking. Alternative 4 would remove 166 lodging units at Housekeeping Camp (83 duplex lodging units, 4 restrooms, store and office) out of the ordinary high-water mark retaining a total of 100 units. Restrooms, shower houses, and laundry would remain. Alternatives 5 and 6 would remove a total of 34 units, commensurate with the decision in the Concession Services Plan/ Supplemental Environmental Impact Statement (1992), allowing restoration of about one acre of riparian habitat. The existing fencing along the riverbank would be adjusted to protect restored riparian habitat.
- **Stoneman Meadow and Curry Orchard Parking Area:** Alternatives 2, 3, and 4 would restore hydrologic and habitat connectivity in Stoneman Meadow by removing the 1,335-foot long segment of Southside Drive that bisects Stoneman Meadow and extend the boardwalk to Curry Village up to 275 feet and realign the road through Boys Town. Alternative 5 would remove roadside parking along the road through Stoneman Meadow, allowing removal of unnatural fill re-vegetation of the area. The fenced area on the north end of the meadow near Lower Pines Campground would be expanded to protect wetlands. The NPS would conduct transportation and engineering studies to examine the potential to remove Northside Drive from the meadow under Alternative 5. All alternatives would redesign or improve the Orchard parking area to promote water flows from cliff walls to Stoneman Meadow and to remove apple trees from the Orchard parking area to mitigate human-bear encounters.
- **Valley Loop Trail:** Alternatives 2, 3, and 4 would re-route the portion of the trail in Slaughterhouse Meadow that runs through wetland habitat to an upland area. Alternatives 5 and 6 would construct a boardwalk through this wet area. All alternatives would move a 780-foot segment of the trail through Bridalveil Meadow to the base of the fill slope of the Valley Loop Road.
- **Yosemite Lodge:** Alternative 2 would remove all buildings except for the core portion of the Lodge complex which houses the cafeteria. Alternative 3 would remove four buildings from the 100-year floodplain. All alternatives would restore new undeveloped areas (that differ in size per alternative) to natural conditions; de-compact soils; recontour topography using 1919 maps as a guide, and plant native vegetation.
- **Backpackers Campground:** Under Alternative 5, 10 sites would remain and 15 sites within 100 feet of the ordinary high-water mark would be removed, to be restored with native plant communities. In addition, 16 campsites would be added west of Backpackers Campground.

Additional considerations related to fire management and non-native species control would be addressed through actions prescribed in the *Yosemite National Park Fire Management Plan* (NPS 2004) and the *Invasive Plant Management Plan Update* (NPS 2010). ORV 6—the Merced River as an outstanding example

of a rare, mid-elevation alluvial river—presents additional management considerations and associated actions to enhance riparian habitat.

***Conclusion: Protecting and Enhancing ORV 2 (mid-elevation meadows and riparian habitat)***

The NPS will monitor three indicators to assess the condition of ORV 2: meadow fragmentation resulting from informal trails, the status of riparian habitat, and riparian bird abundance.

Adverse effects and degradation are not present in relation to the meadow fragmentation indicator. Management concerns are present, as preliminary data collection indicates that a trigger point for the fragmentation standard (LPIs) has been exceeded. Actions to address informal trailing impacts and fragmentation will be taken at all meadows where these triggers have been tripped. Actions to address these management concerns are found in Table 5-10.

Initial surveys of the riparian status indicator in 2010 indicate that degradation is not present, but management concerns are present, with conditions approaching an adverse effect. To address this management concern, the NPS will re-vegetate riverbanks between Clark's Bridge and Sentinel Bridge with native riparian shrubs and trees, strategically place wood to promote bar formation and natural channel narrowing, utilize temporary closures to allow natural recovery along riverbanks, re-direct visitor use to more stable and resilient river access points and establish fencing and signage to protect sensitive areas, install boardwalks where appropriate, construct hardened structures at designated river access points to concentrate safe visitor access, locate new structures at least 150 feet from the ordinary high-water mark, and relocate or remove all campsites at least 100 feet away from the ordinary high-water mark.

The NPS is beginning to monitor the third indicator in this segment, riparian bird abundance. The first status assessments will take place in 2013, after one year of monitoring. The next assessment requires information from two out of three years. Confirmation of the presence or absence of adverse effects or degradation requires 10 years of monitoring data.

Additional management considerations related to ORV 2 are present. Under Alternatives 2-6, the NPS will fill in ditches and re-contour meadow topography, expand the role of fire in maintaining meadows, and restore the abandoned golf course at The Ahwahnee to natural conditions. Alternatives 2-6 also consider a range of options for large-scale ecological restoration in historic riparian/ meadow/ floodplain complexes, reduce impacts of formal trails in meadows, reduce hydrological impacts of the road that runs through Sentinel Meadow, and reduce meadow impacts that result from roadside parking. In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed.

To ensure this biological ORV is protected and enhanced through time, the NPS would continue to monitor the condition of the ORV using these three indicators. Monitoring would provide early warning of conditions that require management action before impacts occur. These measurable conditions would trigger specific management responses, as described in Table 5-10, Table 5-12, and Table 5-15.

## Biological ORV—Sierra Sweet Bay (*Myrica hartwegii*)

**ORV 3—The Sierra sweet bay (*Myrica hartwegii*) is a rare plant found on riverbanks along the South Fork Merced River.**

**Location:** Segments 7 (Wawona) and 8 (South Fork Merced River below Wawona)

**Rationale:** In Wawona and downstream, the South Fork Merced River provides habitat for a rare plant, the Sierra sweet bay (*Myrica hartwegii*). This special-status shrub is found in only five Sierra Nevada counties. In Yosemite, it occurs exclusively on sand bars and riverbanks along the South Fork Merced River downstream from Wawona and along Big Creek.

**Management Objective:** Manage the Sierra sweet bay population to protect the abundance of the population along the South Fork Merced River

### *ORV Condition at the Time of Designation (1987)*

At the time of designation, botanists considered the Sierra sweet bay to be rare in Yosemite, but not threatened by local impacts.

### *Current ORV Condition*

The Sierra sweet bay population in Yosemite National Park is in good condition (Colwell and Taylor 2011). The only known human impact is minor localized trampling associated with recreational river access near the Wawona Campground.

### *Management Program for ORV 3 — Sierra Sweet Bay*

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program.

### **Indicator – Sierra Sweet Bay Population Decline**

Permanent photo points would be established to monitor the integrity of the of Sierra sweet bay population along the South Fork Merced River. Comparison of repeat photos can be expected to be a more effective surrogate for assessing human disturbance than more complicated and costly monitoring strategies for this ORV. The health of this ORV would be determined by comparing populations located near Wawona Campground (an area that is likely to be disturbed by humans) with more remote populations that are less likely to receive such disturbance. Monitoring would occur every five years. When photos indicate a decline in sweet bay abundance, the population can be re-mapped and compared to the original mapped extent of Sierra sweet bay completed in 2010 (Colwell and Taylor 2011) to determine if real declines have occurred in the population. Easily accessible potential reference stands are located away from direct effects associated with the Wawona Campground and along Big Creek.

### *Management Standard*

The management standard for Sierra sweet bay would be achieved if the abundance of populations along the South Fork Merced River within Yosemite National Park is maintained at >80% of the reference stands.

The management standard establishes a low tolerance for human-caused decline in population size so that population decline caused by human disturbance can be reversed if detected early. This species is adapted to



spatial and temporal modifications to its habitat resulting from periodic hydrologic events, such as 50- and 100-year floods or periodic fires. Resulting natural fluctuations in population size indicated by all populations declining in size by a similar amount would not be mitigated under this ORV. Also, population declines resulting from global environmental change (e.g., invasive species, disease, changing precipitation patterns), even if anthropogenic in origin, are beyond the scope of this plan and would not be mitigated under this ORV.

### ***Adverse Effect***

An adverse effect would be present if there is a human-caused decline of over 40% in Sierra sweet bay abundance along measured reaches of the South Fork Merced River, as compared with reference stands.

### ***Degradation Standard***

Degradation would be present if there is a human-caused decline of over 70% in the abundance score of Sierra sweet bay occurs along measured reaches of the South Fork Merced River, as compared with reference stands. A 70% decline in the abundance score is estimated to be a level of decline that would be difficult to mitigate without a significant input of resources.

### ***Monitoring – Sierra Sweet Bay Population Abundance***

Permanent photo points would be established to help assess habitat condition and population persistence over time. Monitoring would occur every five years in Segments 7 (Wawona) and 8 (South Fork Merced River below Wawona). The mapped extent of Sierra sweet bay completed in 2010 (Colwell and Taylor 2011) would provide the basis for locating monitoring sampling units and for comparisons through time. Table 5-16 describes the trigger points that would inform managers that a response is required to avoid impacts on the ORV.

**TABLE 5-16: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR SIERRA SWEET BAY**

<b>Trigger Point(s) at Which Action Would Be Taken</b>	<b>Possible Management Actions</b>	<b>Rationale for Management Actions</b>
<b>Trigger Point 1:</b> Decline of 20% in Sierra sweet bay abundance across two monitoring periods.	Reduce localized human use of Sierra sweet bay habitat with the installation of fencing.	Because localized human use is the most likely source of human-caused decline in Sierra sweet bay population abundance along the South Fork Merced River, a reduction in human use is likely to reverse a declining trend.
<b>Trigger Point 2:</b> Decline of 30% in Sierra sweet bay abundance across two monitoring periods.	Reduce localized human use of Sierra sweet bay habitat with the installation of fencing Augment population by planting and protecting using cuttings or seeds from local population	Fence installation will reduce the effects of trampling, and the addition of more individuals derived from this population will enhance population abundance. Both of these management responses are likely to reverse a declining trend.

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-16 above. This population is in good condition, and management concerns are not present. Protective management action is not required at this time.

### ***Management Considerations and Enhancement Actions***

This population of Sierra sweet bay is in good condition, with management considerations not present. Management action to enhance the population is not required at this time.

### ***Conclusion: Protecting and Enhancing ORV 3 (Sierra sweet bay)***

The Sierra Sweet Bay ORV is determined to be absent of adverse effects and degradation and in good condition, based on 2010 surveys (Colwell and Taylor 2011). No immediate management concerns or considerations are present. To ensure that this biological ORV is protected and enhanced through time, the NPS would monitor the condition of the Sierra sweet bay population to ensure early warning of conditions that require management action before impacts occur. The monitoring indicator for Sierra sweet bay is coupled with triggers for specific management responses.

## **GEOLOGICAL AND HYDROLOGICAL ORVs**

This section describes the program to protect and enhance each Geological/Hydrological ORV as proposed in the *Merced River Plan/DEIS*. Four Geological/Hydrological ORVs exist in the Merced River corridor, each related to specific segment(s) of the river (Table 5-17).

**TABLE 5-17: GEOLOGICAL/HYDROLOGICAL ORVs AND ASSOCIATED INDICATORS**

<b>ORV Number and Key Resource</b>	<b>Segment(s)</b>	<b>Indicator to be Monitored through Time</b>
4. Glacially-carved Canyon in Upper Merced River Canyon	1	None; the ORV is impervious to human disturbance
5. The "Giant Staircase"	2	None; the ORV is impervious to human disturbance
6. A Rare, Mid-elevation Alluvial River	2	1. The California Rapid Assessment Method (CRAM)
7. Boulder Bar in El Portal	4	None; the ORV is impervious to human disturbance

### **Geological/Hydrological ORV—Glacially-carved Canyon in Upper Merced River Canyon**

<b>ORV 4—The upper Merced River canyon is a textbook example of a glacially-carved canyon.</b>
<b>Location:</b> Segment 1 (Merced River above Nevada Fall)
<b>Rationale:</b> This segment of the Merced River is characterized by a large-scale, glacially-carved canyon. The section of the Merced River above Bunnell Point, in particular, illustrates the relationship between geology and river course owing to its sweeping, glacially carved granite canyon cradling the river.
<b>Management Objective:</b> Manage to allow natural processes to shape the landscape and associated geologic values.

### ***ORV Condition at the Time of Designation (in 1987)***

This Geologic ORV was unaffected by human activities at the time of designation.

### ***Current ORV Condition***

Natural processes would continue to shape the landscape and associated geologic values. Human intervention has not perceptibly modified this Geologic ORV.

### ***Management Program for ORV 4***

It is very unlikely that this ORV would ever be affected by human intervention. Because the ORV is essentially impervious to intended human activities, no indicator will be used to monitor it. For the same reason, management standard, adverse effect, and degradation are not defined for this ORV, and the NPS will not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### ***Management Considerations and Enhancement Actions***

The NPS has no immediate management considerations with respect to the U-shaped, glacially carved canyon along the Merced River above Nevada Fall. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection under WSRA is necessary.

### ***Conclusion: Protecting and Enhancing ORV 4 (glacially-carved canyon in Upper Merced River Canyon)***

This Geologic ORV is determined to be absent of adverse effects and degradation. No immediate management considerations are present, and it is unlikely that this ORV would be affected by human intervention in the future. The NPS would not monitor the condition of this ORV.

## **Geological/Hydrological ORV—“Giant Staircase”**

**ORV 5—The “Giant Staircase,” which includes Vernal and Nevada Falls, is one of the finest examples in the western United States of stair-step river morphology.**

**Location:** Segment 2 (Yosemite Valley)

**Rationale:** Dropping over 594-foot Nevada Fall and then 317-foot Vernal Fall, the Merced River creates what is known as the Giant Staircase. Such exemplary stair-step river morphology is characterized by substantial variability in river hydrology, from quiet pools, such as Emerald Pool, to the dramatic drops in the waterfalls.

**Management Objective:** Manage to allow natural processes to shape the landscape and associated geologic values.

### ***ORV Condition at the Time of Designation (1987)***

The rocky cliffs, cascades, and broad valleys along the Merced River represent a nationally significant example of a glaciated landscape. Sierra Nevada landforms were well established before glaciation, and major stream drainages provided the avenues that the glaciers would later follow. The course of the present-day Merced River is determined by the path of glaciers that came and went during the geological epoch known as the Pleistocene (10,000 to 1.8 million years ago). These glaciers transformed valleys from V-shaped to U-shaped, left hanging valleys along their lower reaches, and deposited thick packages of glacial till—ultimately shaping the iconic landscapes for which Yosemite Valley and the upper Merced River are known. Most researchers agree that at least three major glacial advances, or stages, have taken place: the Tioga, the Tahoe, and a much older pre-Tahoe (possibly the Sherwin) (Huber 1989). The Tioga Glaciation is

considered to have peaked around 20,000 years ago, but the precise timing of the earlier stages is still a topic of debate. Because these are massive landscape-wide natural events well beyond human control, this Geologic ORV was unaffected by human activities at the time of designation.

### ***Current ORV Condition***

Natural processes would continue to shape the landscape and associated geologic values. Human intervention has not perceptibly modified this geologic ORV.

### ***Management Program for ORV 5***

It is very unlikely that this ORV would ever be affected by human intervention. Because the ORV is essentially impervious to intended human activities, no indicator will be used to monitor it. For the same reason, management standard, adverse effect, and degradation are not defined for this ORV, and the NPS will not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### ***Management Considerations and Enhancement Actions***

Natural processes would continue to shape the landscape and the geologic value. The NPS has no immediate management considerations with respect to the Giant Staircase characteristic of the geology of Yosemite Valley above Happy Isles.

Because there are no considerations regarding the condition of this ORV, no actions other than continued protection under WSRA are necessary.

### ***Conclusion: Protecting and Enhancing ORV 5 (“Giant Staircase”)***

This Geologic ORV is determined to be absent of adverse effects and degradation. No immediate management considerations are present, and it is unlikely that this ORV would be affected by human intervention in the future. The NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

## **Geological/Hydrological ORV—A Rare, Mid-elevation Alluvial River**

**ORV 6—The Merced River from Happy Isles to the west end of Yosemite Valley provides an outstanding example of a rare, mid-elevation alluvial river.**

**Location:** Segment 2 (Yosemite Valley)

**Rationale:** In Yosemite Valley, the Merced River is alluvial, characterized by a gentle gradient, a robust flood regime with associated large woody debris accumulation, and complex riparian vegetation. There are few examples in the Sierra Nevada of similar river morphology of this scale at this elevation (about 4,000 feet).

**Management Objective:** Protect and enhance natural geologic and hydrologic processes, such as overbank flooding and channel migration, which sustain river values such as meadow and riparian communities.

### ***ORV Condition at the Time of Designation (1987) and Current Condition***

This ORV integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities. For condition of the ORV, see the Free-Flowing Condition section in this chapter, and ORV 2 in this chapter concerning riparian and meadow communities in Yosemite Valley.

## ***Management Program***

The status of riparian habitat, as measured by the California Rapid Assessment Method (CRAM) (Collins et al. 2008) would be used to monitor the condition of this ORV through time. This is one of the same indicators used to monitor ORV 2. The indicator, management standard, definitions of adverse effect and degradation, monitoring program, and trigger points for management response are the same as ORV 2, as described earlier in this chapter.

## ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached a trigger point, or when adverse effects or degradation are present. As noted in the discussion of ORV 2, surveys in 2010 indicate that management concerns are present in terms of the riparian status indicator, with about 20% of the riparian area along the Merced River in Yosemite Valley in low condition and approaching an adverse effect (30% of the riparian habitat) in low condition.

To address this management concern, the NPS will:

- Re-vegetate riverbanks between Clark's Bridge and Sentinel Bridge with native riparian shrubs and trees, and strategically place wood to promote bar formation and natural channel narrowing.
- Utilize temporary closures to sensitive resource areas to allow natural recovery along riverbanks.
- Re-direct visitor use to more stable and resilient river access points such as sandbars, and designate formal river access sites. Establish fencing and signage to protect sensitive areas; install boardwalks where appropriate, and actively re-vegetate where needed.
- Construct hardened structures at designated river access points where needed to facilitate and concentrate safe visitor access. Fence and sign sensitive areas and reestablish riparian vegetation.
- Locate any new structures at least 150 feet from the ordinary high-water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high-water mark.
- Move Yosemite Village Day-use Parking Area north more than 150 feet away from the ordinary high-water mark.

## ***Management Considerations and Enhancement Actions***

Management considerations regarding fundamental alluvial processes in Yosemite Valley include accelerated riverbank erosion in localized areas, lack of natural levels of large wood in the river system, altered surface and groundwater flow patterns, and alterations to the distribution and extent of connected floodplain. Accelerated riverbank erosion is associated with high levels of foot traffic and resulting loss of riparian vegetation. Without riverbank vegetation, the potential for erosion increases, as vegetation holds unconsolidated soils in place. Since the beginning of the 20th century, the river in Yosemite Valley widened an average of 27% and up to 100% between Clark's Bridge and Sentinel Bridge, compared to widening downstream of this location of just 4% (Madej, 1991 and 1994).

The NPS removed large wood from the river channel for many decades to reduce risks to bridges and other infrastructure during flood stages, and to improve safety by removing in-stream obstacles. The long-term removal of large wood in Yosemite Valley altered the structure and complexity of the river channel (Cardno ENTRIX, in review). Long-term wood removal also affected riparian habitat, as large wood is a source of nutrients, cover, and substrate for aquatic organisms (Montgomery and Piégay 2003). Removal of wood

reduces connectivity between the river and its floodplain (Abbe et al., 2003). The following action would take place under Alternatives 2-6 to address this issue:

- Manage large wood according to the management policy,<sup>28</sup> leaving large wood in the channel that does not compromise visitor safety or infrastructure.
- Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality.
- Place large wood in the Merced River to enhance channel complexity and mitigate scouring from bridges.
- Place eight constructed log jams in the river channel between Clark's Bridge and Sentinel Bridge.

Development and infrastructure, such as roads, ditches, trails, and abandoned utility lines, has likely altered surface and subsurface hydrology associated with the Merced River (Cooper and Wolf 2008).

Actions to address these considerations overlap with those listed under ORV 2 and the Free-flowing Conditions sections in this chapter.

### ***Conclusion: Protecting and Enhancing ORV 6 (a rare, mid-elevation, alluvial river)***

This ORV integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities in Yosemite Valley. Management concerns and considerations are both present. To remedy these, the *Merced River Plan/DEIS* proposes a variety of actions to address specific considerations in "Alternatives" (Chapter 8) to protect river values. In riparian zones under all alternatives, the NPS would direct river use to more stable and resilient access points, protect sensitive areas, and remove or relocate campsites within 100 feet of the ordinary high-water mark. The NPS would explore a range of options among the action alternatives for large-scale ecological restoration in historic riparian/ floodplain complexes, reduce hydrological impacts of the road that runs through Sentinel Meadow, and consider and evaluate a range of options to re-vegetate denuded riverbanks and limit future development directly adjacent to the Merced River.

To ensure this ORV is protected and enhanced through time, the NPS would monitor the condition of the ORV using the status of riparian habitat as an indicator, and the CRAM methodology, and take specific actions should conditions reach trigger points. These trigger points are selected to inform managers well in advance of adverse effects or degradation impacts on this ORV.

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<sup>28</sup> "Management of Fallen Trees in the Merced River in Yosemite Valley," NPS, 2012.

## Geological/Hydrological ORV—Boulder Bar in El Portal

**ORV 7—The boulder bar in El Portal was created by changing river gradients, glacial history, and powerful floods. These elements have resulted in accumulation of extraordinarily large boulders, which are rare in such deposits.**

**Location:** Segment 4 (El Portal)

**Rationale:** When river gradients lessen, rivers lose the energy needed to transport larger sediments. In such areas, bar-type deposits, such as the large boulder bar at the east end of El Portal, are built up. This is no ordinary boulder bar, however, for it contains massive boulders over a meter in diameter and weighing many tons. It is the combination of boulder availability, the steepness of the river in the gorge, the major change in gradient at El Portal, and the size of the Merced River's peak floods that enables the river to build such a boulder bar. As illustrated by the January 1997 flood, the Merced continues to sort and build this bar, providing evidence in all seasons of its potential power.

**Management Objective:** Manage to allow natural processes to shape the landscape and associated geologic values.

### *ORV Condition at the Time of Designation (1987)*

This Geologic ORV was unaffected by human activities at the time of designation.

### *Current ORV Condition*

Additional large boulders were deposited by a natural flooding event in 1997.

### *Management Program for ORV 7*

It is very unlikely that this ORV would ever be affected by human intervention. Because the ORV is essentially impervious to intended human activities, no indicator will be used to monitor it. For the same reason, management standard, adverse effect, and degradation are not defined for this ORV, and the NPS will not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### *Management Considerations and Enhancement Actions*

Natural processes would continue to shape the landscape and the geologic value. The NPS has no immediate management considerations with respect to the El Portal boulder bar. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection under WSRA are necessary.

### *Conclusion: Protecting and Enhancing ORV 7 (the El Portal Boulder Bar)*

The El Portal Boulder Bar ORV is determined to be absent of adverse effects and degradation. No immediate management considerations are present, and it is unlikely that this ORV would be affected by human intervention in the future. The NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

## CULTURAL ORVs

The continuum of human use along the Merced River and South Fork Merced River encompasses millennia of diverse peoples, cultures, and uses. American Indian and late 19th-century American cultures flourished along these rivers because they provided reliable, year-round water in extraordinary settings. Evidence that reflects trade, travel, and settlement patterns abounds in an intricate and interconnected landscape of archeological sites, traditional use sites, and historic resources representing this cultural history. The ongoing cultural traditions of contemporary American Indians and other ethnic heritages are linked through space and time to their respective prehistoric and historic pasts via these ethnographic and cultural landscapes. This landscape holds outstandingly remarkable scientific, interpretive, and cultural value for traditionally associated peoples and the public. This section describes how the NPS would protect and enhance the Cultural ORVs as proposed in the *Merced River Plan/DEIS*. As the parts of the cultural ORV are a linked landscape, in essence they are one ORV separated into seven parts. Each part is related to specific segment(s) of the river (Table 5-18). They shall be referred to as seven ORVs, from ORV 8 to ORV 14.

**TABLE 5-18: CULTURAL ORVs AND ASSOCIATED INDICATORS**

ORV Number and Key Resource	Segment	Indicator to be Monitored through Time
8. Yosemite Valley American Indian ethnographic resources	2	1. Meadow fragmentation due to the proliferation of informal trails 2. Status of riparian habitat 3. California black oak – number of adults and ratio of saplings to adults
9. The Yosemite Valley Archeological District	2	1. Condition of Yosemite Valley Archeological District
10. Yosemite Valley Historic Resources	2	1. List of Classified Structures Condition Assessments
11. The El Portal Archeological District	4	1. Condition of El Portal Archeological District
12. Regionally rare archeological features along the South Fork Merced River at archeological sites with rock ring features.	5	1. Condition of archeological sites
13. The Wawona Archeological District	5, 6, 7 and 8	1. Condition of Wawona Archeological District
14. The Wawona Covered Bridge	7	1. List of Classified Structures Condition Assessment

The characteristics of the Cultural ORV related to its condition are based on the same seven aspects of integrity that contribute to the National Register eligibility of each ORV element: location, design, setting, materials, workmanship, feeling, and association. *Location* is the place where the historic property was constructed or where the historic event occurred. *Design* is the combination of elements that create the form, plan, space, structure, and style of a property. *Setting* is the physical environment of a historic property. *Materials* are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. *Workmanship* is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. *Feeling* is a property's expression of the aesthetic or historic sense of a particular period of time. *Association* is the direct link between an important historic event or person and a historic property (NPS 1997d). Specific examples of the characteristics evidencing the integrity of the Cultural ORV include, but are not limited to:

***Archeological Site Integrity:*** Archeological sites reflect millennia of human use and cultural evolution in relation to the river. Prehistoric and historic resources in the Yosemite Valley and Wawona Archeological Districts include American Indian villages, camps, and special purpose sites dating from at least 6,000 years



ago to a period of historical occupation. In the El Portal Archeological District, some resources may be as old as 9,500 years. Benchmarks of integrity for archeological sites are primarily concerned with the *in situ* preservation of intact artifacts and features (the attributes of location, design, and setting discussed above), so that spatial associations between site components can be observed in surface and subsurface assemblages. The integrity of features—such as pictographs, rock rings, or rock alignments—are judged on the clarity with which the outlines of such features can be delineated. Additions of cultural elements not related to the site (e.g., modern campfire rings, trails, roads, graffiti, buildings, or structures) can negatively affect the integrity of an archeological site’s setting, association, and feeling. Historical remains can provide clear evidence of former use and association and may retain integrity as archeological resources, such as the physical remains of U.S. Army Calvary Camp A.E. Wood.

As a regular part of ongoing archeological research, inventory, and accountability, Yosemite utilizes the Archeological Site Management Information System (ASMIS). Throughout the NPS, ASMIS is the primary monitoring tool for the condition of archeological sites, documenting site conditions, threats, disturbances, treatments, and management actions, as well as providing descriptions and locations for all known archeological sites in the park (NPS 2005, 2007). The ASMIS condition assessment (“good,” “fair,” “poor,” “unknown,” or “destroyed”) addresses the stability of a site compared to the previous site visits, but is not an indicator of cumulative impacts over time (Middleton [NPS] 2008). The disturbance severity level at a site is determined through the combined assessment of individual disturbances (NPS 2010c). This component of the ASMIS data system is determined independently of site condition and reflects a cumulative impact level that the site has sustained (Darko 2011).

***Ethnographic Resource Integrity:*** Traditionally associated American Indians assign strong spiritual value to the Merced River and Yosemite Valley, continuing their sense of place and cultural association with the river that is both a destination and a place of refuge. American Indians attached names and stories to geologic and other features in the Merced River corridor and consider many of these to be sacred or of spiritual significance. Villages or campsites were sited along the river to take advantage of seasonal resources, riparian plant species, or migrations of game animals. The integrity of the association with the community’s cultural practices and beliefs is a critical consideration in assessing the condition of the ethnographic resources in Yosemite Valley. Benchmarks for the integrity of this component of the Cultural ORV in the Yosemite Valley segment could include unobstructed views of and/or access to sacred or significant geologic features, maintenance of and access to healthy populations of traditional ethnobotanical resources, and preservation and access to archeological remains or locations of historic, spiritual, or traditional significance.

***Built Environment Integrity:*** Conditional benchmarks for the integrity of the historic-era built environment include:

- continuity of original uses (association)
- maintenance of original physical form and materials (design, workmanship, and materials)
- a feeling of related association between the resource and contemporaneous elements (location, setting, feeling, and association)

## Cultural ORV—Yosemite Valley American Indian ethnographic resources

**ORV 8—Yosemite Valley American Indian ethnographic resources include a linked landscape of specifically mapped traditional-use plant populations, as well as the ongoing traditional cultural practices that reflect the intricate continuing relationship between indigenous peoples of the Yosemite region and the Merced River in Yosemite Valley.**

**Location:** Segment 2 (Yosemite Valley)

**Rationale:** Yosemite Valley Native American ethnographic resources include relatively contiguous and interrelated places that are inextricably and traditionally linked to the history, cultural identity, beliefs, and behaviors of contemporary and traditionally-associated American Indian groups. These areas include specifically mapped traditional plant gathering areas rooted in the history of traditionally associated peoples that are important to maintain and continue their cultural identity (Bibby 1994; Parker and King 1998). The traditional use plants gathered at such areas within Yosemite Valley comprise a complete system that is culturally significant. Both river-related and non-river related traditional use plants are included in this ORV.

**Management Objective:** Maintain ethnographic resources, and encourage future propagation to meet cultural restoration purposes to the extent ecologically feasible. Support access for traditional practitioners and other traditionally associated American Indians through the administrative elements of the user capacity and non-recreational tribal pass programs, and ongoing consultation with traditionally associated tribal groups to ensure the success of these programs.

### *ORV Condition at the Time of Designation (1987)*

The landscape of Yosemite Valley is a product of both natural and cultural processes. Many of the meadow and riparian species of this landscape are important ethnographic resources. While natural processes, such as those that drive hydrologic functions, have shaped the meadow complexes of the Merced River, cultural processes including American Indian burning to promote hunting and gathering have also shaped the Yosemite Valley landscape. Vista clearing to maintain views of the iconic scenery in Yosemite Valley also affected the condition of the landscape.

The discontinuation of traditionally associated American Indian practices such as seasonal burning, selective pruning, tilling, timely harvesting, and propagation were the primary impacts to ethnographic resources at the time of designation (Anderson 2005), triggered by a federal government policy of Indian removal. Clearing of vegetation for construction of facilities, homesteading, farming, and grazing of range animals occurred historically in traditionally used meadow and oak habitat (Bibby 1994). Effects on oak habitat may have been compounded by an overabundant deer population, leading to overbrowsing of oak seedlings and high mortality rates. The introduction of non-native plant species also encroached on populations of traditional use plants in Yosemite Valley at the time of designation. All of these changes have likely led to alterations in the abundance and integrity of ethnographic resources.

### *Current ORV Condition*

Many of the impacts to this ORV identified at the time of designation continue to the present, though the current NPS preservation mission encourages and seeks to facilitate ongoing cultural connections between traditionally associated American Indian communities and ancestral park lands and resources through the continuation of important cultural practices, religious ceremonies, and unimpeded access to sacred sites (Bibby 1994). Recognition of the ecological and ethnobotanical value of the open meadows found on the Valley floor has begun to result in restoration of some of these sensitive areas to conditions resembling those found in the period before intensive historic-era settlement (NPS 2010a). Several traditional use areas

have been identified within Yosemite Valley, and some of the plant species within them are now actively being managed to encourage healthy plant populations (Bibby 1994; Deur 2007).

Increasing visitation to Yosemite Valley since the time of designation has likely resulted in changes or impediments in access for traditional practitioners and other traditionally associated American Indians.

### ***Management Program for ORV 8***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. Three distinct indicators would be used to protect and enhance the values of the ethnographic ORV: a meadow fragmentation indicator, a riparian indicator, and a California black oak indicator. The meadow and riparian indicators overlap with indicators already described in this chapter under different ORVs. The California black oak indicator is introduced and described in this section. Although each indicator reflects different aspects of the ethnographic ORV and different potential impacts, they would be evaluated on a regular basis to ensure that the combination of these metrics protects the ethnographic ORV.

#### **Indicator 1 – Meadow fragmentation due to the proliferation of informal trails**

Some of the plant populations constituting this ORV occur in Yosemite Valley meadows. To monitor the condition of meadow ethnographic resources, the meadow fragmentation indication will be used, as described under biological ORV 1 – Meadow Fragmentation due to the Proliferation of Informal Trails. The management standards, definitions of adverse effect and degradation, monitoring program, and trigger points are the same as described under ORV 1.

#### **Indicator 2 – Status of Riparian Habitat**

Other plant populations constituting this ORV occur in Yosemite Valley riparian areas. To monitor these riparian ethnographic resources, the Status of Riparian Habitat indicator will be used, as described under biological ORV 2 – Status of Riparian Habitat. The management standards, definitions of adverse effect and degradation, monitoring program, and trigger points are the same as described under ORV 2.

#### **Indicator 3 – California Black Oak**

California black oak acorn has been an important staple food for American Indians in Yosemite Valley for millennia (Anderson 1991; Hull and Moratto 1999). According to Bibby (1994:17), its historic importance is likely one reason why acorn, and the cultural knowledge regarding its preparation, has survived strongly among the contemporary associated tribes and groups. Although black oak acorn is no longer a staple food, it has become symbolic of ancestral traditions and an important aspect of contemporary culture. For example, acorn soup is prepared for special occasions, especially traditional gatherings and ceremonial events. Several of the former inhabitants of the last American Indian village in Yosemite Valley recall gathering acorn with their parents and/or grandparents, attesting to the multi-generational historical and place-based personal connections between black oaks and the people. Certain groups of trees, or even individual trees, continue to be associated with particular individuals who gathered in historic times (Bibby 1994:22).

The current structure of the California black oak population in Yosemite Valley follows a familiar pattern for many oak species throughout California – a frequency distribution with a peak frequency in the medium

adult size class but few, if any, saplings and young adults. For one or more reasons, survivorship from the seedling stage into the larger sapling and young adult stages is very low for many oak species. This apparent lack of regeneration (also known as recruitment) is a widespread pattern in California (Holzman, 1993; Swieki et al., 1993), the United States (Loftis & McGee, 1992; Russell & Fowler, 1999), and other parts of the world (Watt, 1919; Shaw, 1968; Saxena & Singh, 1984; Singh et al., 1997; Abrams et al., 1999). Many factors have been proposed to account for the poor regeneration or lack of survivorship from seedling to sapling, leading to the absence of saplings and young adults (Tyler et al., 2006). Little data exists on the structure of black oak populations throughout its distribution in California and Oregon (Tyler et al., 2006), but some recent data from Yosemite Valley (Angress, 1985; Kuhn & Johnson, 2008; Ripple & Beschta, 2008) and anecdotal accounts indicate the black oak population structure also resembles those of others where regeneration is lacking or very low.

Although black oaks may be an exception, a typical size class frequency distribution for a tree species is one called the reverse-J curve where the smallest size classes (i.e. seedlings and saplings) have the most individual trees, each larger size class (i.e. saplings, adults) has fewer individual trees, and the largest size class (i.e. adults) has the fewest number of trees (Harper, 1977). This demographic structure is caused by density-dependent competition for limited resources such as light, water, and nutrients, and predation. In the early life stages (i.e. smaller size classes), mortality rates are high, with a small proportion of a size class surviving into the next, larger size class. Mortality rates decrease as individuals get older. Once a tree becomes large enough, mortality rates decline considerably and most then live to an old age.

A leading hypothesis to explain the commonly found lack of regeneration in oaks and other species in protected areas is that an overabundant ungulate (deer or elk) population is overbrowsing the seedlings, leading to high mortality rates. This hypothesis is supported by considerable research and observations from Yosemite (Dixon, 1944; Gibbens & Heady, 1964; Heady & Zinke, 1978; Kuhn & Johnson, 2008; Ripple & Beschta, 2008), California (Kuhn, 2010), other parks (Wolf & Cowling, 1981; Hebblewhite et al. 2005; Bestcha, 2005; Ripple & Bestcha, 2006), and the United States (Stromayer & Warren, 1997; Waller & Alverson, 1997). Cote et al. (2004) offer an excellent literature review on the impacts of overabundant deer populations on many forest tree species. It has long been known and documented that protected areas such as national parks contain an overabundance of ungulate species such as deer and elk (Cahalane, 1941; Leopold et al., 1963; Porter & Underwood, 1999).

This indicator has two components that monitor the status and long-term health of adults in two key stands of black oaks in Yosemite Valley (the Schoolyard and El Capitan stands). Status is monitored by tracking the number of adults over time, and long-term health is monitored by measuring saplings and non-saplings (i.e. adults) and calculating the ratio of saplings to non-saplings. Together, these two components provide a quick but informative look at the status and long-term health of the stands.

For the first component, it is important that the number of adults remain within an acceptable range. The number of adults should stay relatively steady in order to maintain the quality and character of the woodlands, as well as to reproduce and create new individuals. Although uncertain and variable, California black oaks likely become reproductive adults when they reach a size of between 10 and 20 cm diameter at breast height (dbh). Although many individuals in the “sapling” stage (<20 cm dbh) produce acorns and are technically adults, adults are defined as individuals > 20 cm dbh. The number of adults has likely been fairly stable over the recent past, though there continues to be slow punctuated adult mortality. The number of adults should not experience a further significant decline.

For the long-term health of the two stands, there should be adequate recruitment into the critical sapling stage. Between 1.3 meters (the height at which dbh measurements can be taken) and 2.0 meters in height, saplings are able to escape deer browsing and survival rates are much higher than for earlier stages of growth. Thus, saplings are defined as individuals > 1.3 meters tall and < 20 cm dbh. Based on the assumption that California black oak follows an expected demographic frequency distribution (based on the common reverse-J curve model), there should be many more saplings than the number of adults in the largest size classes.

The proposed management standards are based on the assumption that a healthy black oak population size structure should follow the common reverse-J curve model. However, it is possible that black oaks and even oaks in general have highly episodic recruitment. This would create a population size structure frequency distribution with multiple peaks and troughs. Existing data indicate that there has not been strong episodic recruitment in at least the last 90 years. While recruitment may still be episodic, it is unlikely that episodes occur on time scales of 90 years or longer. Given the current size structure of the Yosemite Valley black oak population and the extensive research on the effects of ungulates on oak and other tree population demographics, it is likely that the pattern of very low recruitment in the last 90 years is not a naturally occurring pattern.

### ***Management Standard***

There are two components to the management standard for two key stands of black oaks in Yosemite Valley (the Schoolyard and El Capitan stands): 1) the number of adults; and 2) the ratio of saplings to non-saplings for all black oaks taller than 1.3 meters. For adult oaks, the proposed management standard is at least 85% of adult oaks, when compared to the 2008 baseline. For the ratio of saplings to non-saplings, the proposed management standard is a ratio greater than 0.5. The expected size class frequency distribution based on data collected by Kuhn & Johnson (2008) is a ratio of saplings to non-saplings of 0.65. Since the management standard applies to the entire segment, the management standard considers the total number of adults and the ratio in the two stands; however, the trigger points described below apply to the individual stands, since trigger points are designed to maintain conditions above the management standard.

### ***Adverse Effect***

An adverse effect would be the number of adult California black oaks (i.e. > 20 cm dbh) declining by at least 20% compared to the 2008 baseline.

### ***Degradation Standard***

Degradation would be the number of adult California oaks (i.e. >20 cm dbh) declining by at least 25% compared to the 2008 baseline.

### ***Monitoring - California Black Oak***

California black oak is a slow growing species, and adult mortality rates are also low (though quite variable year to year), thus monitoring can be conducted on long time scales. The two key stands of black oaks in Yosemite Valley (the Schoolyard and El Capitan stands) would be monitored every five years.

The first trigger point would be a decline in the total number of adult oaks of 15% in either stand compared to 2008 baseline, or a decline in the sapling-to-non-sapling ratio to 0.55 or less (Table 5-19). Management actions to respond to trigger points would be active restoration, including deer and rodent exclusion for

individual seedlings, saplings, parts of the stand, or all of the stand; planting acorns or seedlings; and possibly a reduction in visitor use. Deer protection can be applied to naturally recruited seedlings, and protection from deer and rodents can be applied to planted acorns or seedlings. Methods to protect planted acorns and seedlings have been used successfully in other restoration projects (Swiecki & Bernhardt 1991; Tyler et al. 2008) and can be applied in Yosemite.

**TABLE 5-19: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR YOSEMITE VALLEY AMERICAN INDIAN ETHNOGRAPHIC RESOURCES (CALIFORNIA BLACK OAK)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> In either stand, total numbers of adults decline by 10% OR the ratio of saplings to non-saplings falls below 0.55.	Protect existing adults (particularly if the adult trigger is tripped) Protect existing saplings (particularly if the ratio trigger is tripped) Ecological restoration, primarily through planning of seedlings, possibly over a number of years Protect individuals of all age and size classes through fencing, removal of competing plants, fuel reduction, fencing, public awareness, signs, removal of facilities. Reduce deer browsing Reduce rodent pressure Reduce public use	0.65 is the expected ratio, notwithstanding natural variability, and management action when the ratio reaches 0.55 allows for a declining trend to be reversed before the management standard is reached. Similarly, management action when adult decline reaches 10% allows for a declining trend to be reversed before the management standard is reached.

During ecological restoration, the success of management actions will be monitored annually to determine the success and further actions taken to mitigate any failures. Young saplings will require protection from deer until they are tall enough to escape heavy browsing. Mortality rates of all seedlings and saplings will be monitored annually to ensure sufficient survival rates into larger size classes. Periodically (every 3-10 years), the current population structure can be compared to an expected frequency distribution based on data collected by Kuhn & Johnson (2008) to determine relative success of the restoration actions. Saplings and young adults will continue to experience some mortality as they grow larger. Depending on conditions, it will take approximately 55 - 85 years (mean of 69 years) (Kuhn & Johnson, 2008; Ripple & Bestcha, 2008) for California black oak to grow into the adult size classes (> 20 cm dbh) in Yosemite Valley.

### ***Management Concerns and Protective Actions***

Management concerns arise when a trigger point is exceeded, indicating a river value does not meet management standards. Recent California black oak data from Yosemite Valley (Angress, 1985; Kuhn & Johnson, 2008; Ripple & Beschta, 2008) indicate that the sapling to non-sapling ratio is less than 0.55, requiring immediate ecological restoration to increase the number of saplings.

### ***Management Considerations and Enhancement Actions***

Management considerations related to ethnographic resources involve park operations, crowding, and visitor use.

Park operations have triggered changes in ethnographic resources by disturbing traditional use plant populations or changing access to these places. The *Merced River Plan/DEIS* would address these considerations through the following actions:

- Best management practices would ensure for the continuation of coordination between traditionally associated American Indian tribes, groups, and traditional practitioners (through the Park American Indian Liaison) with law enforcement, fire management, interpretation, invasive species, ecological restoration, and facilities management programs
- Best management practices would include operational guidelines for material staging areas, parking, etc. to protect ethnographic resources
- Crowding and high visitor use in Yosemite Valley during peak season can impact the ability of traditionally associated American Indians to access traditional use areas for various traditional cultural practices. The *Merced River Plan/DEIS* would address these considerations through the following actions: Under Alternatives 2-6, the visitor use management program would ensure access for traditionally associated American Indians for participation in annually scheduled traditional cultural events. In addition, tribal access for the personal conduct of traditional cultural practice would be assured through the Yosemite tribal fee waiver pass program.
- Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages. Work would build upon other focused mapping and condition assessment for traditional use plants and archeological sites proposed as part of a detailed assessment of the ethnographic component of the Cultural ORV in Segment 2. Work would happen in close collaboration with park-associated Indian tribes and groups, using staff expertise in cultural anthropology, botany, archeology and oral history. Methods would include compiling existing information gathered during previous ethnographic studies, filling gaps in the historical record through research in archival repositories, updating and expanding the oral history documentation, and complete detailed field mapping. Resulting information would be synthesized into a National Register nomination and interpretive summary for the Yosemite Valley Traditional Cultural Property.

Threats to traditionally used plant populations include invasive species such as Himalayan Blackberry (*Rubus armeniacus*), drainage and hydrology impacts to meadows, and erosion and revegetations that affect riparian vegetation. The *Merced River Plan/DEIS* would address these considerations through the following actions:

- The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program would address impacts to some traditionally used plant populations in some locations.
- Restoration actions to protect riparian areas, meadows, and hydrological resources would further contribute to the protection and enhancement of the traditional use plant communities included in this ORV.

### ***Conclusion: Protecting and Enhancing ORV 8 (ethnographic resources in Yosemite Valley)***

The ethnographic component of the cultural ORV is determined to be absent of adverse effects and degradation. Management concerns and considerations are present, as a trigger point for the ratio of sapling to adult trees is exceeded. As a response, the NPS will introduce new seedlings in to the affected stands and protect as necessary to ensure high survival rates, with a goal to establish enough saplings so the ratio of saplings to all adults is at least 0.65. To address the management considerations, the *Merced River Plan/DEIS* proposes a variety of actions including continued coordination between traditionally associated American Indian tribes, groups, and traditional practitioners and the NPS; continued access for traditionally associated American Indians for participation in annually scheduled traditional cultural events; and

ecological restoration actions to protect and enhance traditionally used plant populations. To prevent future impacts, the NPS will monitor the condition of the ORV and take specific actions should additional trigger points be exceeded. Trigger points are selected to inform managers well in advance of this ORV's conditions falling to the level of the management standard.

## Cultural ORV—Yosemite Valley Archeological District

**ORV 9—The Yosemite Valley Archeological District is a linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River.**

**Location:** Segment 2 (Yosemite Valley)

**Rationale:** Drawn by the year-round availability of water and the diversity of plants available for sustenance in Yosemite Valley, people have inhabited the valley for thousands of years, leaving behind an exemplary collection of archeological sites in the Yosemite Valley Archeological District. Many pre-contact and historic-era archeological sites are identified in ethnographic literature and native oral traditions, providing a rare example of the long and continuing association of people and places. While the landscape itself provides exemplary documentation of land use practices, many of the individual sites contain exceptional information with the potential to interpret not only ancient lifeways, but also cultural change at the period of contact with Euro-Americans. In addition to this regional and State-wide scientific and interpretive value, the sites have value to American Indian tribes and groups as a connection to their ancestors and an important component of their cultural patrimony. Because the archeological sites within the Yosemite Valley Archeological District comprise a complete system that is culturally and scientifically significant, both river-related and non-river related archeological sites are included in this ORV. Furthermore, archeological sites contained within this district but existing outside of the river corridor boundaries contribute to the significance and integrity of the historic property and are therefore included in this ORV.

**Management Objective:** Ensure protection and enhancement of the Yosemite Valley Archeological District as a whole, and ensure that human impacts are not adversely affecting the district's essential character and integrity.

### *ORV Condition at the Time of Designation (1987)*

The archeological district nomination completed in 1979 indicates that archeological resources retained integrity despite administrative and facility-related impacts, visitor use-related impacts, and ecological process-related impacts. At the time of designation, the following impacts had been documented to sites within the Yosemite Valley Archeological District:

- Construction of historic and contemporary facilities such as roads, trails, buildings, and utilities.
- Unauthorized excavation at one site - damage assessment determined that the site still contained intact subsurface deposits (Mundy and Hull 1988).
- Informal trails
- Intentional or inadvertent movement of artifacts or feature elements (such as displacement of rock alignments)
- Soil compaction
- Bouldering/rock-climbing and camping impacts that included ground-disturbing actions
- Tree falls
- Bioturbation - The disturbance of soil by living things (e.g., rodent tunneling).
- Erosion
- Rock fall



### ***Current ORV Condition***

The same types of impacts that were occurring at the time of designation continue to affect current site conditions. While the majority of archeological sites in Yosemite Valley retain a relatively high degree of integrity, many have been disturbed by human activity and natural processes (Hull and Kelly 1995). The majority (47% or 56 sites) of Yosemite Valley Archeological District sites within the Merced River corridor are rated in “good” condition according to their most recent assessment scores (ASMIS). An additional 33% (39 sites) are in fair condition, and 18% (22 sites) are in poor condition. The corresponding disturbance severity levels for the visited sites show that 39% of the sites (47 sites) have low disturbance severity, with an additional 33% (39 sites) showing moderate disturbance severity, and 25% (29 sites) displaying severe disturbances (Darko 2011). Impacts may include soil compaction, vegetation damage, movement of artifacts, feature disturbance, and vandalism. Impact severity ranges from minor to severe, although most visitor-use impacts were characterized as minor or moderate. Seven sites were identified during recent visits as having experienced a moderate to severe degree of impact from visitor use (Middleton [NPS] 2009, 2010). One of the sites within the River corridor could not be relocated during a recent attempted field assessment (Darko 2011). The same types of impacts that were occurring at the time of designation continue to affect site conditions now.

### ***Management Program for ORV 9***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program.

#### **Indicator – Condition of Yosemite Valley Archeological District**

The Yosemite Valley Archeological District is listed on the National Register of Historic Places (NPS 1978). The National Register of Historic Places (NRHP) defines an archeological district as “. . . a grouping of sites, buildings, structures, or objects that are linked historically by function, theme, or physical development or aesthetically by plan” (NRHP). Within the Yosemite Valley Archeological District, individual prehistoric sites form the collective character and significance of the district. Sites discovered after nomination would be evaluated and may be added to the district.

The NPS selected ‘archeological site condition’ as an indicator for this ORV. The indicator is the aggregate condition of the collection of archeological sites within the district. Site condition includes the general physical state of the site and associated material remains. Other key components of site condition are site stability, the potential for physical deterioration over time; and site integrity, the potential to convey information, setting, feeling, and association of previous historical eras to researchers, the public, and traditionally associated peoples.

Since 2007, the Archeology Visitor Use Program has annually monitored the range of visitor impacts and changes in site condition at a sample of archeological sites within the Tuolumne and Merced Wild and Scenic River corridors. Program methodology was originally modeled after similar archeology programs at NPS Flagstaff Area Monuments (Donnermeyer 2005; Gossart 2005) and Grand Canyon National Park (Dierker and Leap 2005, 2006), with subsequent modifications specific to Yosemite site types and visitation patterns (Middleton 2009:1). Project protocols were designed to fit within the larger Yosemite Visitor Use and Impact Monitoring Program framework and reporting standards (see NPS 2008a, 2008b, 2009a, 2009b).

The site monitoring protocol uses the NPS Archeological Sites Management Information System (ASMIS) format (NPS 2007a, 2007b), supplemented with data collection specific to human impacts. ASMIS, a management database developed by the NPS, tracks a broad range of information about documented archeological sites: site components, disturbances, current condition, cumulative disturbance effects, and management actions. ASMIS functions as a “tool to support improved archeological resources preservation, protection, planning, and decision-making by parks, regional offices, and the national program offices” (NPS 2007b). Archeological site condition has been assessed in Yosemite for several decades, but prior data collection does not always meet current professional standards. The visitor use protocol was designed to assess site condition and impacts using a systematic, consistent methodology.

ASMIS quantifies impacts (disturbances) in two ways: the effect on site condition and site damage severity levels. Condition effects are ranked on an ascending scale: negligible, partial loss repairable, partial loss irretrievable and total loss irretrievable. Impacts with negligible effects can cause minor damage to the physical condition of the site, with little to no loss of data potential or site integrity. Partial loss repairable effects result in minor damage to the site that can be reversed or ameliorated through treatment or repair, such as careful removal of campfire rings or hand removal of fire fuel buildup. Partial loss irretrievable effects result in more serious damages that are not repairable, such as the partial collapse of a prehistoric rock feature from human alteration, or artifact movement from original context. Total loss irretrievable effects result in complete loss of the resource, as in site destruction from fire or vandalism (NPS 2007a).

Site damage from a disturbance is measured as low, moderate, or severe, based on areal extent or the amount of site integrity compromised (NPS 2007a; Bane 2011). These measurements take into consideration site type, data potential, and impact to site integrity. Destruction of a pictograph, for example, is highly damaging to site data potential even if the pictograph represents only a small physical area of site. Loss of the densest portion of a lithic scatter may be small in areal extent, but critically large for research potential if temporally diagnostic tools had been present in that locus. Previous data recovery at the site may mean some impacts are less damaging for data potential/integrity at the excavated locations.

The Archeology Visitor Use Program augments ASMIS data collection on each site disturbance with an assignment of disturbance causation: natural, park operations, visitor, or unknown. Both park operation and visitor disturbances are included in total site counts of human impacts. Potential park operation disturbances include road construction and maintenance, trail construction and use, utilities installation, building construction, controlled fire, ecological restoration, or scientific research. Unlike natural and visitor impacts, many park operation impacts in the last two decades are considered “undertakings”, and are addressed through treatment measures implemented before or during disturbance. The most common types of visitor disturbances include camping impacts, informal trails, climbing, and use by hikers and/or horses. Other less common visitor disturbances include damage to vegetation, damage to archeological ruins, stock use (picketing or corralling), soil compaction, dumping, off-road vehicle use, vandalism, and unauthorized collection of artifacts (looting).

### ***Management Standard***

For the Yosemite Valley Archeological District, the management standard is at least 80% of sites free from current serious human impacts that have not otherwise been addressed through treatment measures noted above for sites with low data potential, and at least 85% for sites with high data potential. Serious human impacts are single disturbances with partial or total loss irretrievable disturbance effects at moderate to severe site damage levels, or a series of three or more disturbances with partial or total loss - irretrievable

disturbance effects at low site damage levels. Unmitigated impacts are disturbances that have not been addressed through treatment measures noted above.

Current site conditions and human impact values for a sample of relevant Yosemite Valley Archeological District sites are shown below (Table 5-20). Results are drawn from Archeology Visitor Use site monitoring, 2007-2011, for a sample set of 60 sites (53%) from a total of 113 Yosemite Valley District sites relevant to the Merced River corridor ORV. Over a five year interval (2007-2011), 95% of high data potential sites and 93% of low data potential sites in the sample were considered free of serious human impacts, meeting the target management standards for the indicator.

**TABLE 5-20: PERCENTAGE OF YOSEMITE VALLEY ARCHEOLOGICAL SITES FREE OF CURRENT SERIOUS UNMITIGATED IMPACTS<sup>a</sup> IN A MONITORED SAMPLE SET (N=60)**

High data	Low data
95%	93%
<sup>a</sup> Note: Impacts with partial loss irretrievable effects with moderate to severe damage levels or multiple (≥3) impacts with low damage levels.	

In balancing visitor use and site preservation, some disturbances to resources can be acceptable if the site retains context and integrity (Fairley and Downum 2000). For archeological sites with estimated low data potential (i.e. small sites with few materials and no diagnostic artifacts, sites with a single feature such as a bedrock mortar, sparse lithic scatters, or heavily deteriorated sites), some amount of irretrievable damage may be allowable. This is particularly true for common site types in the district, such as small lithic scatters. The Management Standard allowance for numbers of low data sites with human impacts (20%, or 80% of sites free of serious unmitigated human impacts) represents a realistic management threshold for protection of the largest portion of sites (Donnermeyer 2005:33).

For sites with estimated high data potential (i.e. sites with multiple features, sites with diagnostic artifacts or dense artifact concentrations, documented historical sites, or sites with uncommon or unique attributes), the potential resource loss is greater, as is the impact to the district. A serious human impact or series of minor impacts resulting in irretrievable damage and loss at high data sites is less acceptable (Donnermeyer 2005). The Management Standard allowance for numbers of high data sites with human impacts for these effects (15%, or 85% of sites free of serious unmitigated human impacts) is therefore less.

### *Adverse Effect*

An adverse effect, as defined in this context under WSR, occurs when the number of sites free from current serious unmitigated human impacts falls to 60% for sites with low data potential, and 70% for sites with high data potential in a ten year monitoring interval.

The adverse effect represents a higher level of serious impact for both low and high data potential sites over a ten year interval of representative site sampling within the district. The 20% increase serves as a warning of long term downward trends in site condition, requiring stronger protective management actions before widespread individual site damages threaten the essential character of the aggregate archeological district (Donnermeyer 2005:33).

### *Degradation Standard*

The ORV would be considered degraded should the archeological district be impacted to the extent that it is no longer eligible for listing in the National Register of Historic Places. This would occur if the district no longer meets the criteria for listing in the NRHP through deterioration and loss of integrity, of the “qualities which caused it to be originally listed have been lost or destroyed” (NPS 1997; 2004). A “degraded cultural resource” would typically no longer have status as a historic property, and its National Register status could not be restored through mitigation efforts, however would continue to exist as tangible cultural remains.<sup>29</sup>

### *Monitoring – Condition of Yosemite Valley Archeological District*

Site condition assessments would be conducted for a representative sample of archeological sites within the district at 5-15 year monitoring intervals, following the assigned assessment (ASMIS) site inspection schedule (NPS 2007:66). The key source of feedback for adaptive archeological site management is the periodic, systematic analysis of collected site data, focused on management objectives (Kintigh et al. 2007). To achieve this feedback and assess trigger points for management actions, summary reporting of site monitoring results for the district would be compiled at five-year intervals to determine maintenance of the management standard. This five year interval for summary reporting and analysis of site data is the minimum reporting period necessary for accurate capture of human impacts over longer time spans (Bane 2011).

District re-evaluations would be completed at minimum of 25-year intervals to verify that the district has not been degraded. Table 5-21 lists triggers and specific management responses that would take place.

**TABLE 5-21: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR THE YOSEMITE VALLEY ARCHEOLOGICAL DISTRICT (CONDITION OF DISTRICT)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
The number of individual sites free from serious unmitigated human impacts falls to 90% or less for sites with low data potential, and falls to 95% or less for sites with high data potential in a monitoring interval.	<ol style="list-style-type: none"> <li>1. Increased monitoring frequency for affected sites.</li> <li>2. Increased management protection designed to counteract or minimize impacts, crafted to individual site specifications. Examples include: <ul style="list-style-type: none"> <li>• Site documentation, research, testing, or NRHP evaluation;</li> <li>• Site stabilization, re-vegetation, trail reroutes, trail removal;</li> <li>• Increased public interpretation and education;</li> <li>• Increased education for local user communities such as residents or climbers;</li> <li>• NRHP re-evaluations and/or data recovery at affected sites;</li> <li>• Development of comprehensive site management plans for large, complex sites in developed areas.</li> <li>• Initiate hard closures of individual affected sites, utilizing increased visitor education about human impacts and the necessity for closures. Site closure regulations would be represented within the superintendent’s compendium in order to allow legal enforcement.</li> </ul> </li> <li>3. At the district-wide level, NRHP nomination amendments to reflect changes in district integrity.</li> </ol>	The trigger range is set at 10% above standard violation, allowing identification of individual problem sites and localized areas and timely prescriptive actions before management standard levels are violated. The trigger range was selected from sampling results for five years of site impact monitoring within the district, and is based on best professional judgment of thresholds necessary to retain desired management standard.

<sup>29</sup> Because this ORV is defined by archeological districts, where the archeological ORV in the Tuolumne River Plan/DEIS is defined corridor-wide, the Merced River Plan/DEIS uses loss of eligibility as degradation. A more precise definition is needed in the Tuolumne River Plan/DEIS because that ORV includes several districts.

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-21 below. There are currently no management concerns associated with the Yosemite Valley Archeological District.

### ***Management Considerations and Enhancement Actions***

The following site-specific management considerations occur in Yosemite Valley:

- Stock trail through sensitive midden deposit and formal hiking trail near a rock art feature impact sensitive cultural resources on archeological site CA-MRP-0046/47/74. Modern graffiti desecrates the rock art boulder.
- Stock use and operational staging cause impacts to archeological resources at site CA-MRP-0052/H.
- Exceptional site located at the modern-day Yosemite Village encompasses key characteristics of the Archeological District. The location of this site has many complex uses which may impact its integrity; however, the archeological site record has not been comprehensively updated in almost two decades.
- Heavily used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling cause impacts to the prehistoric rock shelter and associated artifacts at archeological site CA-MRP-0057.
- Parking, rock climbing, camping, vandalism, human waste, fire rings and informal trails are impacting a prehistoric rock shelter and associated artifacts at site CA-MRP-0062.
- Camping, trampling, and trash are causing impacts to bedrock mortars (pounding rocks) at site CA-MRP-0080. Impacts to these important archeological features affects continuing use and association with these culturally significant resources.
- Rock climbing activities (“bolt ladder”) at a rock shelter boulder cause trampling of the near surface archeological deposit at CA-MRP-0082/H.
- Rock climbing (bouldering) activities on a rock art boulder and informal trails impact the archeological and ethnographic resources at CA-MRP-0158/309.
- Vehicular and bike traffic along a dirt access road affects surface and subsurface archeological resources at CA-MRP-0190/0191.
- Non-technical climbing on a large bedrock mortar (pounding rock) causes impacts to the archeological resource at site CA-MRP-0240/0303/H. This type of visitor use on the bedrock mortar affects continuing use and association with these culturally significant resources.

Archeological resource protection would be achieved through actions in this plan to manage visitor use levels, using natural features to conceal and divert foot traffic around sites, removing informal trails, and formalizing river and meadow access locations, mitigating ecological restoration practices by using noninvasive techniques wherever possible. Many of the actions related to ecological restoration in Segment 2, such as delineating roadside parking, would also help protect archeological sites by diverting foot traffic away from sites and into less sensitive areas.

Site-specific treatment actions would be developed through site management plans, where necessary, to avoid resource loss through park actions (such as development, repair, and maintenance of facilities and underground utilities to support visitor use or natural forces).

Management considerations for this ORV also involve continuing survey and documentation needs. The national register nominations for all three archeological districts require updating to include additional inventory, discussion of archeological studies conducted in the past 30-plus years, refinement of research issues, a list of which sites are contributing elements, a more inclusive approach to the National Register criteria, and development of a more comprehensive approach to management of the district. Although Darko (2011) made substantial progress in bringing site documentation up to current standards for the resources in the corridor, additional work remains for all three of the districts, which the NPS will continue to do.

### ***Conclusion: Protecting and Enhancing ORV 9 (Yosemite Valley Archeological District)***

The Yosemite Valley Archeological District is absent of adverse effects, degradation, and management concerns (conditions that exceed management triggers, for example). Management considerations are present. To remedy management considerations, the Merced River Plan/DEIS proposes a variety of actions to address specific considerations in Alternatives 2-6 including removal of informal trails, non-essential roads, and infrastructure that are either causing ongoing impacts to archeological sites or facilitating visitor use that is in turn causing ongoing impacts. The NPS would also delineate bike paths, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; remove graffiti at rock art and other sensitive features, conduct public education to discourage climbing, and remove climbing hardware from sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points. Trigger points are selected to inform managers well in advance of adverse effects or degradation impacts.

## **Cultural ORV—Yosemite Valley Historic Resources**

**ORV 10—The Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system.**

**Location:** Segment 2 (Yosemite Valley)

**Rationale:** Yosemite Valley is an intact and always controversial experiment between people and place, one that began in the mid-19<sup>th</sup> century within a few years of the arrival of non-native settlers intent on preserving a “natural” landscape through its development and management as a public park. The Yosemite Valley Historic Resources ORV, and the complex Yosemite Valley Historic District cultural landscape it sits within, is the direct result of this profoundly significant experiment. The Yosemite Valley Historic Resources ORV reflects the remarkable historical values of the Merced River, and is tangible evidence of the dynamic relationship between people and place as preserved in the nationally significant Yosemite Valley Historic District.<sup>1</sup> Together, the river corridor, its attendant resources, and the Yosemite Valley Historic District form the cultural landscape of the Yosemite Valley Historic Resources ORV.<sup>2</sup> The Yosemite Valley Historic Resources ORV thus represents a collection of river-related or river dependent, rare, unique or exemplary<sup>23</sup> buildings and structures. These include The Ahwahnee and the LeConte Memorial Lodge (the National Historic Landmarks within the river corridor) and other important buildings and structures noteworthy for their historic, architectural, engineering, or aesthetic values.<sup>4</sup> Many of the valley’s historic bridges, such as Stoneman, Ahwahnee, Sugar Pine, Yosemite Creek, Tenaya Creek, Clarks, and Happy Isles bridges, represent the first series of bridges built by the Bureau of Public Roads specifically for the National Park Service.<sup>5</sup> The following individual elements comprise the collective Yosemite Valley Historic Resources ORV:

- The Ahwahnee (NHL)
- The LeConte Memorial Lodge (NHL)
- Yosemite Valley Chapel
- Vernal Fall Comfort Station
- Nature Center at Happy Isles (Fish Hatchery)
- Sugar Pine Bridge
- Clark’s Bridge
- New Happy Isles Bridge
- Tenaya Creek Bridge
- Yosemite Creek Bridge

- Residence 1 (Superintendent's House)
- Ahwahnee Bridge
- Pohono Bridge
- Stoneman Bridge
- El Capitan Bridge
- 3 Bridalveil Fall Trail bridges
- Mist Trail

The ORV is the collective or collection of these character defining elements, which together make up the Yosemite Valley Historic Resources ORV; no single element defines the ORV. The Yosemite Valley Historic Resources ORV is embedded within the larger natural and cultural systems of Yosemite Valley, and therefore represents the river-related or river-dependent elements of the Yosemite Valley Historic District and its landscape characteristics.<sup>6</sup>

**Buildings and Structures:** The buildings and structures included in the collective are those that lie within the river's corridor and are related to the river through design, siting or function. They continue to support ongoing human use of the river, and represent development spanning the years between the mid-19<sup>th</sup> and mid-20<sup>th</sup> centuries related to Euro-American settlement, Army administration, and important stages in development of the National Park Service Rustic Architectural style, chronicling the evolving definition of what is considered "appropriate" park architecture in a prized natural setting.

**Circulation:** The bridges included in the collective support the looping patterns of circulation north and south, east and west across the Merced River and its tributaries in Yosemite Valley

**Spatial Organization:** The design, composition, and sequencing of outdoor spaces in Yosemite Valley is reflected in the patterning of historic development

**Management Objective:** The Yosemite Valley Historic Resources ORV will be managed to ensure protection and enhancement of this historic development system and its setting. Protection and enhancement entails ensuring that human activities do not adversely affect (per WSRA) the collective ORV or the landscape characteristics of the Yosemite Valley Historic District, within the river corridor, described above. While individual elements of the collective ORV may be lost, the collective of elements will continue to represent the important historic patterns of development in Yosemite Valley, and reflect the important landscape characteristics of the Yosemite Valley Historic District.<sup>7</sup>

<sup>1</sup> The Yosemite Valley Historic District is a historic property listed in the National Register of Historic Places. The district is comprised of 929 contributing resources: 302 buildings, 16 sites, and 611 structures. Significant character-defining features of this district include its spatial organization, historic land uses, and architecture. The district is nationally significant under Criterion A for its association with the history of natural resource conservation and western expansion and exploration. It is also nationally significant under Criterion C for its nationally significant architecture represented by three National Historic Landmarks, and historic developed areas (Yosemite Village and Camp Curry). The nomination can be accessed online at <http://www.nps.gov/yose/historyculture/upload/Yosemite-Valley-Historic-District.pdf>.

<sup>2</sup> The Yosemite Valley cultural landscape is described in the National Register of Historic Places Nomination for the Yosemite Valley Historic District. The landscape characteristics of natural systems and features, spatial organization, vegetation, circulation, land use, and views and vistas contribute to the historically significant character of the Yosemite Valley Historic District; however, they are not counted as contributing resources in the nomination.

<sup>3</sup> These terms reference Wild and Scenic Rivers Act criteria for an outstandingly remarkable value (ORV).

<sup>4</sup> These values are defined as the criteria for inclusion in the National Register of Historic Places: The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history.

<sup>5</sup> These were designed and constructed as models for bridges in national parks, with review by the Commission of Fine Arts, personal involvement from Stephen Mather and Horace Albright, and careful consideration for their architectural authenticity. Previously (and incorrectly) documented as reinforced concrete with stone veneer (see the 1977 National Register Nomination for the Yosemite Valley Bridges), they were instead constructed using authentic arched stone vaults. They are significant for their engineering, their architecture, and their aesthetics -- as intrinsically beautiful structures, as important vantage points for viewing the river, and as scenic features in a sublime natural setting. (National Park Service: "Historic American Engineering Record: Written Historical and Descriptive Data, Yosemite National Park Roads and Bridges, Yosemite National Park, Mariposa County, California [HAER No. CA-117]." USDI National Park Service, Washington D.C., 1991).

<sup>6</sup> The term landscape characteristics is defined in the National Register Bulletin: Guidelines for Evaluating and Documenting Rural Historic Landscapes, available online at <http://www.nps.gov/history/nr/publications/>. According to the bulletin, "landscape characteristics are the tangible evidence of the activities and habits of the people who occupied, developed, used, and shaped the lands to serve human needs; they may reflect the beliefs, attitudes, traditions, and values of these peoples." The characteristics include both processes influential in shaping the land, and physical components that are evident on the land: Land Uses and Activities; Patterns of Spatial Organization; Response to the Natural Environment; Cultural Traditions; Circulation Networks; Boundary Demarcations; Vegetation Related to Land Use; Buildings, Structures, and Objects; Clusters; Archeological Sites; and, Small-scale elements.

<sup>7</sup> The concept of "integrity" used here is defined in relation to the National Register of Historic Places as "the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's prehistoric or historic period. Historic integrity is the composite of seven qualities: location, design, setting, materials, workmanship, feeling, and association."

### ***ORV Condition at the Time of Designation (1987)***

The landscape of Yosemite Valley is a continually evolving natural and cultural system that has changed in response to successive American Indian, private, state and federal government management strategies, increasing visitation, and incremental loss of historic features and land uses. At the time of designation (1987), the individual elements of the Yosemite Valley Historic Resources ORV were in essentially the same physical condition and largely served the same function as they did historically. The primary impacts to the Yosemite Valley Historic Resources ORV at the time of designation were incremental changes in the historic setting, such as evolution of the circulation system (e.g., converting the eastern part of the system to shuttle-only, adding bicycle paths, accessible walkways, parking, shuttle stops, etc.), and the addition of new buildings and structures. Two of the buildings within the Historic Resources ORV had been adapted for new uses—the former Fish Hatchery was rehabilitated for public use as a Nature Center, and Residence 1 (the Superintendent’s House) was abandoned as a residence and used for administrative offices until the 1997 Flood, when all use of it ceased. The Yosemite Valley Historic Resource ORV’s setting, consisting of the Yosemite Valley Historic District and cultural landscape, had been altered by changes in vegetation management practices, removal and replacement of bridges and other facilities, and addition of new facilities. Changes in the natural systems and features are documented under other ORV discussions above, largely consisting of conifer encroachment into meadows, scenic vistas, and black oak woodlands.

### ***Current ORV Condition***

Many of the changes to this ORV identified above continue to the present. It is important to recognize that change is inherent in the Yosemite Valley landscape, and that the Yosemite Valley Historic Resources ORV cannot be managed as a museum piece. As with any cultural system, change is not only tolerated, but it is also embraced for the system to remain vibrant. For example, The Ahwahnee has undergone initial phases of a planned comprehensive rehabilitation to address code compliance for fire protection, egress, accessibility, and other issues to improve its functionality and operational efficiency as a luxury lodging establishment. The work will adversely affect some aspects of the NHL historic property (for example, introduction of non-historic elements to provide emergency egress, reconfiguration of some significant interior spaces to achieve accessibility); however, measures have been implemented to minimize these effects to the extent feasible, as part of the process for complying with Section 106 of NHPA. Buildings and structures have been added to the setting of the Yosemite Valley Historic Resources ORV as part of the ongoing programs of visitor-use management and park administration in Yosemite Valley. Examples of these are the shuttle stop shelters constructed at The Ahwahnee and the LeConte Memorial Lodge NHLs. These structures were designed to complement the existing historic settings. Other elements of the Historic Resources ORV, most notably the Yosemite Valley Chapel and Residence 1 (the Superintendent’s House), were affected by the 1997 winter flood. The Chapel received preservation maintenance treatment to remediate the effects of inundation, while use of the Superintendent’s House was discontinued. The building was mothballed until a decision could be made regarding its disposition; it is currently in poor condition. The remaining buildings and structures of the Yosemite Valley Historic Resources ORV receive regular inspection and preservation maintenance.

### ***Management Program for ORV 10***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. This ORV may be influenced by management actions concerning visitor use management,



development and redevelopment, removal, loss or damage through catastrophic natural events, or changes in physical condition due to neglect. Management actions that change the individual elements and/or the larger cultural landscape setting can impact this ORV. The indicator discussed below monitors a primary aspect of the ORV's importance, the physical condition of the individual elements.

### **Indicator – List of Classified Structures Condition Assessments**

Given that the Yosemite Valley Historic Resources ORV is comprised of buildings and structures, this indicator is a collective measure of the physical condition of these individual elements. The NPS' List of Classified Structures (LCS) provides a mechanism that captures physical assessments of the condition of individual buildings and structures. The LCS will be used to obtain individual assessments of each building and structure at five-year intervals, and these individual assessments will be aggregated to form a collective assessment of the condition of the ORV.

The LCS Conditions provide a consistent means for assessing the condition of historic structures on a national basis. Condition levels are defined as follows:

**Good:** The structure and significant features are intact, structurally sound, and performing their intended purpose. The structure and significant features need no repair or rehabilitation, but only routine or preventative maintenance.

**Fair:** The structure is in fair condition if either of the following conditions is present:

- There are early signs of wear, failure, or deterioration, though the structure and its features are generally structurally sound and performing their intended purpose; or
- Deterioration or damage affects more than 15% of the structure.

**Poor:** The structure is in poor condition if any of the following conditions are present:

- The significant features are no longer performing their intended purpose;
- Significant features are missing;
- Deterioration or damage affects more than 25% of the structure; or
- The structure show signs of imminent failure or breakdown.

### ***Management Standard***

The management standard for this indicator is protection of at least 70% of the existing elements of the Historic Resources ORV in "good" condition, and none in "poor" condition, as defined by the LCS guidance. The condition of the NHL elements is weighted by a factor of two to account for their elevated level of significance.

Of the elements comprising this ORV, two of the NHL elements are in "good" condition, and 14 non-NHL elements are in "good" condition. Using the weighted factor described above, 60% of the collective's elements are in "good" condition, and one building—Residence 1 (Superintendent's House)—is in "poor" condition.

### ***Adverse Effect***

An adverse effect, as defined under WSRA, would be a noticeable deterioration in the condition of the collection of existing elements that comprise the ORV. Adverse effect would occur if either or both of the following conditions were met:

- 50% or more of the individual elements of the Historic Resources ORV assessed in “fair” condition
- Any NHL element assessed to be in “poor” condition, as defined by the LCS guidance
- 15% of the non-NHL elements assessed to be in “poor” condition, as defined by the LCS guidance

### ***Degradation Standard***

Degradation is quantified for this indicator as the point at which 50% or more of the ORV elements were assessed to be in “poor” condition.

### ***Monitoring – LCS Condition Assessments***

Monitoring would be conducted at all of the contributing elements at a five-year interval, in keeping with NPS standards for List of Classified Structures (LCS) condition assessments. This schedule would be augmented to provide reactive condition assessments at individual buildings and structures in response to unforeseen natural events (such as extreme flooding, fire, etc.) that are likely to have affected their condition. Monitoring results would be summarized and analyzed in this same five-year interval, or in response to any extreme unforeseen natural events.

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of an ORV has reached one of the trigger points identified in Table 5-22 below. The NPS monitors the condition of the individual elements of the Historic Resources ORV to assess whether its condition has reached or exceeded the trigger point value for this indicator.

**TABLE 5-22: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR YOSEMITE VALLEY HISTORIC RESOURCES (LIST OF CLASSIFIED STRUCTURES CONDITION ASSESSMENT)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
Damage or deterioration of five or more individual buildings or structures (15% of the collective ORV) that results in an LCS condition assessment of “fair”	<ol style="list-style-type: none"> <li>1. Increase the frequency of condition assessments for buildings and structures in “fair” condition</li> <li>2. Develop prioritized list of preservation actions based on severity of deterioration (addressing deterioration at NHL buildings and structures first)</li> <li>3. Preservation maintenance or repair to arrest ongoing deterioration and reverse damage</li> </ol>	The rationale for taking action at this threshold is to ensure repairs are made to reverse damage or deterioration noticeable at the collective level, and prevent the condition of buildings or structures from deteriorating to a “poor” condition. These corrective actions should arrest any ongoing deterioration, and return at one or more of the buildings or structures to “good” condition.

A management concern is present regarding the number of buildings and structures that have a currently-assessed condition of “fair.” Furthermore, Residence 1 (the Superintendent’s House) is in “poor” condition, which is also below the management standard. To address these concerns, general and specific responses would be required. Generally, preservation maintenance and/or repairs would occur, in keeping with the Secretary of the Interior’s Standards for Treatment of Historic Properties (NPS 1995), sufficient to return all of the NHL elements to “good” condition, and to arrest ongoing deterioration of other elements. The following specific measures would be implemented to address these management concerns:

- Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to “good” condition.

- Develop a Historic Structures Report for the LeConte Memorial Lodge NHL to determine the rehabilitation needs to bring the building to “good” condition.
- Rehabilitate Residence 1 (the Superintendent’s House) per the Historic Structure Report (Lingo 2012) to bring the building to “good” condition. This rehabilitation of the building will occur under all action alternatives, regardless of whether the building is relocated.

These specific actions would be further developed through consultation with the California State Historic Preservation Office and reflected in detail in the plan-specific programmatic agreement.

### ***Management Considerations and Enhancement Actions***

Management considerations related to the Yosemite Valley Historic Resources ORV would target improving the condition of buildings and structures that are currently in “fair” condition, and maintaining the condition of buildings and structures that are currently in “good” condition. There are no specific actions unique to the *Merced River Plan/DEIS* that would address these management considerations. Following is a list of current standard operating procedures that would enhance the contributing elements of the Yosemite Valley Historic Resources ORV:

- Continuing the active program of historic buildings and structures maintenance and repair in Yosemite Valley
- Maintaining the essential qualities of the individual historic developed areas in Yosemite Valley through documentation in the NPS’ Cultural Landscape Inventory program as well as by guidance in treatments identified in management documents, such as Cultural Landscape Reports and Historic Structure Reports
- Employing the Design Guidelines for Yosemite National Park’s recommendations for Yosemite Valley to ensure new development or redevelopment protects the Yosemite Valley Historic District’s essential historic character
- Periodically assessing and updating the National Register documentation for the Yosemite Valley Historic District as EIS-related management actions are implemented, to support its long-term management
- Periodically assessing and updating documentation for individual elements of the Historic Resources ORV or Yosemite Valley Historic District (historic structure reports, cultural landscape reports, individual National Register nominations for historic districts, National Historic Landmark documentation, for example), as management actions are implemented to support their long-term management

### ***Conclusion: Protecting and Enhancing ORV 10 (Yosemite Valley Historic Resources)***

The Yosemite Valley Historic Resources ORV is determined to be absent of adverse effects and degradation as defined by WSRA. Management concerns are present, with one structure in poor condition and the aggregate condition of the collection of elements falling below the management standard. As a response, the NPS will rehabilitate the Superintendent’s House (Residence 1) in keeping with the Secretary of the Interior’s Standards, with a goal of returning the building to “good” condition and utilizing it for a compatible contemporary use. The NPS will also document and interpret any building or structure threatened with removal or relocation. In this manner, while the individual tangible element or elements may be lost or moved, a record of their existence and historical significance will still be available to the public. To address management considerations, the *Merced River Plan/DEIS* does not propose any actions

beyond current standard operating procedures that include continuing the active program of maintenance for historic buildings and structures; employing existing design guidelines to ensure that new development or redevelopment complements the ORV and the Yosemite Valley Historic District; and periodically assessing and updating professional documentation for the historic resources.

## Cultural ORV—El Portal Archeological District

**ORV 11—The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region including the archeological remains of the Johnny Wilson Ranch, a regionally rare historic-era American Indian Homestead.**

**Location:** Segment 4 (El Portal)

**Rationale:** El Portal's location midway between Yosemite Valley and the San Joaquin Valley made it an important place of settlement, subsistence, and trade along the Merced River. The steep, narrow canyon at El Portal includes river terraces with level lands on which villages were built. The presence of Great Basin and Pacific Coast artifacts indicates that El Portal was a location of continuous, far-reaching traffic and trade. The El Portal Archeological District encompasses an archeological landscape containing dense concentrations of resources representing some of the oldest deposits in the Sierra foothills, with data important to interpreting regional cultural history as old as 9,500 years. Particularly significant are the archeological remains of the Johnny Wilson Ranch, a rare example of an American Indian Homestead, which took advantage of the river as an irrigation source. In addition to the regionally significant scientific and interpretive value of the archeological district, the sites have value to park-associated American Indian tribes and groups as a connection to their ancestors. These groups maintain their rights to practice their religion and ceremonies as they have for thousands of years.

**Management Objective:** Archeological sites within the El Portal Archeological District would be monitored to ensure protection and enhancement of the district as a whole, and to ensure that human impacts are not adversely affecting the district's essential character and integrity.

### *ORV Condition at the Time of Designation (1987)*

Sites within the El Portal Archeological District have been impacted by from historic development and more recent NPS administrative uses. Construction of the Yosemite Valley Railroad and Highway 140, logging, mining, concession operations, and park facility or residential construction had damaged 30% or more of eight sites listed in the district (NPS 1976). Four sites are known to have experienced particularly severe damage, most notably a large ancient village and cemetery developed for park infrastructure needs.

Sites have also experienced impacts from visitor use. Unauthorized collection of surface artifacts was presumed at several sites, although this type of impact is very difficult to document (NPS 1976). During excavations in 1959-1960, a significant amount of information was intact beneath the surface at some sites within the district (Fitzwater 1962).

### *Current ORV Condition*

The condition of the El Portal Archeological District has not changed significantly from the time of designation (Darko 2011). Recent information suggests that one site in the district exhibits evidence of moderate visitor use impacts. Also, bioturbation and impacts from the 1997 flood have impacted sites within the district.

## ***Management Program for ORV 11***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. This ORV utilizes the same indicator to monitor the aggregate condition of the collection of archeological sites within the district as the indicator described under Cultural ORV 9 – Yosemite Valley Archeological District (Table 5-21). The management standards, definitions of adverse effect and degradation, monitoring program, and trigger points are the same as described under ORV 9.

Human impact values for a sample of relevant El Portal Archeological District sites are shown below (Table 5-23). Results are drawn from archeology visitor use yearly site monitoring for a sample set of six sites (27%) from a total of 22 El Portal District sites relevant to the Merced River corridor ORV. Over a five-year interval (2007-2011), 100% of high data potential sites and 100% of low data potential sites in the sample were considered free of serious human impacts, meeting the management standards for the indicator.

**TABLE 5-23: PERCENTAGE OF EL PORTAL ARCHEOLOGICAL SITES FREE OF CURRENT SERIOUS UNMITIGATED IMPACTS<sup>a</sup> IN A MONITORED SAMPLE SET (N=6)**

High data potential	Low data potential
100%	100%
<sup>a</sup> Note: Impacts with partial loss irretrievable effects with moderate to severe damage levels or multiple (≥3) impacts with low damage levels.	

## ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-21. There are no management concerns associated with the El Portal Archeological District.

## ***Management Considerations and Enhancement Actions***

Management considerations for this ORV include abandoned infrastructure located on CA-MRP-0181/H in Rancheria, which impact an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians. Also, informal trails, non-essential gravel roads, and visitor use contribute to archeological site disturbances at CA-MRP-0250/H and CA-MRP-0251/H in Old El Portal. To address these management considerations, the NPS will undertake the following actions:

- In recognition of the high cultural significance of CA-MRP-181 for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.
- Informal trails, non-essential roads, and abandoned infrastructure would be removed to protect and enhance the archeological resources contributing to the ORV in Segment 4.
- Remove informal trails and non-essential roads.

### ***Conclusion: Protecting and Enhancing ORV 11 (El Portal Archeological District)***

This cultural ORV is absent of adverse effects and degradation. No management concerns are present, but some management considerations are present. These considerations will be remedied by removing informal trails and roads and addressing the abandoned infrastructure in site CA-MRP-181. To protect and enhance this ORV in the future, the NPS will monitor the condition of the ORV and take specific actions should specific trigger points be reached. Trigger points are selected to inform managers well in advance of adverse effects or degradation impacts on this ORV.

### **Cultural ORV—Regionally Rare Archeological Features, including Rock Rings**

**ORV 12—This segment includes regionally rare archeological features representing indigenous settlement and use along the South Fork of the Merced River at archeological sites with rock-ring features.**

**Location:** Segment 5 (South Fork Merced River above Wawona)

**Rationale:** Three regionally rare prehistoric archeological sites are located in this segment of the South Fork of the Merced Wild and Scenic River corridor. The sites contain unique stacked rock ring constructions and rock alignments. Two sites also contain pine timber remains within the ring interiors or incorporated into the stacked rock courses. Stacked rock ring structures are highly uncommon in the park (Hull and Moratto 1999:27) and their function is unknown. The rings may be associated with hunting activities at the nearby soda springs, a natural source of salt for animals (Knieriemen 1976). To date, no sub-surface testing, dendrochronological analysis, or data recovery has been conducted at the rings.

Rock constructions are considered fragile and highly subject to human alteration from camping and campfire building disturbances. Two of the South Fork sites are adjacent to formal NPS trails, increasing the likelihood of disturbance. Damage assessments at similar rock ring sites near Johnson Lake in the southern portion of the park over two decades have noted rock ring features disassembled for use in fire rings, alignments cleared for sleeping or tent placement, and recent fire rings within features (Jackson 2005; Curtis 2011; Curtis and Darko, 2012). The latter disturbance is particularly threatening for rare wood elements at the South Fork sites, opening the possibility of opportunistic use as campfire fuel before scientific analysis can be conducted. Human impacts noted, but not formally documented, at Wilderness Historic Resource Survey (WHRS) Structure 53 include campfire rings and garbage within the rock feature, structural alterations, and rock “furniture” constructed near the feature (Montague 2005).

Two of the sites, CA-MRP-2296 and CA-MRP-2363, were documented and monitored for site condition in 2010. A third site, WHRS Structure 53, has not been recorded to current Yosemite standards (Snyder 1992; Montague 2005). The vicinity of the sites has not been systematically surveyed, and it is possible that additional rock ring sites may be present along the South Fork. Should additional rock ring sites be discovered in the monitoring process, they will also become a part of the South Fork ORV.

**Management Objective:** Prehistoric archeological sites with rock rings along the South Fork of the Merced River above Wawona will be monitored to ensure that human impacts do not adversely affect the essential character and integrity of the sites.

### ***ORV Condition at the Time of Designation (1987)***

Knierieman (1976) penned a short paper that described stacked rock rings with timbers within this river segment, their locations, associated artifacts, estimated temporal affiliations, and known impacts (1976). At the time, Wilderness campers had reportedly destroyed at least one feature in a different area. Knierieman described the features as being in a “dilapidated condition” from natural processes. To date, no sub-surface testing, dendrochronological analysis, or data recovery has been conducted at the rings.

### ***Current ORV Condition***

A Wilderness Historic Resources Survey conducted in 1992 reported that campers had built a bonfire in one of the rock-ring features, destroying any remnants of the wooden timbers (Snyder 1992). No impacts were noted at a second rock-ring feature. Re-visitation and formal documentation as part of the park's archeological assessment program in 2000 (Quinn 2001) and 2002 (Jackson and Hagen 2007) reported two of the sites in fair and good condition, with natural erosional processes and vegetation growth the only sources of impacts. A 2005 visit of the sites noted that one of the features had been partially rearranged by campers to create campfire rings and a rock "table;" this was the same feature that Snyder had earlier reported a bonfire (Montague 2005). Garbage was also noted at this feature, approximately 10 meters from a hiking trail.

### ***Management Program for ORV 12***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. The NPS would monitor the condition of this ORV in conjunction with the Wawona Archeological District (ORV 13), using the same management standards, definitions for adverse effect and degradation, indicators, triggers, and management response to triggers.

### **Indicator - Condition of Individual Rock-Ring Sites**

The indicator is the condition of individual rock-ring sites. Site condition includes the general physical state of the site and associated material remains; site stability, or potential for physical deterioration over time; and site integrity, the potential to convey information, setting, feeling, and association of previous historical eras to researchers, the public, and traditionally associated peoples.

Archeological site condition was chosen as an indicator because this characteristic is sensitive to human disturbance, an observable harmful effect on the integrity or data potential of a site resulting from human activity. There is a direct relationship between the degree of site disturbance and current site condition (NPS 2007a). Site disturbances, or impacts, can lead to the irretrievable loss of archeological resources at the individual site level (NPS 2007b). The cumulative loss of individual site resources within the ORV group can ultimately result in degradation of the ORV as a whole.

### ***Management Standard***

The management standard for the sites is to sustain three or fewer serious human impacts to the rock-ring ORV site group in a five-year monitoring interval. This impact maximum may occur at a single site (one site receives three disturbances) or be spread over multiple sites (each site receives one disturbance). Serious unmitigated human impacts are single disturbances with partial or total loss irretrievable disturbance effects at moderate to severe site damage levels, or a series of three or more disturbances with partial or total loss—irretrievable disturbance effects at low site damage levels. Unmitigated impacts are disturbances uncorrected by management action under regulatory context such as Section 106 of the National Historic Preservation Act.

Current site condition and impact numbers are indicated in Table 5-24. Results are drawn from Archeology Visitor Use yearly site monitoring, 2007-2011, Wilderness Historic Resources Survey (WHRS) in 1992, and project field reports in 2005. The two recorded sites are currently in good condition with no reported

human impacts and meet the management standard. A third undocumented prehistoric site, WHRS Structure 53, has 1-2 informally reported human impacts. While the site appears to meet the management standard, the purported impacts may trigger immediate management actions for site preservation.

**TABLE 5-24: CURRENT SITE CONDITIONS OF INDIVIDUAL ROCK RING ARCHEOLOGICAL FEATURES**

Site No.	Site Condition 2010	Human Impacts
CA-MRP-2296	Good	0
CA-MRP-2363	Good	0
WHRS Structure 53	Unknown	1-2*
* Noted but not formally documented or condition assessed by Montague (2005).		

In balancing visitor use and site preservation, some disturbances to resources can be acceptable if the site retains context and integrity (Fairley and Downum 2000). For sites with estimated high data potential, such as rock ring sites with unique attributes, the potential resource loss is greater, particularly given the small number of sites known to make up the ORV. A serious human impact or series of minor impacts resulting in irretrievable damage and loss at high data sites is less acceptable in such cases (Donnermeyer 2005:43), and the management standard (a maximum of three impacts in a monitoring interval) targets appropriate site protection levels based on professional judgment of condition assessments at similar sites within the southern portion of the park (Jackson 2005; Curtis 2011; Curtis and Darko 2012).

### *Adverse Effect*

Adverse effect occurs when human disturbances to the rock ring ORV site group exceeds three serious human impacts in a five-year monitoring interval. This impact may occur at a single site (i.e. one site receives four disturbances) or be spread over multiple sites (i.e. each site receives one or more disturbances).

The adverse effect represents a 33% increase in site standard violations over a five-year time span. The increase serves as a warning of long term downward trends in site condition, allowing for protective management actions before widespread site damages threaten the essential character of the ORV (Donnermeyer 2005:33).

### *Degradation Standard*

Degradation occurs when two or more sites comprising the ORV show severe disturbance severity levels and poor site conditions due to human impacts.

Severe disturbance levels indicate a prior history of disturbances causing major site damage. Sites or major portions of sites will likely be lost if actions to protect and/or preserve are not taken within two years. Poor site conditions result from multiple current disturbances causing loss of site features or key areas that define primary site function and are critical to site data potential for historical or scientific research. Such losses make it difficult to utilize any remaining site data (NPS 2007). The combination of prior and current damage causes a near total loss of site significance and integrity. When the majority of sites ( $\geq 2$ ) within this small collection of rare site types lose significance and integrity, the essential value of the ORV is lost.



### ***Monitoring – Condition of Archeological Sites in High Elevations of the South Fork Merced River***

Monitoring would occur in Segment 5, South Fork above Wawona. Site condition assessments will be conducted for the rock ring sites at 5-10 year monitoring intervals, following the assigned ASMIS site inspection schedule. Given the sites' remote locations, a 10 year monitoring interval may be appropriate if site documentation is fully completed (NPS 2007b). Monitoring and full site recording at WHRS Structure 53 will be regarded as a high priority due to lack of formal documentation and unknown condition, and will be conducted at the earliest possible opportunity in the site monitoring schedule.

The key source of feedback for adaptive archeological site management is the periodic, systematic analysis of collected site data, focused on management objectives (Kintigh et al. 2007). To achieve this feedback and assess trigger points for management actions, summary reporting of site monitoring results for the aggregate site group will be compiled at five year intervals to determine maintenance of the management standard and avoidance of adverse effects or degradation. This five year interval for summary reporting and analysis of site data is the minimum reporting period necessary for accurate capture of human impacts over longer time spans (Bane 2011:43). Table 5-25 lists triggers and specific management responses that would take place should conditions reach the trigger points.

**TABLE 5-25: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR REGIONALLY RARE ARCHEOLOGICAL FEATURES (INDIVIDUAL ROCK RING SITES)**

<b>Trigger Point(s) at Which Management Action Would Be Taken</b>	<b>Possible Management Actions</b>	<b>Rationale for Management Actions</b>
A. One (1) serious human impact to a rock ring site in a five-year monitoring interval.	A. Increased monitoring frequency at affected sites and other ORV sites within vicinity. This may include archeological monitoring and /or Law Enforcement/ backcountry ranger monitoring.	A. Extreme component vulnerability and high research potential at rare rock ring sites requires increased monitoring frequencies after single cases of serious disturbances.
B. Two (2) serious human impacts to the rock ring ORV site group in a five year monitoring interval. This impact may occur at a single site (i.e. one site receives two disturbances) or spread over multiple sites (i.e. two sites receive one disturbance each).	B. Increased management protection designed to counteract or minimize impacts, crafted to individual site specifications or to site group. Examples include: <ul style="list-style-type: none"> <li>• Site documentation, research, testing, or NRHP evaluation;</li> <li>• Dendrochronological analysis of rare wood elements;</li> <li>• Site stabilization, re-vegetation, trail reroutes, trail removal;</li> <li>• Increased outreach/education to permitted users such as backpackers;</li> <li>• Data recovery at affected sites;</li> <li>• Closure of areas to camping, utilizing law enforcement monitoring and increased visitor education about human impacts and the necessity for closures. Area closure regulations will be represented within the superintendent's compendium in order to allow legal enforcement.</li> </ul>	B. Extreme component vulnerability and high research potential at rare rock ring sites requires timely management prescriptive actions before management standard levels are violated.

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-25 above. There are no management concerns associated with the two recorded sites along the South Fork Merced River. A third undocumented prehistoric site (WHRS Structure 53) has one to two informally reported human impacts. While the site appears to meet the management standard, the purported impacts may meet one or both of the triggers identified in Table 5-25, depending on whether the

human impacts are serious. If they are, management concerns are present at that site, and NPS will take immediate management actions for site preservation.

### *Management Considerations and Enhancement Actions*

Management considerations for this ORV include wilderness camping, which can disturb rock ring features when campers move rocks to create fire pits or use wooden material associated with archeological features for firewood, and informal trails and visitor use, which can cause ground disturbing impacts to surface and sub-surface archeological resources at CA-MRP-0218.

To remedy these considerations, NPS will:

- Complete documentation of the features. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker). Remove informal trails and charcoal rings.
- Increase education and outreach to Wilderness travelers.

### *Conclusion: Protecting and Enhancing ORV 12 (regionally rare archeological features)*

This cultural ORVs is determined to be absent of adverse effects and degradation, although management considerations are present. To remedy these considerations, the NPS would complete documentation of rock ring features, evaluate the need for scientific study through dendrochronological analysis, remove informal trails in the vicinity of archeological sites, and increase education and outreach to Wilderness travelers. To prevent future impacts, the NPS would monitor the condition of the ORVs, and take specific actions should specific trigger points be reached. Trigger points are selected to inform managers well in advance of adverse effects or degradation impacts on this ORV.

## **Cultural ORV—Wawona Archeological District**

**ORV 13—The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. Segment 7 includes the remains of the U.S. Army Cavalry Camp A. E. Wood documenting the unique Yosemite legacy of the African-American buffalo soldiers and the strategic placement of their camp near the Merced River.**

**Location:** Segments 5 (South Fork Merced River above Wawona), 6 (Wawona Impoundment), 7 (Wawona), and 8 (South Fork Merced River below Wawona)

**Rationale:** Because there are few springs and no talus shelters in the Wawona area, sites of human activity reaching back thousands of years are concentrated along the river. The presence of Great Basin and Pacific Coast artifacts indicates that Wawona was a location of continuous far-reaching traffic and trade. Sites in this district contain important information relevant to research regarding permanent and semi-permanent settlement along a particularly long mid-elevation meandering river. In addition to the regionally significant scientific and interpretive value of the archeological district, the sites have value to park-associated American Indian tribes and groups as a connection to their ancestors. These groups maintain their rights to practice their religion and ceremonies as they have for thousands of years.

Physical remnants of the African-American Buffalo Soldiers' late 19<sup>th</sup> and early 20<sup>th</sup> century federal protection of Yosemite National Park are present along the South Fork Merced River in Wawona. These reflect extremely rare African American army troop guardianship of national park lands. These are represented in the archeological remains of Camp A.E. Wood, the first Army headquarters in the park, which was situated near the South Fork and its year-round water source.

**Management Objective:** Archeological sites within the Wawona Archeological District would be monitored to ensure protection and enhancement of the district as a whole, and to ensure that human impacts are not adversely affecting the district's essential character and integrity.

### ***ORV Condition at the Time of Designation (1987)***

When the Wawona Archeological District was determined eligible for listing in the National Register of Historic Places in 1979, it had undergone very little in the way of archeological testing or excavation. The statements of significance on the National Register nomination form were based largely on surface assemblages and the potential for subsurface deposits, rather than explicit knowledge of the nature of such deposits. This potential was confirmed when Ervin (1984) carried out limited auger testing at 24 sites and performed test excavations at nine of the sites during the field seasons of 1983 and 1984 in anticipation of a water/wastewater infrastructure project. The results of this investigation proved that many sites within the Wawona Archeological District contained intact, and in some cases deeply buried, cultural deposits with the potential to reveal much about the pre-contact inhabitants of the area. As a result of this fieldwork, plans for the infrastructure development were modified to avoid or reduce impacts to known sites, which kept them in overall excellent condition. Although substantial historic-period development has occurred within portions of the Wawona Archeological District, Ervin (1984) concluded that impacts mainly affected surface artifact assemblages and only limited portions of subsurface deposits, leaving intact cultural materials with the potential to address important research questions related to the long history of human habitation and use of the Wawona area.

After the departure of U.S. Army troops from Camp A.E. Wood, the area was abandoned for several years until a public campground—known as “Camp Hoyle”—was established in the same location. In 1951, the campground was enlarged, improved, and renamed Camp A.E. Wood (Sargent 1961). The Wawona Campground grew around the site, with the portion known as Camp A.E. Wood eventually incorporated into the popular camping spot. Archeological survey work conducted for the National Register nomination of the Wawona Archeological District noted the presence of significant historic-era cultural materials but did not explicitly connect any of these remains to the early Army camp or to the African-American soldiers assigned to park duty (NPS 1978). Further evaluation of several sites in the district during 1983-1984 fieldwork revealed a wealth of military and domestic artifacts related to Camp A.E. Wood, and possibly the early homestead of 1860s settler Stephan Cunningham, located within and adjacent to the current Wawona Campground (Ervin 1984). Square-cut nails, gun cartridges (a majority dating to 1899-1905), bullets, can fragments, bottle and window glass, and rotting wood were discovered in the top 6 centimeters of one of the test excavation units. During the 1983 field season, Ervin (1984) noted that disturbances to the historic-era component of the site were mainly a result of formal campground construction and maintenance, beginning with campsite and road grading, restroom construction, and other infrastructure development in the 1940s and continuing with the burial of modern campsite trash, casual collection of artifacts, and tent trenching practices. However, Ervin (1984) concluded that despite these impacts, the historic component of the site contained important information related to the U.S. Army’s use of the area and possibly to early homesteading activities, as well.

### ***Current ORV Condition***

Of the 29 Wawona Archeological District sites visited during the 2007-2009 field seasons, 13 sites were estimated to have experienced severe impacts. Nine additional sites had a moderate degree of disturbance, and seven sites had a low rate of impact. Visitor use impacts were present at all but three of the monitored sites (Middleton [NPS] 2008, 2009, 2010). A recent condition assessment of the total 59 sites in the Wawona Archeological District within the Merced River Corridor found that 33% (19 sites) are in good condition, with an additional 38% (23 sites) in fair condition (Darko 2011). Eleven of the sites are in poor condition,

while four could not be relocated during an attempted field visit, and two with unknown conditions were not visited as part of the project because they were outside the MRP study area. Darko's 2011 report corroborated the earlier estimations of disturbance severity levels, with 20 sites (35%) exhibiting a low level of disturbance, 17 (29%) having a moderate disturbance severity level, and 12 (19%) showing severe impacts. Ten (17%) of the sites within the 2011 Wawona Archeological District study area could not be assessed for disturbance severity levels.

Ongoing use and maintenance of the Wawona Campground continues to present potential impacts to the archeological remains of U.S. Army Calvary Camp A.E. Wood. Extensive flooding in 1997 may also have contributed to impacts. Flood-related impacts to this site and others in the Wawona Archeological District were assessed in 1999 and 2004 (Montague and Valdez 2004). As of the most recent assessment, Camp A.E. Wood and the other examined sites in the district still possessed intact cultural deposits, but additional investigation of these sites was needed to more fully define their horizontal and vertical extent and integrity. Additional historical research was recommended to correlate the historic-era artifacts within the Wawona Campground to the occupation of the site by the U.S. Army Calvary troops (Montague and Valdez 2004).

Impacts seen at archeological sites within this ORV segment fall into largely the same categories as those noted in the Yosemite Valley and El Portal archeological districts: administrative/facilities-related impacts such as campground and infrastructure maintenance, visitor use impacts (including general trampling, artifact collection, and creation of informal trails), and natural impacts such as flooding and erosion.

### ***Management Program for ORV 13***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. This ORV utilizes the same indicator to monitor the aggregate condition of the collection of archeological sites within the district as the indicator described under Cultural ORV 9 – Yosemite Valley Archeological District. The management standards, definitions of adverse effect and degradation, monitoring program, and trigger points are the same as described under ORV 9 (Table 5-21).

Human impact values for a sample of relevant Wawona Archeological District sites are shown below (Table 5-26). Results are drawn from Archeology Visitor Use yearly site monitoring for a sample set of 36 sites (42%) from 86 Wawona District sites relevant to the Merced River corridor ORV. Archeological sites outside of the river corridor judged not to be river-related (Wawona Meadow) and sites completely or mostly on private land are not included in the district site total. Over a five year interval (2007-2011), 92% of high data potential sites and 94% of low data potential sites in the sample were considered free of serious human impacts, meeting the target management standards for the indicator.

**TABLE 5-26: PERCENTAGE OF SITES FREE OF CURRENT SERIOUS UNMITIGATED HUMAN IMPACTS<sup>a</sup> FOR A MONITORED SAMPLE SET (N=36), WAWONA ARCHEOLOGICAL DISTRICT, 2007-2011**

High data potential	Low data potential
92%	94%
<sup>a</sup> Note: Impacts with partial loss irretrievable effects with moderate to severe damage levels or multiple (≥3) impacts with low damage levels.	

Portions of the Wawona Archeological District fall outside of the Merced Wild and Scenic River corridor boundaries. Portions of the Wawona District are also privately owned or in mixed public/private ownership areas. Sites located completely or mostly on private land would not be included in monitoring assessments due to lack of NPS jurisdiction. Monitoring at CA-MRP-168/329/H, the location of historic Camp A. E. Wood, would be regarded as a high priority, and conducted at the earliest possible opportunity in the site monitoring schedule.

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-21 under ORV 9, above. There are no management concerns associated with the Wawona Archeological District, as indicated by a five-year monitoring interval between 2007 and 2011.

### ***Management Considerations and Enhancement Actions***

There are several management considerations for this ORV: the Wawona Archeological District is subject to site-specific impacts from park operations, visitor use, artifact collection, vandalism, and ecological processes; visitor use at Wawona Campground is potentially causing localized adverse effects to site CA-MRP-168/329/H (Camp A.E. Wood), with ground disturbing activities potentially causing impacts to the shallow deposit of historic artifacts and features and modern campsites sometimes obscuring the historic setting of Camp A.E. Wood; informal trails and variety of operational and visitor uses cause ground disturbing impacts to surface and sub-surface archeological resources at CA-MRP-0008/H; and shoulder and off-road parking causing impacts to archeological resources on archeological site CA-MRP-0171/172/254/516/H. The following actions would help to address these issues:

- Increase monitoring frequency at affected sites.
- Increase management protection designed to counteract or minimize impacts, and craft to individual site specifications.
- At the district-wide level, revise the existing National Register nomination to reflect changes since its original writing, for example, incorporating newly discovered resources and documenting impacts.
- Remove seven campsites from Wawona Campground that cause potential impacts to the archeological site.
- Consider need for archeological site treatment measures to address impacts to shallow deposits of artifacts and features. Remove informal trails and develop site management plan.
- Remove informal trails and fire rings adjacent to shoulder and off-road parking in proximity to the site to prevent continuing disturbance.

### ***Conclusion: Protecting and Enhancing ORV 13 (Wawona archeological district)***

The Wawona Archeological District is absent of adverse effects, degradation, and management concerns (conditions that exceed management triggers). Management considerations are present. To address management considerations, the NPS would remove seven campsites that cause impacts to the Camp A.E. Wood archeological site, and initiate a variety of actions to address specific considerations including removal of informal trails, non-essential roads, and infrastructure that impact archeological sites under Alternatives 2-6. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the

ORV, and take specific actions should specific trigger points be reached. These trigger points are selected to inform managers well in advance of adverse effects or degradation impacts on this ORV.

## Cultural ORV—Wawona Historic Resources

**ORV 14—The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park and one of the few remaining in the United States with this high level of integrity.**

**Location:** Segment 7 (Wawona)

**Rationale:** Galen Clark, Yosemite's first guardian, built the original Wawona Covered Bridge in 1868, which became the bridge as it is today. The Bridge boasts state significance within transportation, entertainment, and recreation contexts. The bridge embodies the distinctive characteristic of a unique type of construction and is the only historic covered bridge in the western region of the NPS. The Wawona Covered Bridge is individually listed in the National Register of Historic Places, and is also a contributing resource to the Pioneer Yosemite History Center Cultural Landscape Inventory, determined eligible for listing in the National Register of Historic Places.

The National Historic Landmark (NHL) Wawona Hotel is a complex of buildings and structures built between 1876 and 1918 adjacent to the South Fork Merced River. It was built on the site of Galen Clark's Station, the original stop along one of the main access trails (and later wagon road) to Yosemite Valley. The complex includes seven buildings laid out in a formal pattern along perpendicular axes on a rolling hill, accessed by a circular drive with a central fountain. The complex is unique in its historical integrity – the architectural unity, the formal placement on the rural landscape, the original building materials, and their form and massing. The hotel complex retains exemplary integrity of function given its use as a resort complex for over one hundred years. It is of national significance in architecture, unique as the largest existing Victorian hotel complex within the boundaries of a national park, and rare for its high level of integrity. It is also of national significance in art because it contains the Thomas Hill Studio. Landscape painter Thomas Hill, one of the last painters of the Hudson River School, painted here during summers between 1886 and his death in 1908.

**Management Objective:** These structures will be managed to ensure the protection and enhancement of their historical integrity. Protection and enhancement will ensure that management actions, including managing for visitor uses, do not adversely impact the ORV.

### *ORV Condition at the Time of Designation (1987)*

The Wawona Covered Bridge is listed in the National Register of Historic Places. At the time of the 1987 Wild and Scenic River designation, the Wawona Covered Bridge had recently undergone structural safety improvements. The NPS had dismantled and restored the bridge in 1956 and 1957, employing hand-hewn timber construction in the same style as the original bridge. Some timbers were replaced in 1961 and again in 1983 when NPS corrected structural safety hazards following an inspection of the bridge (Greene 1987).

The Wawona Hotel, including the Thomas Hill Studio, is listed in the National Register of Historic Places as both a nationally significant historic property and a national historic landmark (NHL). The NHL nomination is included in the larger publication *Architecture in the Parks*,<sup>30</sup> which was published in 1986 - just prior to designation of the Merced as a Wild and Scenic River. Thus, at the time of designation, the hotel complex met the very high standards of integrity necessary to qualify as an NHL. This was the case despite the fact that it had transferred from the private holdings of the Washburn Family to NPS ownership in the 1930s and had undergone recent rehabilitation to install a fire sprinkler system. According to the 1998 condition assessment, the building exteriors "are generally highly intact and are composed of historic wood siding, with original door and window openings and trim. Roof cladding, while not original, is of the original

<sup>30</sup> Laura Soulliere Harrison: *Architecture in the Parks: A National Historic Landmark Theme Study*. USDI National Park Service, U.S. Government Printing Office, Washington, D.C., 1986.

type.”<sup>31</sup> The NHL nomination notes that the buildings of the complex had “undergone certain changes in recent years to improve the quality of the seasonally-offered guest services and to make the structures safer for occupancy.”<sup>32</sup> Given these general statements, it is clear that the Wawona Hotel and Thomas Hill Studio had endured incremental change since their construction in the late 19<sup>th</sup>-century, but survived largely intact and with an extremely high degree of integrity.

### ***Current ORV Condition***

Between 2002 and 2005, the Wawona Covered Bridge underwent a restoration effort to improve the deteriorating timber structure. Hand-hewn timbers were used to repair the structure in a manner similar to the original 19th-century construction. Restoration of the bridge also included:

- Constructing shoring to support the 115,000-pound timber-frame of the bridge
- Removing the 8-inch sag from the superstructure, leveling the bridge
- Removing and replacing all seven of the deteriorated 14-square-inch by 30-foot transverse floor beams
- Repairing the bridge pier masonry in the riverbed
- Restoring the structural stability of the upstream and downstream timber-frame truss assemblies
- Replacing the undersized timber components in order to resist wind and snow loading
- Replicating hand-hewed timbers using broad axes and traditional craftsmanship from 19th-century practices

All recent bridge restoration activities were designed to meet the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*, thereby ensuring that the bridge retains its historical integrity. (The Secretary’s standards were adopted in 1976, and earlier work was not designed to meet these specific standards.) Completion of the bridge restoration project inaugurated the creation of the interpretive Pioneer Yosemite History Center, with the restored bridge as a central feature.

A recent condition assessment of the Wawona Hotel Complex indicates that the hotel complex continues to retain a high degree of historical integrity.<sup>33</sup> Individual buildings within the complex are assessed to be in good condition, with some minor deterioration of historic fabric. The NHL complex has undergone recent upgrades to address seismic stability and ADA compliance as well as a series of cyclic repair and maintenance projects. The Thomas Hill Studio was recently rehabilitated and adapted for use as a visitor contact station. The fountains at the main hotel and the studio were recently restored to their historic appearance and function. Each of these projects has been accomplished consistent with the *Secretary of the Interior’s Standards for Treatment of Historic Properties*, thereby ensuring that the complex retains its historical integrity. Interior furnishings and finishes such as paint, wallpaper, carpeting, and some fixtures have been updated to maintain functionality and serviceability.

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<sup>31</sup> Carey & Co. Inc., “Wawona Hotel Complex Condition Assessment, Yosemite National Park, California.” Report on file, Yosemite National Park Resources Management and Science Library, 1988, p. ii.

<sup>32</sup> National Park Service: “National Register of Historic Places Inventory – Nomination Form for the Wawona Hotel and Thomas Hill Studio.” USDI National Park Service, n.d.

<sup>33</sup> National Park Service: “Wawona Hotel Complex Historic Structures Report.” USDI National Park Service, Yosemite National Park, California, 2012.

Table 5-27 details the current condition of the buildings and structures that comprise the Wawona Historic Resources ORV. There are eight buildings and structures, seven of which are in “good” condition, resulting in 87% in good condition.

**TABLE 5-27: CURRENT CONDITION OF WAWONA HISTORIC RESOURCES ORV**

Building/Structure	Overall Condition	Contributing Elements in “Good” to “Fair” Condition	Contributing Elements in “Poor” Condition	Source
Wawona Covered Bridge	Good	All		
Thomas Hill Studio	Good	All		LCS 2008
Clark Cottage	Fair	Porch Columns, balustrade, and trim Porch flooring and apron Wood window sash Window balance system Exterior wood doors and transoms Exterior door hardware All interior finishes, fixtures, and hardware Roof Wood Shingles and Flashing	Exterior wood siding Porch Ceiling (3-1/4 inch boards) Roof dormers	2012 HSR
Main Hotel	Good	Roof wood shingles and flashings Veranda ceiling boards Veranda trim and balustrade Main entry stair and stone abutments Wood window sash Window balance system Exterior wood doors and transoms Exterior wood channel rustic siding Brick chimneys Exterior door hardware All interior finishes, fixtures, and hardware	Exterior wood doors (with glazing) and transoms	2012 HSR
Manager’s Cottage	Good	Porch ceiling 1x4 tongue and groove Porch columns, balustrade, and trim Porch flooring and apron Wood window sash Exterior wood doors and transoms Exterior door hardware Roof wood shingles and flashings Interior finishes, hardware, and fixtures	Exterior wood siding and trim	2012 HSR
Moore Cottage	Good	Exterior wood siding Roof wood shingles and flashings Porch columns, balustrade, and trim Porch flooring and apron Porch ceiling Wood window sash Window latches Exterior wood doors and transoms Exterior door hardware Interior finishes, hardware, and fixtures		2012 HSR
Washburn Cottage	Good	Exterior wood siding and trim Window balance system Roof wood shingles and flashings Porch columns, balustrade, and trim Porch flooring and apron Porch ceiling Wood window sash Exterior wood doors and transoms Exterior door hardware Exterior stairs: north, east, west porch stairs		2012 HSR



**TABLE 5-27: CURRENT CONDITION OF WAWONA HISTORIC RESOURCES ORV**

Building/Structure	Overall Condition	Contributing Elements in "Good" to "Fair" Condition	Contributing Elements in "Poor" Condition	Source
		Interior finishes, hardware, and fixtures		
Annex Building	Good	Roof wood shingles and flashings Roof gutter and downspouts Chimneys Exterior wood shingle siding Exterior wood doors (4-panel) and transoms Porch columns, balustrade, and exposed timber structure Porch Wood window sash Window lifts and latches, obscure glass at bathrooms Exterior door hardware Interior finishes, hardware, and fixtures	Porch flooring and apron Window balance system Exterior wood doors (with glazing) and transoms	2012 HSR

### ***Management Program for ORV 14***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program.

#### **Indicator – List of Classified Structures Condition Assessment**

Given that the Historic Resources ORV is comprised of buildings and structures, this indicator is a measure of the physical condition of the individual elements – the Wawona Covered Bridge, and the Wawona Hotel and Thomas Hill Studio complex. The NPS' List of Classified Structures (LCS) provides a mechanism that captures physical assessments of the condition of the buildings and structures. The LCS will be used to obtain individual assessments of each building and structure at five-year intervals, and these individual assessments will be aggregated to form a collective assessment of the condition of the ORV.

The LCS Conditions provide a consistent means for assessing the condition of historic structures on a national basis. Condition levels are defined as follows:

**Good:** The structure and significant features are intact, structurally sound, and performing their intended purpose. The structure and significant features need no repair or rehabilitation, but only routine or preventative maintenance.

**Fair:** The structure is in fair condition if either of the following conditions is present:

- There are early signs of wear, failure, or deterioration though the structure and its features are generally structurally sound and performing their intended purpose; or
- Deterioration or damage affects more than 15% of the structure.

**Poor:** The structure is in poor condition if any of the following conditions are present:

- The significant features are no longer performing their intended purpose; or
- Significant features are missing; or
- Deterioration or damage affects more than 25% of the structure; or
- The structure show signs of imminent failure or breakdown.

### ***Management Standard***

The management standard would be to protect the Wawona Covered Bridge in “good” condition as defined by the LCS guidance. The management standard for the Wawona Hotel Complex is protection of 80% of the elements in “good” condition, and none in “poor” condition, as defined by the LCS guidance. LCS Conditions provide a consistent means to assess the condition of historic structures on a national basis. Condition levels are defined as follows:

### ***Adverse Effect***

An Adverse Effect would occur if either of the following situations developed: 1) The Wawona Covered Bridge condition diminished from “Good” to “Fair” using LCS definitions; or 2) Any of the individual buildings within the Wawona Hotel complex diminished to “poor” using LCS definitions.

### ***Degradation***

Degradation would occur if either of the following situations developed: 1) The Wawona Covered Bridge condition diminished from “Good” to “Poor” using LCS definitions, or if critical structure failures are allowed to continue without repair for a period of longer than six months; or 2) The condition of more than 50% of the buildings in the Wawona Hotel complex diminished from “good” or “fair” to “poor” using LCS definitions, or if critical structural failures were allowed to continue without repair for a period of longer than six months.

### ***Monitoring – List of Classified Structures***

The Park Historical Architect in concert with the Park Historic Preservation Specialist would periodically assess the condition of the Wawona Covered Bridge and Wawona Hotel complex and identify any critical structural system failures or weather impacts. Preservation and Cultural Resources Specialists who assess the structure and buildings must meet the qualifications outlined within NPS Director’s Orders 28.

Table 5-28 lists the trigger points and management actions related to the Wawona Covered Bridge and the Wawona Hotel Complex.

**TABLE 5-28: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR THE WAWONA HISTORIC RESOURCES (LIST OF CLASSIFIED STRUCTURES CONDITION ASSESSMENT)**

<b>Trigger Point(s) at Which Management Action Would Be Taken</b>	<b>Possible Management Actions</b>	<b>Rationale for Management Actions</b>
Damage or deterioration of 5% or more individual buildings or that results in an LCS condition assessment of “fair”	<ol style="list-style-type: none"> <li>1. Increase the frequency of condition assessments for buildings and structures in “fair” condition</li> <li>2. Develop prioritized list of preservation actions based on severity of deterioration (addressing deterioration at NHL buildings and structures first)</li> <li>3. Preservation maintenance or repair to arrest ongoing deterioration and reverse damage</li> </ol>	The rationale for taking action at this threshold is to ensure repairs are made to reverse damage or deterioration noticeable at the collective level, and prevent the condition of buildings or structures from deteriorating to a “poor” condition. These corrective actions should arrest any ongoing deterioration, and return at one or more of the buildings or structures to “good” condition.

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-28 above. A management concern is present regarding the number of buildings and structures that have a currently-assessed condition of “fair.” To address this concern, general and specific responses would be required. Generally, preservation maintenance and/or repairs would occur, in keeping with the Secretary of the Interior’s Standards for Treatment of Historic Properties (NPS 1995), sufficient to return all of the NHL elements to “good” condition, and to arrest ongoing deterioration of other elements. Additionally, the following specific measure would be implemented to address this management concern:

- Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to bring the Clark Cottage to “good” condition.

### ***Management Considerations and Enhancement Actions***

Management considerations related to the Wawona Historic Resources ORV would target improving the condition of contributing elements of the buildings that are currently in “poor” condition and maintaining the condition of buildings and structures that are currently in “good” condition:

- Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in “poor” condition at the Main Hotel, Manager’s Cottage, and Annex Building.
- Regular and routine preservation maintenance, conducted in accordance with the Secretary of the Interior’s Standards, to ensure that this upkeep protects the historic character of the buildings
- Periodic rehabilitation will involve subject-matter specialists in planning, design and implementation to ensure actions do not compromise the historical integrity of the complex
- Concessioner operations will ensure that any operational modifications or updates are appropriate and in keeping with the historic character of the complex

### ***Conclusion: Protecting and Enhancing ORV 14 (Wawona Historic Resources)***

The Wawona Historic Resources ORV is absent of adverse effects and degradation. A management concern is present, as are some management considerations; NPS will follow the recommendations of the recent historic structures report for the Wawona Hotel to correct these problems and return the ORV condition to the management standard. To prevent future impacts, the NPS will monitor the condition of the ORV, and take specific actions should conditions exceed trigger points. Trigger points are selected to inform managers well in advance of adverse effects or degradation impacts on the bridge and hotel complex.

## **SCENIC ORVs**

This section describes the program to protect and enhance each Scenic ORV as proposed in the *Merced River Plan/DEIS*. Four Scenic ORVs exist in the Merced River corridor, each related to specific segment(s) of the river (Table 5-29).

**TABLE 5-29: SCENIC ORVs AND ASSOCIATED INDICATORS**

ORV Number and Key Resource	Segment(s)	Indicator to be Monitored through Time
15. Scenic Views in Wilderness	1	No indicator is proposed, as Wilderness designation precludes development.
16. Iconic Scenic Views in Yosemite Valley	2	Application of the Visual Resource Management System
17. Scenic Views in the Merced River Gorge	3	Application of the Visual Resource Management System
18. Scenic Wilderness Views along the South Fork Merced River	5	No indicator is proposed, as Wilderness designation precludes development.

## Scenic ORV—Scenic Views in Wilderness

**ORV 15—Visitors to this Wilderness segment experience scenic views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks.**

**Location:** Segment 1 (Merced River above Nevada Fall)

**Rationale:** Starting at the headwaters, the Merced River passes through chains of paternoster lakes, enters the upper montane forest, and becomes walled in by a classic U-shaped glacial valley. Scenic landmarks visible from the river or its banks include Washburn and Merced Lakes, Echo Valley, Bunnell Point, and Little Yosemite Valley. The long river segment of great visual variety and its uncompromised natural setting provide diverse, exceptional scenery—all with the river in the foreground.

**Management Objective:** The NPS will focus efforts primarily on development in the river corridor. While visitor density or encounter rates can affect one's ability to appreciate scenery, visitor use is more appropriately addressed by the Recreation ORV. Similarly, bare soils and river bank erosion can affect foreground views, but are better addressed by the Biological ORV. This high country segment is also susceptible to regional air quality impacts, so the NPS will participate in regional efforts to reduce air pollution. Human activity contributes only to highly localized air quality problems. The NPS would maintain the visitors' ability to experience and appreciate the Scenic ORV by providing a river corridor that is relatively free of development.

### *ORV Condition at the Time of Designation (1987)*

The river and its tributaries flowed through glacially-carved landscapes with very few human-made features, and the scenic ORV was largely unaffected by human activities. The river corridor and adjacent lands were located in protected Wilderness, with the exception of the Merced Lake High Sierra Camp, which was established in the early twentieth century. A recreational trail, initially developed in the 1930s, follows the river corridor as far as the Lyell Fork, then continues up Red Peak Fork. The trail includes wooden foot bridges at multiple locations. Backpackers campgrounds existed at Little Yosemite Valley, Moraine Dome and Merced Lake. A historic ranger station existed, just off the trail, a short distance upstream from Merced Lake. The landscape was otherwise comprised of natural features such as granite rock formations, meadows and forests.

### *Current ORV Condition*

Views from the river and trails along this segment are valued for their isolation from the developed world, their ecological integrity and Wilderness qualities. Trail conditions and opportunities for visitor access remain the same as in 1987. Scenic vistas can sometimes be obscured by regional air pollution, which is manifest in occasional haze during the summer months (NPS and Colorado State University 2002). Local wild and prescribed fires sometimes limit the visual range from higher elevations and vistas or views located within the

river corridor. Existing conditions include rustic structures, trails, footbridges, utility buildings and tents at the historic Merced Lake High Sierra Camp, and primitive campsite development in Little Yosemite Valley.

### ***Management Program for ORV 15***

Because Segment 1 is classified as a wild segment and the river corridor—aside from Merced Lake High Sierra Camp—includes designated Wilderness, no further development or resource extraction can occur and scenery will remain unimpaired in perpetuity. Management standard, adverse effect, and degradation are not defined for this ORV because it is essentially impervious to intended human activities, and any structures proposed in the Wilderness would be subject to the Minimum Requirements Analysis (MRA), as well as the contrast analysis discussed below under ORV 16. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*. The NPS will continue to participate in regional efforts to monitor air quality throughout the park. Because of the ambient nature of air quality, it cannot be managed exclusively for the river corridor.

### ***Management Considerations and Enhancement Actions***

Management considerations regarding this ORV pertain to the Merced Lake High Sierra Camp. The NPS will ensure that Merced Lake High Sierra Camp is maintained in a clean and tidy condition. If the camp remains, as proposed in Alternatives 5 and 6, the NPS will ultimately replace the tent fabric with colors that blend within the landscape, such as gray, brown or green, so as to reduce contrast (the tents are currently white canvas). These changes, as well as any other structures proposed at the camp or elsewhere in Segment 1, would be expected to blend quite well with the native landscape. The extent to which the proposed structure would blend with the native landscape would be assessed using the Visual Resource Management system contrast analysis discussed below in ORV 16, with an allowable contrast rating of only 4 or less (the discussion under ORV 16 provides a lengthy explanation of the contrast analysis; this number indicates that the structure must have very little contrast with the surrounding landscape). If the camp is removed, as proposed in Alternatives 2, 3, and 4 (with a temporary pack camp remaining in Alternative 3), the site would be restored to natural conditions and added to the Yosemite Wilderness. There will be no visual resource contrasts.

### ***Conclusion: Protecting and Enhancing ORV 15 (scenic views in wilderness)***

As a segment located almost entirely within protected Wilderness, except for the potential Wilderness addition at Merced Lake High Sierra Camp, the Scenic ORV for Segment 1 will remain wild and will not be affected by human activity. The NPS will not monitor visual resources or conditions at site-specific scenic vista points. The ORV is determined to be in the protected state, as defined by an absence of adverse effects and degradation, although intermittent air quality concerns are present. The NPS will continue to participate in regional air-quality improvements and cooperate with state agencies to manage air quality.

## Scenic ORV—Iconic Scenic Views in Yosemite Valley

**ORV 16—Visitors to Yosemite Valley experience scenic views of some of the world’s most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls.**

**Location:** Segment 2 (Merced River in Yosemite Valley)

**Rationale:** The Merced River enters Yosemite Valley at Nevada Fall, flowing through Emerald Pool and then over Vernal Fall. Once in the flat valley, the Merced provides the foreground to many of Yosemite’s most famous landmarks. From the river or its banks, views consist of Yosemite Falls, Bridalveil Fall, El Capitan, Half Dome, and other named and unnamed parts of the cliffs and hanging valleys rimming Yosemite Valley. Meandering through a sequence of compound oxbows, wetlands, and meadows, the river and its related features provide broadened panoramas. Throughout Yosemite Valley, views from the river or its banks encompass the lower montane forest as it rises up to sheer rock faces of granite cliffs and talus slopes with a flat valley bottom serving as a contrasting foreground. The juxtaposition of granite domes and waterfalls is unique, as is the concentration of river-related views found in Yosemite Valley.

**Management Objective:** Segment 2 is the most highly accessible portion of the Merced River, visited by the greatest numbers of park visitors. Here the NPS provides the highest levels of service and accommodations for visitor use, and here the NPS has the greatest obligation to manage visual resources and visitors, and to protect and enhance the conditions that provide for the best possible viewing experiences. The NPS will remove unnecessary facilities from the river corridor and ensure that all future development satisfies objectives that provide low contrast ratings under the Visual Resource Management system analysis: form, line, color and texture. A Sense of Place: Design Guidelines for Yosemite Valley (NPS 2004) established architectural and site design guidelines that are intended to promote harmony between the built and natural environments.

Actions intended to manage natural resources may include the use of prescribed fire or controlled burns to thin forests that are encroaching on meadows; cutting trees, tree branches or other vegetation by mechanical means; and the application of herbicides to control invasive species. Related actions intended to protect the Recreation ORV would limit the number of visitors to lessen visitor density and congestion at attraction sites and make improvements to the transportation system that will reduce automobile congestion. The NPS will cooperate with regional authorities to reduce airborne contaminants caused by combustion, including carbon dioxide emissions, smoke caused by fire, particulate matter generated by construction, and to improve air quality conditions.

### *ORV Condition at the Time of Designation (1987)*

Multiple scenic resources and natural landmarks are visible from the river corridor. Scenery was a key reason why Yosemite Valley was set aside as a national park (GMP EIS draft 1978, Olmsted 1865). Numerous roads, buildings and other features were developed with scenic resources in mind (SVMP 2011, DuBarton 2007, Davis 2004, Carr 1998). In the late 1970s, the NPS conducted an assessment for the General Management Plan (GMP) to determine existing and historic viewing conditions and to identify the prominent landscape features in Yosemite Valley (NPS 1980). The most prominent features noted were Half Dome, Yosemite Falls, El Capitan, Bridalveil Fall, Three Brothers, Cathedral Rocks and Spires, Sentinel Rock, Glacier Point, North Dome, Washington Column, and Royal Arches. Other important scenic resources that could be seen from within the Merced River corridor include: Nevada, Illilouette, Vernal, and Ribbon falls; the cliffs at Yosemite Point and Lost Arrow Spire; and the scenic interface of river, rock, meadow, and forested valley floor. Existing viewpoints were identified along with historic viewpoints of paintings and photographs, and the quality of their views and their proximity to roads and trails were noted.

### ***Current ORV Condition***

Views from the Merced River corridor, roadside locations, trails and vista points continue to retain high aesthetic value. The built and natural environments have changed subtly since the river was designated as Wild and Scenic. Some structures were damaged by flood or rock fall and removed over time. Meadow and riparian conditions are affected by encroaching vegetation and exotic species, park visitation patterns fluctuate, and conditions at scenic viewpoints are variable.

The 1997 flood caused a general reduction in buildings and facilities that were previously located in the Merced River floodplain. Curbing was installed along Northside and Southside Drives to limit the numbers of cars that could be parked in the foreground of scenic resource views. The Yosemite Falls project removed idling buses from views of the falls.

The NPS protected and restored meadows by removing obsolete or abandoned utility lines, removing non-native vegetation and encroaching conifers, planting and re-establishing native vegetation, constructing meadow boardwalks, and implementing monitoring programs. Direct views of meadows have improved, as have the importance of meadows in foreground views toward prominent scenic assets. However, river bank erosion and vegetation trampling associated with visitor access to river points continues to detract from visitor use and enjoyment of park scenery.

The Scenic Vista Management Plan for Yosemite National Park Environmental Assessment (NPS 2010a) described vegetation changes that have intruded on scenic viewpoints, rated and ranked the quality of viewpoints, and defined limits on management actions based on ecological conditions. The *Scenic Vista Management Plan* (SVMP) prioritized sites based on a visual resource assessment (NPS 2009a, 2009b). Descriptions of these vista points, assessment results for sites within the Merced River corridor and for sites that provide views of scenic landmarks, views of the river and river-dependent resources are provided in *Scenic Vista Management in the Merced River Corridor* (Appendix H). The assessment includes recommendations for vegetation management actions that would improve scenic views. Views of scenery are commonly hampered by encroachment of conifers on meadows and in certain cases by exotic species. Scenic vistas can also be obscured by regional air pollution, which results in occasional haze during the summer months (NPS and Colorado State University 2002).

### ***Management Program for ORV 16***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program.

#### **Indicator—Application of the Visual Resource Management System**

The NPS will apply the Visual Resource Management (VRM) system developed by the U.S. Forest Service (USDA 1995) and further refined by the Bureau of Land Management (BLM 2007) (Table 5-30) to monitor this ORV. The VRM system has been used for over three decades and has proven to be a process that can articulate and document conditions that viewers consider inappropriate to the natural environment (Galliano 2000). VRM classifies landscapes on a scale from I to IV, with Class I denoting landscapes that merit the highest order of protection for natural scenery. Classes II through IV allow increasingly larger amounts of landscape modification. A final category (V) is sometimes used to describe a landscape that is altered to the extent that it cannot be classified or managed for natural scenic qualities.

**TABLE 5-30: VISUAL RESOURCE MANAGEMENT (VRM) SYSTEM**

<b>Wild and Scenic Rivers Act (WSRA)</b>	<b>BLM Visual Resource Management (VRM) System Classifications (BLM 2007)</b>	<b>USFS Visual Management System (VMS), Visual Quality Objectives (USDA 1995)</b>
Wild: Free of impoundments, generally inaccessible except by trail with watersheds or shorelines essentially primitive and waters unpolluted; vestiges of primitive America.	Class I Objective – Preserves existing character of the landscape and provides for natural ecological changes, but does not preclude limited management activity. Any changes in the landscape should be minimal and must not attract attention.	Preservation – Provides for ecological changes only. Management activities, except for very low visual-impact recreation facilities or actions, are prohibited. (Wilderness areas, primitive areas, other special classified areas and unique management units)
Scenic: Free of impoundments with shorelines or watersheds still largely primitive and shorelines undeveloped, but accessible in places by roads.	Class II Objective – Retains existing character of the landscape. Any changes in the landscape should be minimized. Management activities may be seen, but should not attract attention. Any changes must repeat or maintain basic elements of form, line, color and texture found in predominant natural features and characteristics of the broader landscape.	Retention – Provides for management activities or actions that are not visually evident. Activities may only repeat aspects of form, line, color and texture, frequently found in the characteristic landscape. Changes in qualities of size, amount, intensity, direction, and pattern should not be evident.
Recreational: Readily accessible by road or railroad, may have some development along shorelines, and may have undergone impoundment or diversion in the past.	Class III Objective – Partially retains existing character of the landscape. Any changes to the landscape should result in moderate differences. Management activities may be noticeable but should not dominate views. Any changes should repeat the basic elements found in the predominant natural features of the landscape.	Partial retention – Management activities or actions remain visually subordinate to the characteristic landscape. Activities and actions may repeat the visual aspects of the characteristic landscape, but changes in the qualities of size, amount, intensity, direction or pattern remain subordinate to the characteristic landscape.
Areas not designated	Class IV Objective – Provides for management activities that result in major modifications of the existing landscape. Changes in the landscape may be significant. Management activities or actions may dominate views or become a focus of viewer attention. Every attempt should be made to minimize the impact of activities or actions through careful location, minimal disturbance, and repetition of basic elements.	Modification – Management activities or actions may visually dominate the original characteristic landscape. Activities of vegetative and land form alteration must borrow from naturally established form, line, color or texture so completely that visual characteristics are those of naturally occurring features of the surrounding area of the same character type. Component parts of these activities (structures, roads, slash, root wads) must remain visually subordinate.
Areas not eligible for designation	Class V – Development or other landform changes predominate; the natural landscape is compromised to the extent that it can no longer be managed for natural scenic qualities.	Maximum Modification – Management activities and landform alterations may dominate the characteristic landscape. Background views must be those of natural occurrences within the surrounding area or character type. Foreground and middle-ground areas may not appear consistent with the characteristic landscape. Alterations may be out of scale or contain detail that is incongruent with natural occurrences in foreground or middle-ground.



There are two steps involved in the application of VRM system: an inventory of the existing landscape and an analysis of the contrast of a potential structure with the affected landscape. The inventory is required to classify current conditions and develop a baseline for comparison over time. In the initial inventory, visual resources and landscapes are qualified through surveys and documented from places or points that provide optimal viewing experience from visitors. River access points and the river itself will provide the primary points of reference for viewing experience and evaluation (the park's *General Management Plan* used historic photographs and landscape paintings to identify the best locations for viewing scenery) (NPS 1980).

Within the context of the Wild and Scenic Merced River, the VRM landscape classification is determined by the river segment designation of Wild, Scenic or Recreational. As presented in Table 5-30, there is a natural parallel between wild and scenic river classifications and VRM classes.

As indicated above, these classifications determine management goals for the protection of scenic areas. The VRM analysis proposed for this indicator also considers naturally-occurring landscape changes (such as fire or rock fall) and cumulative management actions over time.

The contrast analysis is done on proposed developments to ensure the degree of contrast is acceptable for the given landscape class. "Contrast" refers to a difference between the key components of a landscape (form, line, texture, and color, of both the landscape's vegetation and also its land and water) and the same components of the proposed structure. The contrast analysis is systematized, yielding a documented and quantified result ranging from 0 to as high as 36. Higher scores indicate a higher level of potential contrast between the proposed action and the existing surroundings; lower scores indicate that a proposed structure can be said to blend in (or not distract from) and thus preserve the surrounding landscape and its VRM landscape class rating.<sup>34</sup>

For the monitoring program, the contrast analysis will be performed using photographs from vista points. The acceptable contrast varies by landscape class, with those at higher levels (classes III and IV) accommodating a higher level of possible contrast. The analysis will be further refined as the total area of visual human impact is determined and scores are calculated as a percentage using the photographs taken or captured from other points.

### ***Management Standard***

The management standard is defined according to river segment classification, with scenic segments meeting VRM Class II definitions and the recreational segment meeting VRM Class III definitions.

### ***Adverse Effect***

Scenic river segments managed as VRM Class II would be adversely impacted if human constructions or actions resulted in the segment falling into VRM class III management class. The recreational river segment managed as VRM Class III would be adversely impacted if human constructions or actions resulted in the segment falling into VRM Class IV management class.

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<sup>34</sup> While scores have some subjectivity, variations in scoring between scorers decline with user training and experience (NPS 2009). For example, the NPS in the Blue Ridge Parkway has used this system using large numbers of volunteers to assess scenic value and monitor change over time. Using those results, park managers have been able to successfully communicate the need of adjacent land owners to modify developments to reduce the possible contrasts with the native landscape. Results were also introduced in a 2008 lawsuit case against Tennessee Valley Authority and cited by the judge in the ruling to justify requirements for three coal plants to operate above Clean Air Act standards (NPS 2009).

### ***Degradation Standard***

Scenic river segments would be degraded if human constructions or actions resulted in the segment falling into VRM class IV management class. Recreational river segments would be degraded if human constructions or actions resulted in the segment falling into VRM class V management class.

### ***Monitoring ORV 16 — Iconic Scenic Views in Yosemite Valley***

An inventory of the Merced River corridor has not yet been performed, but will be no later than the completion of the *Merced River Plan/FEIS*. As noted above, the inventory will classify current conditions and develop a baseline for comparison over time.

Monitoring will occur every four years after completion of the inventory to ensure that any new or modified structures preserved the segment within the management class rating. Further, any new structures or modifications of existing structures would be subject to the contrast analysis as described above. Table 5-31 describes the triggers and mandatory management actions that would take place should the contrast analysis reveal that a proposed structure, or modification thereof, would unacceptably contrast with its native landscape. Acceptable contrast ratings for the scenic river segments in the Merced River corridor are 0-12 with no strong contrast, and acceptable contrast ratings for the recreational segment are 0-21 with no more than two strong contrast ratings per feature.

**TABLE 5-31: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR ICONIC SCENIC VIEWS IN YOSEMITE VALLEY (VISUAL RESOURCES MANAGEMENT)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
Planned construction of any new structure or exterior modifications to any existing structure	Contrast analysis	The contrast analysis is intended to reveal effects on the outstandingly remarkably scenic value before a new structure is built.
A moderate contrast rating in any category of within the Scenic river segment, or a strong rating for Recreational.	Mitigation, such as change in color, for any a proposed action should be considered. Reductions in the area of visual impacts would occur such as removing signs or other non-historic structures, or reducing temporary impacts.	Actions or structures within this segment should attempt to minimize the contrast to the surrounding landscape to the best extent possible.
Within the Scenic river segment, an overall contrast rating greater than 12, or a strong contrast in any category. In a Recreational segment a contrast rating of 21 or more with two strong contrasting categories.	Mitigations to reduce the contrast rating, or an alternative location found if no mitigation is practical.	A contrast rating above a 12 is beginning to attract more attention than is acceptable to the casual observer. A score over 21 begins to dominate the landscape.

### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-31. No management concerns are present because no structures are currently proposed for construction or modification in the corridor, though some may be when an alternative in this plan is chosen and implemented, whereupon contrast analyses will be performed on any structures proposed within the Merced River corridor.

## ***Management Considerations and Enhancement Actions***

Management considerations pertaining to this ORV include visual intrusions associated with human made structures in Yosemite Valley (including roads and traffic through meadows and the presence of certain visitor and administrative facilities in the river corridor), vegetation growth that has intruded on scenic viewpoints historically available to park visitors, and riverbank erosion, informal trails, and riparian vegetation that affect direct and foreground views of the river, river-dependent resources, and the peaks and walls rising above the river.

NPS will take the following actions to address these considerations:

- To meet WSRA requirements, the NPS will consider the presence of existing structures, major facilities and services provided for visitor use and will eliminate several structures and facilities. Common to all the alternatives are actions that will remove certain structures, such as pools, abandoned bridge footings and infrastructure and rip-rap from riverbanks; and to address denuded, eroded riverbanks through restoration techniques. Alternatives 2-6 in the *Merced River Plan/DEIS* propose modifications to many previously-developed areas or disturbed sites that are located within the river corridor. Some Alternatives propose development in undisturbed sites including a new Upper Pines Walk-in Campground, a dormitory at Yosemite Lodge, and east of Curry Village. Under Alternatives 2-6, campsites would be removed from a minimum 100-foot riparian setback in Yosemite Valley. Alternatives 2-6 consider a range of additional actions at campgrounds, ranging from removal of campsites from the 100-year floodplain to addition of campsites. Under some alternatives, permanent lodging units are proposed in Curry Village to replace units removed from the rock-fall hazard zone. Various modifications are proposed to formalize visitor parking at Yosemite Village Day-use Parking Area and in the vicinity of the Village Store. Alternatives 2-6 consider a range of options to address temporary concessioner employee housing at the Lost Arrow parking facility, Yosemite Lodge, Boys Town, and the Huff House area of Curry Village. Under some alternatives, the need for housing is reduced. Under other alternatives, temporary housing is replaced with permanent housing structures. The existing number of guest lodging units would be reduced at Housekeeping Camp under Alternatives 2-6. An overflow day use parking facility is proposed in west Yosemite Valley in Alternatives 5 and 6, and a campground in Alternative 6. This would be development in previously undisturbed sites. The VRM system will be applied with design guidelines to ensure that future development does not result in VRM scores exceeding 21.
- All alternatives propose a 150-foot riparian buffer, which would generally insulate the river from development and protect views from its bed and banks. Restoration efforts common to Alternatives 2-6 and the 100-foot riparian buffer would provide for the protection and enjoyment of scenery that is river related or river dependent.
- New development or re-development in Yosemite Valley would be designed to be compatible with historic districts and preservation of rustic architecture, using “*A Sense of Place: Design Guidelines for Yosemite Valley*.” These design guidelines are intended to promote harmony between the built and natural environments.

Additionally, NPS will proceed with implementation of the Scenic Vista Management Plan for Yosemite National Park Environmental Assessment (NPS 2010a). The SVMP initially assessed 83 vista points in the Merced River corridor. Fourteen of the 83 points have prominent views of the river in the foreground:

- Cathedral Beach Picnic Area from river terrace and the beach
- Ferry Bend Turnout from Southside Drive
- Sentinel Beach picnic area from the beach
- Swinging Bridge from the bridge and adjacent picnic area
- Sentinel Bridge from pedestrian sidewalks

- Housekeeping Bridge from the pedestrian bridge
- Stoneman Bridge from pedestrian sidewalks
- Clark’s Bridge from pedestrian sidewalks
- Happy Isles Bridge from the Happy Isles Loop Road
- Vernal Falls Footbridge from the pedestrian bridge
- Superintendent’s Bridge from the flood interpretive sign on the pedestrian bridge
- Devil’s Elbow from the beaches
- Hanging Valley and Bridalveil Fall from Northside Drive
- Valley View from Northside Drive

Another 33 scenic vista points occur within the broader river corridor, involving views of rock formations from the roadside, views from certain buildings or attraction sites, and views of meadows.

For these 47 vista points, NPS will implement the management treatments presented in Appendix H (all actions recommended by the SVMP but falling within the Merced River corridor are included in the *Merced River Plan/DEIS* and are no longer part of the SVMP). Primary actions to manage these vista points are mechanical thinning or removal of conifer trees. No management actions would occur at the other 36 vista points although they will be monitored over time.

### ***Conclusion: Protecting and Enhancing ORV 16 (Scenic Views in Yosemite Valley)***

The Scenic ORV for Segment 2 is absent of management concerns, adverse effects, and degradation, though management considerations exist, such as visual intrusions, vegetation growth and loss, and air quality impacts. The *Merced River Plan/DEIS* proposes a range of options to address specific concerns and considerations, including removal of unnecessary major facilities in the river corridor and protection and restoration of natural resources. To prevent these concerns, or others, from redeveloping, the NPS would monitor the condition of the Scenic ORV 16 by inventorying the Yosemite Valley landscape, performing contrast analyses on all new proposed structures, taking action to keep those proposed structures appropriate to VRM Class III for Segment 2A and VRM Class II for Segment 2B, and coordinating with regional air quality authorities. NPS will also implement recommendations developed by the SVMP including removal of conifers encroaching on meadows and vista points.

## **Scenic ORV—Scenic Views in the Merced River Gorge**

**ORV 17—The Merced River drops 2,000 feet over 14 miles—it is a continuous cascade under spectacular Sierra granite outcrops and domes.**

**Location:** Segment 3 (Merced River Gorge)

**Rationale:** Descending from Yosemite Valley, the river becomes a continuous cascade in a narrow gorge littered with massive boulders. Arch and Elephant Rocks and other landmarks rise above, all visible from the river or its banks. Dropping 2,000 feet in 14 miles, canyon walls rise steeply from the river and have many seasonal waterfalls cascading down to the river. Spring and fall bring special parades of colors, from redbuds and other plants warmly flowering in spring to bigleaf maples and other trees turning bright colors in fall.

**Management Objective:** Segment 3 is classified as a scenic reach of the river, fully accessible by El Portal Road, and will be managed to promote visitor enjoyment from the river, from roadside pullouts, and from the roadway itself. Any further development is precluded.

### ***ORV Condition at the Time of Designation (1987)***

El Portal Road was originally built on the edge of the Merced River as a connecting route between Yosemite Valley and the Yosemite Valley Railroad terminal in El Portal. Pullouts allowed for short and long-range views of the river and nearby rock formations. The river and Cascades Fall were visible from passing vehicles using El Portal Road or Big Oak Flat Road when entering or exiting the park. Some structures intruded upon views from within the Merced River corridor in the Gorge, such as the Arch Rock entrance station, Cascades Dam powerhouse, Cascades housing units, and Cascades Diversion Dam.

In 1987, the Cascade Diversion Dam and associated features, including the powerhouse building, were visible from the river and its bank. The dam spanned the entire river, with an intake structure on the right bank of the river, and the associated powerhouse was a short distance downstream. The dam was no longer in use, in a dilapidated state. The powerhouse building was still present, but no longer used to generate power, instead being used as a high voltage substation. Portions of the El Portal Road were visible from the river and its banks, particularly in the Cascades and Arch Rock areas, where the river gradient is less severe and the road is close to the river.

### ***Current ORV Condition***

El Portal Road and the underlying sewer main were severely damaged by the 1997 flood. Both were rebuilt soon thereafter, with road conditions updated according to contemporary safety standards. Rock walls and barriers were rebuilt in keeping with the historic character that existed before the flood and new walls were built in keeping with the historic character. Cascades picnic area was developed and river resources were subsequently restored. The dam was removed in 2004, with the historic powerhouse, Arch Rock entrance station and comfort station remaining in place today. The visual or scenic resources in the Merced River Gorge are largely unchanged from those present at the time of Wild and Scenic River designation.

The scenic quality in the area of the river at the Big Oak Flat Road-El Portal Road junction has significantly improved since NPS removed the Cascades Diversion Dam and associated features in 2004 and restored the river to free-flowing conditions. The powerhouse remains and continues to be used as a high voltage substation. The scenic quality in the vicinity of the dam returned to a natural condition within six years.

The SVMP evaluated only one scenic viewpoint at Cascade Falls. Views from the river and roads in the Merced River Gorge continue to have high aesthetic value.

### ***Management Program for ORV 17***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program.

#### **Indicator — Application of the Visual Resource Management System**

The program would use the same VRM system as described under ORV 16, which would apply the following definitions of management standard, adverse effect, and degradation.

#### ***Management Standard***

This segment has a 'scenic' classification, which is held to a Class II VRM standard.

Due to the rugged terrain of the gorge, inherent limitations on visitor use and facilities, and the established relationship between the river and El Portal roadway, significant changes are neither proposed nor anticipated. The gorge is subject to rock fall and scenery will evolve with natural processes.

#### ***Adverse Effect***

This ORV would be adversely affected if human constructions or actions resulted in the segment falling into VRM class III management class.

#### ***Degradation***

This ORV would be adversely impacted if human constructions or actions resulted in the segment falling into VRM class IV management class.

#### ***Monitoring Scenic Views of the Merced River Gorge***

Monitoring will occur every four years to ensure that any recommended mitigations and actions are within the management class rating.

#### ***Management Concerns and Protective Actions***

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-31. There are no management concerns present related to scenic values in the Merced River Gorge, Segment 3. No new development or landscape changes are proposed within the river corridor aside from minor improvements to existing roadside pullouts. The only changes in landscape, except for minor trail reroutes and life-safety upgrades, will occur as natural processes prevail over present conditions.

#### ***Management Considerations and Enhancement Actions***

Management considerations for this river value include overhead power lines, which are scheduled to be removed from the powerhouse to a point at Wawona Road, below the Tunnel View scenic area. Roadside turnouts will be added to the scenic ORV indicator monitoring program for future analysis and possible treatment.

#### ***Conclusion: Protecting and Enhancing ORV 17 (scenic views in Merced River Gorge)***

The scenic ORV for Segment 3 is absent of adverse effects, degradation, management concerns, and management considerations. To monitor conditions and protect or enhance scenic ORV 17 in the future, the NPS will inventory the landscape using the VRM system and perform a contrast analysis on any new development anticipated within the selected alternative. Segment 3, however, is unlikely to be affected by human activity in the future, due to the deep topography and rugged terrain of the Merced River Gorge and absent any needs to provide more facilities or visitor services.

## Scenic ORV—Scenic Wilderness Views along the South Fork Merced River

### ORV 18—The South Fork Merced River passes through a vast area of natural scenic beauty.

**Location:** Segments 5 and 8 South Fork Merced River, both above and below Wawona

**Rationale:** The South Fork Merced River in these stretches is largely inaccessible, with just a few trail crossings above Wawona and none below it. The scenery from the river or its banks is that of an undeveloped Sierra Nevada river valley, with views dominated by forest-cloaked hills, distant peaks, and an untamed river. These are some of the wildest views in the Sierra Nevada.

The landscape spanning wild Segments 5 and 8 includes distant, dramatic vistas of mountains and waterfalls and close, beautiful views of forests and gorges. Both segments are accessible only by foot, or by mule or on horseback.

**Management Objective:** The NPS will maintain primitive conditions in Wilderness areas adjacent to the river, within the river corridor and beyond. The NPS will continue to manage visitor use through the Wilderness permit system, and to manage vegetation through prescribed fire and controlled burning practices when necessary and appropriate.

### *ORV Condition at the Time of Designation (1987)*

No visual resource studies were conducted for these segments of the Merced River and none are planned. The wild segments of the South Fork Merced were largely natural and undisturbed at the time of designation, including no roads and few trails.

Scenery viewed from within the Merced River corridor above Wawona, in Segment 5, was limited primarily to views of the South Fork itself at trail crossings, and long range views from the trails to nearby ridges granite features such as Wawona Dome, and forests. Below Wawona, Segment 8 of the Merced River passes into an area of dense montane forest, with limited views of rugged mountains and steep canyons.

### *Current ORV Condition*

Views from the river, banks, and trails in the South Fork Merced River, both above and below Wawona, continue to have high aesthetic value, as they did at the time of designation. Three scenic viewpoints of the South Fork below Wawona, Segment 8, were identified by the Scenic Vista Management Plan. None have views of the river itself, but refer to the gorge and surrounding mountains. No scenic vista viewpoints have been identified in Segment 5, above Wawona.

Both segments are susceptible to regional air quality impacts. The rates of visitor use here are among the lowest in the park. Unlike Segment 1, no trail follows the river. Segment 5 is accessible only from a trail that crosses the river at a perpendicular angle and is not open to rafting. Segment 8 is not accessible by trail and is rarely visited by kayak. Scenic resources are primarily appreciated from a distance.

### *Management Program for ORV 18*

Because Segments 5 and 8 are classified as wild and the river corridor includes designated Wilderness, no further development or resource extraction can occur and scenery will remain unimpaired in perpetuity. Management standard, adverse effect, and degradation are not defined for this ORV because it is essentially impervious to intended human activities, and any structures proposed in the Wilderness would be subject to the Minimum Requirements Analysis (MRA), as well as the contrast analysis discussed above. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

The NPS will continue to participate in regional efforts to monitor air quality throughout the park. Because of the ambient nature of air quality, it cannot be managed exclusively for the river corridor.

### ***Management Considerations and Enhancement Actions***

There are no management considerations present in this Wilderness segment related to this scenic ORV. Project alternatives propose no changes in the river corridor.

### ***Conclusion: Protecting and Enhancing ORV 18 (Scenic Views along the South Fork)***

As a segment located almost entirely within protected Wilderness, the Scenic ORV for Segments 5 and 8 will remain wild and will not be affected by human activity. The NPS will not monitor visual resources or conditions at site-specific scenic vista points. The ORV is determined to be in the protected state, as defined by an absence of adverse effects and degradation although intermittent air quality concerns are present. The NPS will participate in regional air quality efforts and cooperate with state agencies to manage air quality.

## **RECREATIONAL ORVs**

This section describes the program to protect and enhance each Recreational ORV as proposed in the *Merced River Plan/DEIS*. Two Recreational ORVs exist in the Merced River corridor, each related to specific segment(s) of the river (Table 5-32).

**TABLE 5-32: RECREATIONAL ORVs AND ASSOCIATED INDICATORS**

ORV Number and Key Resource	Segment(s)	Indicator to be Monitored through Time
19. Wilderness Recreation above Nevada Fall	1	1. Wilderness Encounters
20. River-related Recreation in Yosemite Valley	2	1. Vehicles at One Time 2. Visitor Densities

### **Recreational ORV—Wilderness Recreation above Nevada Fall**

**ORV 19—Visitors to federally designated Wilderness in the corridor engage in a variety of river-related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the experience.**

**Location:** Segment 1 (Merced River above Nevada Fall)

**Rationale:** Wild segments of the Merced River and South Fork Merced River flow from the heart of the Sierra Nevada, with its towering granite peaks and impressive forests. The spectacular, rugged expanses along these segments provide exemplary landscapes for Wilderness experiences characterized by solitude, personal reflection, closeness to nature, independence, and self-reliance. Activities are oriented toward primitive travel, camping, exploration, and adventure.

Of the many exemplary recreational activities, a few are particularly distinctive. Hiking or backpacking close to the river gives visitors the experience of spectacular cascades that vary by season. In spring, visitors experience the sight, sound, and feeling of the powerfully crashing waters. In drier months, the beauty of delicate water plumes becomes the center of attention. Backpacking on a popular segment of the John Muir Trail offers access to a multi-day Sierra Nevada Wilderness trip that is internationally renowned for gorgeous riverside views, undeveloped settings, opportunities for solitude along the trail, and Wilderness camping near the river. Horseback riding is also popular in this segment.

**Management Objective:** Provide for high quality river-related recreational opportunities oriented toward Wilderness values of unconfined, self-reliant and solitude experiences in a setting that is consistent with the Wilderness character of the area.



### ORV Condition at the Time of Designation (1987)

The description of ORV 19 condition at the time of designation is broken into three subject areas: recreational activity participation, setting attributes, and recreational experience quality.

**Recreational Activity Participation:** The most common visitor activities within the corridor at the time of designation included hiking, backpacking, and lodging at the Merced Lake High Sierra Camp. Both day-use and overnight camping took place within the river corridor, and both dispersed and designated camping opportunities were available. Visitors could also stay in tent cabins at the Merced Lake High Sierra Camp, access restroom and shower facilities, purchase meals, and temporarily keep stock.<sup>35</sup>

As shown in Table 5-33 below, there were 170 daily Wilderness permits issued in 1986 from six trailhead locations for overnight Wilderness use in the Merced River corridor. While the permits identified park visitors' entrance points into the Wilderness, users were free to choose where they wished to recreate. Consequently, the amount of time permit holders spent in the Merced River corridor is unknown. Similarly, some park visitors could have entered the Wilderness from elsewhere and hiked out through the Merced River corridor as part of their Wilderness trip. As a result, Wilderness permit data provide only a limited indication of the actual extent of visitor overnight use for River Segment 1 (Fincher 2010).

**TABLE 5-33: TRAILHEAD QUOTAS PRIMARILY FOR MERCED RIVER WILDERNESS ACCESS**

Trailhead	Wilderness Permit Quota <sup>a,b</sup>
	# of People in 1986
Happy Isles (to Little Yosemite Valley)	35
Happy Isles (LYV Pass Through Access) <sup>c</sup>	10
Glacier Point (to Little Yosemite Valley)	25
Mono Meadow	15
Rafferty Creek	35
Lyell Canyon <sup>d</sup>	50
<b>Total</b>	<b>170</b>
<sup>a</sup> The Wilderness trailhead quotas were modified in the mid- to late 1990s. Identified trailheads are only those primarily providing direct access to the Merced River corridor Wilderness. <sup>b</sup> Quotas represent maximum number of people per day permitted. <sup>c</sup> "Pass Through Access" requires permit holders to hike through Little Yosemite Valley to camp further up river or elsewhere outside of LYV. <sup>d</sup> Generally, only a minor proportion of Wilderness visitors out of the Lyell Canyon trailhead will travel down to the Merced River corridor as part of their Wilderness trips. Visitors wishing to access the Merced River corridor from Tuolumne Meadows mostly use the Rafferty Creek Trailhead. SOURCE: Fincher 2010; NPS 2012a	

**Setting Attributes:** At the time of designation, the location of hiking trails and camping areas allowed park users close contact with the river. Other setting attributes included the park's Wilderness permit system, parking capacity at trailheads, and the availability of other transportation services to and from trailheads. Additionally, the recreational experience was influenced by the scenic value of the high-elevation landscape in this segment and by the river itself. The Scenic ORV section provides a description of these scenic values.

<sup>35</sup> The High Sierra Camps are potential Wilderness additions within the Yosemite Wilderness where lodging is operated by the park concessioner. Visitors with horses are permitted to board their animals at the camp's corral during their stay. However, very few visitors with horses stay overnight within this river segment.

**Recreational Experience Quality:** At the time of Wild and Scenic River designation, the river corridor in these segments provided Wilderness experiences characterized by solitude, personal reflection, immersion in nature, independence, and self-reliance. Although no formal surveys documenting visitor satisfaction, perceptions of crowding, or encounter rates had been conducted, the Yosemite Wilderness (which includes the river corridor) was one of the most highly visited Wilderness areas in the nation (NPS 2005b). Recreationists could expect to encounter other hikers as well as stock users, both on the trail and at some campsite areas.

### ***Current ORV Condition***

As with the condition at the time of designation, the current condition description for ORV 19 is broken into three subject areas: recreational activity participation, setting attributes, and recreational experience quality.

**Recreational Activity Participation:** Similar to Wilderness activities prior to designation, the most common visitor activities within the corridor are hiking, backpacking, stock use, and lodging at the Merced Lake High Sierra Camp. The area continues to see both day and overnight visitation. NPS has reduced the number of Wilderness permits given to visitors for the main access trailheads from 170 in 1989 to 130 under current conditions (Table 5-34), to protect park resources and Wilderness experiences. During the same time period (between designation and today), NPS also formalized the camping area at Little Yosemite Valley and constructed the composting toilet, again to protect park resources (especially water quality in the Merced River).

Table 5-34 displays what these trailhead quotas translate into regarding actual trail use above Little Yosemite Valley in 2010. Additionally, NPS instituted an interim Half Dome permit system in 2010 to manage the number of Half Dome hikers. This change may influence the length of stay and number of backpackers who use the Little Yosemite Valley Campground and the trail from Nevada Fall to Half Dome and Little Yosemite Valley.

**TABLE 5-34: TRAIL USE ABOVE LITTLE YOSEMITE VALLEY TO MERCED LAKE (2010)  
(WILDERNESS-BOUND HIKER TRAFFIC)\***

Month	Average People per Day	Total People per Month
July	31	952
August	34	1,063
September	23	677
October <sup>a</sup>	10	117
Season (July to September)	30	2,864
NOTE:		
<sup>a</sup> Use counts were taken from October 1 through October 12. SOURCE: NPS 2011a		
* As measured by automated counter data at the segment of trail from Little Yosemite Valley to Bunnell Cascade (which omits hikers hiking from the Echo Valley area to Merced Lake).		

**Setting Attributes:** The recreational experience in the river corridor is primarily influenced by the scenic value of the landscape in this river segment and by the river itself. The section on Scenic ORVs above (specifically ORV 16—Iconic Scenic Views in Yosemite Valley) describes the visual qualities that contribute to the recreational experience in the river corridor.

Based on trail/campground use and encounter rates, the majority of users are concentrated in the river corridor between Nevada Fall and the Merced Lake High Sierra Camp. As observed by actual observations from Yosemite staff in 2010, the average rate of encounters with other parties per hour along the Merced River corridor were: 1.9 parties per hour from Little Yosemite Valley Lewis Creek, and 0.63 parties per hour from Lewis Creek to the Lyell Fork (NPS 2011u).<sup>36</sup> Recreational opportunities in Segment 1 have been influenced by Wilderness permit allocations (described above), the Half Dome day-use permit system, and other transportation services to and from trailheads. Since 1987, problems with the Little Yosemite Valley Camping Area toilet have been remedied by installing a composting toilet facility that improved water quality in the area, but also impacted the wilderness nature of the segment by adding a permanent structure. Additionally, in the mid-1990s the Merced Lake Backpackers' Camping Area was converted from dispersed camping to a designated camping area away from the lake to protect the meadow and lakeshore quality. In 2001, the camping area's previous toilet sump and sewer line were also removed. The utility systems at the Merced Lake High Sierra Camp have also been upgraded.

***Recreational Experience Quality:*** A 2001 (Newman & Manning) study conducted at the Yosemite Valley and Tuolumne permit stations indicated that Wilderness users' experience is most negatively impacted by signs of other campers at campsites, encounters with other groups, and encountering stock.

Segment 1 continues to provide a diversity of recreational and educational opportunities in the Merced River corridor. These opportunities have not changed since the time of designation, with the exception that the trailhead quotas have been reduced in response to changing use patterns. The same total number of visitors still access the corridor, though they may access this segment from different locations. These findings, when compared to the findings regarding the condition of this ORV at the time of designation, suggest that visitors today are still able to obtain high quality recreational experiences where they are able to relax and obtain solitude.

### ***Monitoring Program***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program.

### **Indicator – Wilderness Encounters**

One of the components of the Recreational ORV of the Merced River is the opportunity for primitive and unconfined recreation, self-reliance, and solitude. Solitude is an enduring characteristic of a Wilderness experience (Lucas 1964). Expectations for solitude and actual numbers and types of groups encountered have been shown to have a measurable effect on the quality of visitor experiences (Newman and Manning 2002; Patterson and Hammitt 1990; Vaske et al. 1986).

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<sup>36</sup> This data is baseline reporting from 2010, representing actual encounter observations by RMS staff. Future evaluations will be made utilizing automated counters (herein referred to as indirect counts). The data reported here also represents the average encounter rate and is not evaluated as a percent of total time observed as is stipulated in the proposed standards. These data indicate that we might be approaching the management standard, but for alternative 2 only. Should Alternative 2 be adopted, and should indirect counts reveal that the management standard is being violated (or any of the triggers in Table 5-32), some or all of the management responses identified in Table 5-32 will be implemented to reduce encounter rates below the management standard for that alternative (two parties per hour).

The number of Wilderness encounters has been chosen by Wilderness managers as an indicator for the social setting. Encounters among groups have an effect on solitude and such field measurements are relatively easy to accomplish (Watson, et al. 1998). Researchers and managers have at times chosen to monitor the number of individuals encountered, rather than the number of groups, due to difficulties distinguishing individuals' affiliations with one another, especially in busy areas (Shelby and Heberlein 1986). However, where possible, documenting each group encountered as well as the number of people in the group would provide the most flexibility for subsequent analysis (Broom and Hall 2010).

Encounters are also an excellent way to assess use levels and density, which can affect other ORVs, such as the biological and cultural values identified for the Merced Wild and Scenic River. Although some studies have shown that there is a weak relationship between encounters and visitor perceptions of solitude and crowding (Graefe et al. 1984; Lee 1977; Stewart and Cole 2001), a more substantial body of literature supports the use of encounters as an indicator of solitude opportunities in Wilderness (Broom and Hall 2009; Graefe et al. 1984; Lee 1977; Manning et al. 2000; Stewart and Cole 2001; Vaske and Donnelly 2002).

### **Management Standard**

Table 5-35 shows the range of standards across trail sections in Alternatives 2-6 of the *Merced River Plan/DEIS*, which must be met 80% of the sampled time to be within the management standard (if exceeded more than 20% of the sampled time, the management standard for this ORV would not be met). As is clear, the management standard will vary both by trail segment and by alternative. The management standard varies because trail sections have different degrees of access, with use levels generally dropping by distance from trailheads. As capacities for the corridor will vary across proposed alternatives, the standards for this indicator will also reflect this variation. This threshold takes into account sections of trail that have high, moderate, and low use, which was demonstrated as being an effective sampling schema in a study of encounter rates in the Tuolumne Meadows area (Broom and Hall 2010). All of the proposed standards provide full protection of the ORV 20, while allowing for a range of management objectives across alternatives.

**TABLE 5-35: AVERAGE ENCOUNTER RATES (PER HOUR, 80% OF TIME) FOR MANAGEMENT STANDARDS BY TRAIL SECTION**

Trail Segment	Alt 1 (No Action)	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Little Yosemite Valley to Lewis Creek	-	2	3	3	3	4
Lewis Creek to Lyell Fork	-	1	1	1	1	1
South Fork Merced	-	1	1	1	1	1

In all cases, this standard would take the mean encounter rate with other groups per hour across all designated trail sections, with that rate being met within any given segment at least 80% of the sampled time. The encounter rates in this table reflect the fact that these trails are all beyond the typical day-hike distance, so most users are backpackers, those taking packstock trips, and High Sierra Camp users. Therefore, these rates are substantially below the management standards proposed in the *Tuolumne River Plan/DEIS*, where most corridor trails experience substantial day-hiker use in addition to overnight users.

The numbers selected as standards for this indicator reflect preferences found in other studies and trends of encounter rates on the selected trail segments in Yosemite. Collectively, these studies represent years of data collection on trails with varying levels of use, both in Yosemite and elsewhere (Broom & Hall, 2009; Broom & Hall, 2010; Pettebone, Meldrum, Leslie, King, & Meath, 2010; NPS 2010g; and Cole & Hall, 2008). The

selection of the management standard also considered the encounter rates on the Half Dome Trail and the trail section from Nevada Fall to the Half Dome Trail Junction, which represent areas of high visitor use (Pettebone et al. 2010).

### *Adverse Effect*

An adverse effect would be present under this ORV should the mean encounter rate exceed 12 parties per hour 20% of the sampled time, across all trail sections sampled within the corridor, is exceeded for three consecutive years. This point is evaluated as the mean encounter rate with other groups per hour across all designated trail sections.

This number takes into account the mean number of parties per hour found along the Wilderness section of the Half Dome Trail on permit days and group encounters along the Dog Lake trail during the 2010 field season (Broom and Hall 2010; Pettebone et al. 2010). This threshold is also consistent with management guidelines at Mount Rainier National Park for the standard for high-use climbing zones (Lah 2000). In the Merced River corridor, 12 encounters would be a “trigger” that denotes adverse effect. The level of adverse effect in the river corridor was determined through multiple years of indirect and direct sampling, use in other areas of the park, and the high use of adjacent trails (Pettebone et al. 2010), and also reflects visitor preferences in studies of high-use destination in Wilderness (Cole and Hall 2008).

### *Degradation Standard*

Degradation would be present under this ORV should a mean encounter rate exceed 20 parties per hour 20% of the sampled time across all designated trail sections in a river segment, for three consecutive years. This point is evaluated as the mean encounter rate with other groups per hour across all designated trail sections.

Degradation for Wilderness encounters is defined at the level at which visitors perceive crowding is beyond an acceptable level. Encounter rates above this level cause displacement of visitors and detract from the visitor experience (Cole and Hall 2008). Cole and Hall found that on moderate use level trails, visitors who identified themselves as encounter tolerant would begin to be displaced at 80 encounters with other parties per day (roughly 20 encounters per hour) (Cole and Hall 2008). This standard is based on observations from several years of encounter data in the Merced River corridor, as well as preferences from hikers in studies of Wilderness use in the Pacific Northwest (NPS 2010g, Cole and Hall 2008, Broom and Hall 2010; Cole et al. 1997).

### *Monitoring – Wilderness Encounters*

Several locations would be monitored within the Merced River corridor, representing varying levels of use along trails within the Merced Wild and Scenic River. A total of three to five trail sections would be monitored in Segment 1. Trail sections along the South Fork Merced River would be monitored for Segment 5. All sites would be monitored during the high-use season. High-use sections of trails would be monitored on annual basis, utilizing automated trail counters. As monitoring will only capture the use on these sections during the busiest season (from May through October), winter and shoulder season use will not be captured. Traffic numbers and wilderness permits indicate substantially less wilderness use within the corridor during that time. Actual encounters or direct counts would be collected on a five-year rotation at low use and moderate-use sites, or with more frequency, depending on trends or trigger points being reached. Direct counts would be conducted in the high-use sites as needed to ensure that there is no

significant downward trend to the level of an adverse effect. Pack stock are counted during actual counts and these numbers are taken into consideration when analyzing encounter rates. Table 5-36 lists trigger points and specific management responses that would take place should conditions reach the trigger points.

**TABLE 5-36: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR WILDERNESS RECREATION ABOVE NEVADA FALL (ENCOUNTER RATES)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> Individual trail sections (not the whole segment) demonstrate exceedence of management standard for given trail section more than 20% of the sampled time.	<ul style="list-style-type: none"> <li>• Increase sampling intervals at low-use and moderate-use sites for direct observation. Increase direct observation sampling interval at high-use trail sections.</li> <li>• Continue to disseminate information to visitors regarding alternative trails within corridor. Encourage visitors to hike during days and times of day at which lower encounter rates occur.</li> </ul>	To protect and assure that trail use is in compliance with our desired conditions, the NPS would gather additional information to determine that conditions are not trending toward adverse effects.
<b>Trigger Point 2:</b> Individual trail sections (not the whole segment) demonstrate exceedence of management standard more than 15% of sampled time for three consecutive years.	<ul style="list-style-type: none"> <li>• Make necessary changes in Wilderness quota system to better manage for opportunities for solitude.</li> <li>• Measures would be put in place that control visitor-use numbers at trailheads that are feeding to trail sections exceeding standards, including establishing day-visitor parking permits, and instituting changes to the shuttle system.</li> </ul>	Quotas control the amount of overnight use in the Wilderness segments of the Merced River corridor. This standard would assist in determining if the existing quotas provide sufficient opportunities for solitude.
<b>Trigger Point 3</b> All sections across the river segment exceed the designated standard more than 20% of the sample time for three consecutive years.	Establish day use permitting system for trailheads feeding trail sections that have exceeded standards. Make necessary changes in Wilderness quota system to better manage for opportunities for solitude. Institute hard closures of trailheads or parking as necessary to regulate use of Wilderness corridor.	If the management standard is exceeded for the segment level, and an opportunity for solitude is not provided, aggressive actions would be necessary to regulate the flow of individuals into Wilderness.

### *Management Concerns and Protective Actions*

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-36. There are currently no management concerns associated with this ORV.

### *Management Considerations and Enhancement Actions*

The list below is a summary of management considerations associated with this recreational ORV in Segment 1. Proposed management actions are presented immediately below each management consideration.

- Crowding at Little Yosemite Valley Camping Area impacts the Wilderness experience integral to the recreational ORV.

Alternatives 2 and 3 would reduce visitor use (thus crowding) at Little Yosemite Valley by converting the designated camping area to dispersed camping. Alternatives 2, 3, and 4 would reduce trailhead quotas at trailheads that lead to Little Yosemite Valley.

- High levels of use at the Merced Lake Backpackers Camping Area would affect the Wilderness experience integral to the recreational ORV in this segment.  
 Alternatives 2 and 3 would convert the camping area to dispersed camping. Under all alternatives, monitoring would continue for wilderness encounters as described in chapter 5, with actions specified that NPS would take to remedy any encounter rates that exceed standards.
- Merced Lake High Sierra Camp affects the Wilderness experience integral to the recreational ORV in this segment as it affects the undeveloped quality of Wilderness. Additionally, it has a visual impact on the scenery ORV.  
 Alternatives 2-5 consider options to reduce, repurpose, or remove the Merced Lake High Sierra Camp. When tents are replaced, the NPS would use fabrics that are either tan, beige, or light gray, so that the tents harmonize with their surroundings, thereby reducing contrast.
- Crowding at Moraine Dome Camping Area impacts the Wilderness experience integral to the recreational ORV.  
 Actions to address this consideration range from removal of Moraine Dome Camping Area (in Alternatives 2 and 3) to disperse use, to retention of this camping area as designated to concentrate use.
- High encounter rates on trails between Little Yosemite Valley and Merced Lake indicate that Wilderness experience integral to the recreational ORV in this segment could be experiencing negative effects, particularly on busy weekends. By addressing high levels of use and crowding at Little Yosemite Valley Camping Area and Merced Lake Backpackers Camping Area, a subsequent decrease in encounter rates on the trails is expected.  
 Alternatives to reduce encounter rates in this segment include reducing the Wilderness zone capacities in some alternatives from 25 to 100 people per day (current levels are 150 people per day). Also, implementation of the Half Dome permit system will control most day use in this segment.

### ***Conclusion: Protecting and Enhancing ORV 19 (Wilderness Recreation above Nevada Fall)***

Based on the analysis conducted for and represented in the Baseline Condition Report, the current condition of this ORV is at or above the management standard. Given the acceptable condition of this ORV, no actions to protect this ORV are necessary at this time. Some alternatives propose reductions in user capacity to reduce encounter rates and increase solitude in this Wilderness segment.

The *Merced River Plan/DEIS* proposes a variety of actions to address specific management considerations. To prevent these considerations and others from redeveloping, the NPS would monitor visitor encounter rates to ensure that they are not exceeding established standards. Should specific trigger points be reached, the NPS would be required to implement a series of specific actions to reduce visitor levels to an acceptable level. These actions increase in severity as the current condition ORV condition moves away from the management standard to ensure proper course correction and re-establishment of the management standard. These trigger points were selected to inform managers in advance of any adverse effects or degradation to this ORV.

## Recreational ORV—River-related Recreation in Yosemite Valley

**ORV 20—Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley’s extraordinary setting along the Merced River.**

**Location:** Segment 2 (Yosemite Valley)

**Rationale:** Every year millions of visitors from around the world come to Yosemite Valley to recreate in and along the Merced River. Well-known and iconic features such as El Capitan, Yosemite Falls, and Half Dome provide a dramatic backdrop shaping the experience of first-time and return visitors alike. Visitors realize these experiences through a wide variety of activities occurring in and along the river. Activities include active pursuits such as hiking, biking, swimming, floating and water play, climbing, camping, or fishing; creative pursuits such as writing, painting, photography, and other arts; and educational and interpretive pursuits such as attending ranger-led walks and programs. Social elements, such as group camping and picnicking, are integral to many activities, while others offer opportunities for solitude and reflection.

Overall, the Yosemite Valley segment offers a variety of outstanding opportunities for front-country river recreation for people of all ages and abilities. The Merced River in this segment allows people to immerse themselves in their surroundings, taking in the sights, sounds, and feel of the river and its dramatic backdrop. These experiences, in turn, relieve stress and promote connection to the natural world.

**Management Objective:** Provide for a diversity of high quality river-related recreational opportunities that allow visitors to directly connect with the river and its environs amidst the spectacular scenery of Yosemite Valley.

### *ORV Condition at the Time of Designation (1987)*

The description of ORV 20 condition at the time of designation is broken into three subject areas: recreational activity participation, setting attributes, and recreational experience quality.

**Recreational Activity Participation:** In 1987, recreational opportunities in the Yosemite Valley segment were similar to those currently available. The most common visitor activities in this river segment at the time of designation included sightseeing, scenic driving, day hiking, wildlife viewing, picnicking, floating, creative arts, camping, bicycling, nature study, rock climbing, and engaging in ranger-led programs. In 1987, both day-use and overnight camping were popular in this river segment. In 1987, a larger number of riverside campgrounds were available. As a result of the 1997 flood, some of these areas were damaged and closed.

**Setting Attributes:** Throughout the Yosemite Valley segment, the river has provided major visual attractions—such as Vernal and Nevada Falls—and the setting for visitor recreational experiences such as fishing, floating, and sightseeing. The natural hydrologic forces that result in periodic Valley flooding have also influenced the Recreational ORV by affecting visitor access and facilities.

**Recreational Experience Quality:** Since designation, Yosemite Valley has afforded a variety of opportunities to view scenery and to travel along and interact directly with the Merced River. Gramann (1992) reported that at or near the time of the Merced designation, visitors to the park had a relatively high level of overall satisfaction with 93% reporting that their experience was “very good” or better.<sup>37</sup> This study also looked at visitor evaluations of satisfaction specific to Yosemite Valley. In general, most summer visitors to Yosemite Valley in 1991 reported that the level of conditions and facilities in Yosemite Valley was either “the right amount” or “not enough.” Two exceptions to this were the amount of vehicle traffic and the number of people. In general, a significant number of respondents felt that there was too much vehicle traffic and too many people in Yosemite Valley. These two issues are indicators of the pervasive capacity issues related specifically to Yosemite Valley at the peak times of day during the park’s busy summer season.

<sup>37</sup> Gramann 1992 presents useful information about the condition of the ORV at time of designation, as the park visitation remained relatively stable between these years (3.2 million in 1987 and 3.4 million in 1991).



### Current ORV Condition

As with the condition at the time of designation, the current condition description for ORV 19 is broken into three subject areas: recreational activity participation, setting attributes, and recreational experience quality.

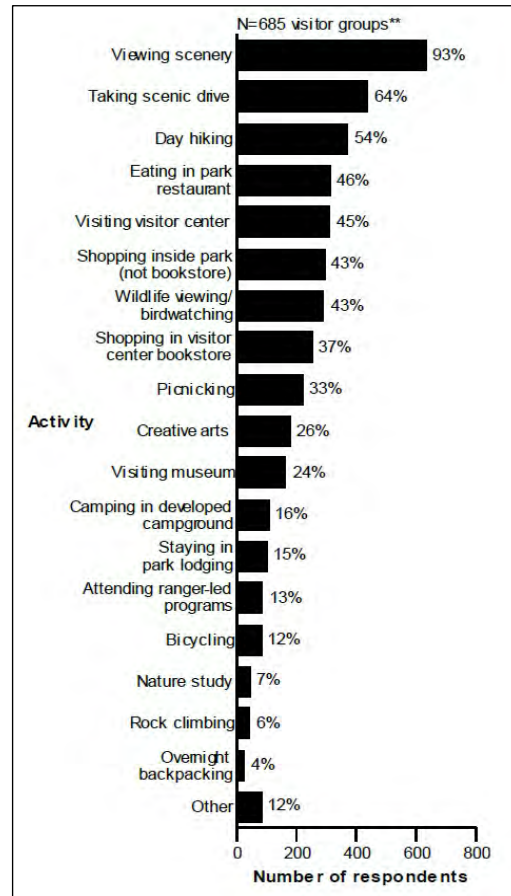
**Recreational Activity Participation:** Similar to 1987, the river corridor provides for a variety of opportunities to view scenery within Yosemite Valley and to travel along the river and interact directly with it. The most common visitor activities in the Yosemite Valley segment include scenic viewing, day hiking, wildlife viewing, picnicking, creative arts, camping, ranger-led programs, bicycling, floating, nature study, and rock climbing (Figure 5-3). Both day-use and overnight camping and lodging are available in this river segment. Campground sites in Yosemite Valley are in very high demand and often fill to capacity. Within Yosemite Valley, there are recreational opportunities available for visitors of all ages and ability levels. Visitors of all ages tour Yosemite Valley, with about one-fifth comprised of children and youth and 7% comprised of visitors 66 years or older. The uniqueness of Yosemite Valley attracts many visitors, who engage in a wide variety of activities.

**Setting Attributes:** While the flood of 1997 reshaped parts of the river corridor, the fundamental hydrological and setting components that attract visitors to the Merced River in Yosemite have changed very little since designation.

**Recreational Experience Quality:** In 2010, Yosemite Valley received approximately 3.56 million visitors (89% of total park recreational visitation during that year) (NPS Public Statistics Office). As part of the NPSwide Visitor Services Project, a survey conducted in summer 2005 recorded visitor perceptions of crowding and, in the absence of facility or visitor population changes, the study's findings may offer a reasonable representation of the 2010 conditions. Approximately 55% of the survey respondents reported feeling crowded by other visitors in Yosemite Valley (Littlejohn et al. 2006, Blotkamp et al. 2010). In a 2008 visitor survey, 40% of the park's winter visitors stated that they chose to visit Yosemite during the wintertime to avoid crowds (Le et al. 2008), providing another indication of perceived Yosemite Valley crowding.

The river and related attraction sites are focal points for visitor use and provide opportunities to experience Yosemite Valley's Recreational ORVs. Visitor perceptions of crowding were measured as part of several past visitor surveys (Manning 1998, 1999; White and Aquino 2008; Lawson et al. 2009).<sup>38</sup> While

**FIGURE 5-3: SUMMER VISITOR ACTIVITY PARTICIPATION (BLOTKAMP ET AL. 2010)**



<sup>38</sup> NPS is currently undertaking an additional river-specific use study during summer 2011, the results of which should be available late in 2012.

methodologies and results varied between these surveys, all of these studies found some perceptions of crowding among the visitors sampled. Notably, up to 80% of those sampled in one survey (regarding Bridalveil Fall) stated that they felt crowded during their visit (Manning 1998, 1999). Across these studies, that span more than a decade of research, all visitors surveyed reported a perception of crowding though the specifics of each of these studies varied depending on the visitor, place, and time of survey.

Currently, visitors to the Merced River in Yosemite Valley continue to report a relatively high level of overall satisfaction. According to the most recent visitor survey, most visitor groups (92%) rated the overall quality of facilities, services, and recreational opportunities at Yosemite National Park as “very good” or “good” (Blotkam et al. 2010).

### ***Management Program for ORV 20***

This section discusses the proposed management program for this ORV, including the indicator(s) to be used; the definitions of management standard, adverse effect, and degradation; and the monitoring program. A recent study of river recreational users suggests that crowding resulting from the current transportation system had the most negative effect on their recreational experience (Whittaker and Shelby 2012). If users are negatively affected in how they access the river, then this may directly impact their experience of this ORV. In other words, if visitors are not able to reach the river in an efficient manner to engage in their preferred recreational activities, then their experience of—and therefore the quality of—the recreational ORV is diminished. To monitor the conditions of this ORV, two distinct indicators will be used across a variety of settings in Yosemite Valley. The number of vehicles parked at one time in Yosemite Valley is the first indicator; this indicator will provide managers with information about users’ experience accessing the river. The second indicator will evaluate densities of people at iconic destinations known to be visited by most Valley visitors, as a way of understanding use conditions. This array of indicators is thought to be most effective in understanding the dimensions of Recreational ORV 20 that most, if not all, people would interact with while visiting Segment 2. This information can be compared to visitor perceptions of crowding at particular sites. The compilation of this evaluative social science data can be applied to further understand how visitor use is occurring along the river segment as a whole.

#### **Indicator 1 – Vehicles at One Time**

Transportation is considered an important part of the visitor experience in Yosemite and other National Parks (White et al. 2008), because it is the means of access to ORV 20. Sixty-four percent of summer visitors reported taking a scenic drive, and 11% considered it their primary activity while in the park (Littlejohn et al. 2009). Additionally, the Yosemite Valley transportation experience (perhaps the most-studied system in the national parks) is multi-dimensional, with three major roads terminating in Yosemite Valley. The experience can be influenced by travel times, parking availability, entrance station queuing, and a variety of other measurable experiential factors, most of which can be influenced by park management.

Vehicles at one time (VAOT) is the total number of vehicles on the ground at any one time in Yosemite Valley. This figure, along with parking utilization rates (the percentage of available parking spots occupied by vehicles), constitutes this indicator. Through both traffic volume counters and direct observation, this single indicator evaluates the total vehicles at one time in all river segments and compliance with authorized parking locations. Vehicles at one time would be assessed in two ways: 1) through automated traffic counters that factor inbound and outbound travel to the river segment; and 2) through direct observation of parking utilization, which would determine if parking is occurring at unauthorized locations.

This indicator builds from Yosemite Valley parking inventories conducted in 2004 and updated in 2011. Given the current configurations of the roadway and parking locations, daily accumulations of 5,000 vehicles arriving in east Yosemite Valley appear to provide for sufficient parking and manageable traffic circulation (DEA 2012). Parking availability for this level would meet supply if 5,091 spaces are available (total), with employee/administrative parking comprising 670 of those parking spaces. (The exact locations of formal parking outlined in the plan may change depending on which alternative is selected.)

This indicator would document any parking shortages during the busiest days of the year and determine management effectiveness in keeping overflow parking out of unauthorized, inappropriate locations. Additionally, vehicle accumulations will be documented for both overall Yosemite Valley and East Valley locations through an automated traffic counting system. To ensure consistency across alternatives, standards would be communicated through proportions of parking supply at peak hour. Monitoring sites will include a representative sample of parking locations and may occur during the most crowded times of the year. This sampling approach is consistent with scientific literature and allows the park to understand any variability in parking occurring at site specific levels (such as seasonal fluctuations to access river or climbing sites, etc.) while understanding its relation to larger Yosemite Valley vehicle accumulations.

### ***Management Standard***

Vehicles parked in east Yosemite Valley during the summer season would not exceed supply more than 10% of the time at peak hours (defined for this indicator as 10 a.m. to 4 p.m.) including the holiday weekends of Memorial Day, Fourth of July, and Labor Day.

### ***Adverse Effect***

An adverse effect would occur should the vehicles parked in east Yosemite Valley exceed the parking supply 25% of the time at peak hours, or a change of 20% in exceeding parking supply over a three-year sample period, including the holiday weekends of Memorial Day, Fourth of July, and Labor Day.

### ***Degradation Standard***

Degradation would be present under this ORV should vehicles parked in east Yosemite Valley exceed parking supply 50% of the time at peak hours, including the holiday weekends of Memorial Day, Fourth of July, and Labor Day.

### ***Monitoring – Vehicles at One Time***

The NPS would monitor vehicles at one time annually for the first three years of implementation. Implementation of the plan may change the configuration of the parking and the baseline for parking supply may have to be adapted to account for these infrastructure and associated behavioral changes. After three years of initial monitoring, it would take place every three years to detect change. This monitoring schedule would ensure that both segment-wide and site-specific information is gathered. Unauthorized parking that occurs in sensitive resource areas would be monitored, particularly during busier times of the peak visitor season. Table 5-37 lists triggers and specific management responses that would take place should conditions reach the trigger points.

**TABLE 5-37: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR RIVER-RELATED RECREATION IN YOSEMITE VALLEY (VEHICLES AT ONE TIME)**

Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
<b>Trigger Point 1:</b> For three consecutive monitoring periods, vehicles parked would not exceed parking supply 5% of the time between the hours of 10 am and 4 pm.	<ul style="list-style-type: none"> <li>• Increase monitoring efforts to further investigate vehicle volumes, parking, and travel time conditions.</li> <li>• Develop suggested itineraries to re-direct visitors to other areas of the park during systematic and empirically based diversions of vehicles at the El Capitan crossover.</li> <li>• Increase natural barriers, communication, and signage emphasizing compliance with endorsed parking locations.</li> <li>• Increase delineation of parking type (short-term and long-term) to ensure parking availability to a greater number of visitors but for shorter periods of time.</li> </ul>	Exceeding this trigger point routinely warrants further identification of the issue, or assurances that visitors are not parking in unendorsed locations.
<b>Trigger Point 2:</b> For three consecutive monitoring periods, vehicles parked would not exceed parking supply 9% of the time between the hours of 10 am and 4 pm.	<ul style="list-style-type: none"> <li>• Establish visitor day use permitting system for Yosemite Valley prior to the management standard is exceeded.</li> </ul>	If the management standard is exceeded for the segment level, parking is not available for the amount of vehicles being allowed into Yosemite Valley.

Traffic conditions as measured in 2011 from the Chapel Straight vehicle counter indicate that conditions are below the management standard, trending toward an adverse effect. For this one summer, parking exceeded endorsed parking 25% of the time between 10 am and 4 pm during the summer season (Memorial Day to Labor Day weekends) (*three* summers exceeding 25% of the parking supply would constitute an adverse effect). As discussed in more detail below, Alternatives 2-6 consider a variety of management responses to address this adverse effect.

## Indicator 2 – Visitor Densities

This indicator serves as a proxy for the quality of the visitor experience in the Yosemite Valley segment. Visitor densities refers to the number of people in a given area; it is a common measure for the degree to which the amount of use causes crowding or negative impact to aspects of a visitors' experience. Densities would be monitored at various locations depending on the activity type in the area (e.g. the number of people per area at a beach versus the number of boats at one time on the river). In some cases, two metrics would be implemented at the same location to ensure that accurate levels of use are captured, especially at more complex locations where use levels are high and a variety of different activities take place. The site locations have been chosen from many years of data collection and evaluation of the relationships between person densities at specific locations and overall use levels. Namely, the attraction sites of Bridalveil Fall and Yosemite Falls are iconic, visited by more than half (52% and 59% respectively) of all visitors to the park in the summer (Blotkamp et al 2010), and are documented to exhibit some of the highest levels of visitation in Yosemite Valley (Pettebone et al 2008).

The following definitions are important to the explanation of this indicator:

- **Person Densities:** Densities are a calculation of people or boats within a known geographic space displayed as X feet<sup>2</sup> per person. Not all locations have been measured spatially, so at one time counts are still used in those instances.
- **BAOT:** Boats at one time is the number of boats visible in a geographically defined section of the river at one point in time.

These measures have been chosen to reflect crowding and related recreational experience quality impacts at the key activity areas in and along the river. As such, they serve as proxies for the quality of the recreational ORV. Crowding, in terms of people or boats, has been shown to negatively affect a visitors' experience (Whittaker and Shelby 2010). To address this consideration, the use of at-one-time measures at popular destinations at specified intervals can give park managers a full understanding of the temporal and spatial use of the site. Normative research has found that an ideal site-crowding condition exists for visitors' recreational experiences and that these norms can help inform social indicators and standards (Manning et al. 1999; Shelby et al. 1983; Shelby et al. 1989). BAOT is commonly used as an indicator in river recreation (Hannon et al. 2002), and has been used to determine how many boats are on a larger (than the geographically defined area) river segment (Whittaker and Shelby 2010). BAOT has also been shown to strongly influence perceived crowding and encounter norms (Needham et al. 2011).

Two studies conducted in Yosemite Valley utilized normative research and compared the differences among attraction sites, forming the basis for the development of the at-one-time indicators in Yosemite, (Lawson et al. 2008; Manning et al. 1999). Research data were collected through a survey-based photo evaluation technique in which the visitor was presented with a set of images depicting different amounts of use at a given location (see chapter 6, part III). At-one-time measures like this collect data on visitor use in the same fashion, counting only individuals within the constraints of the area in the photo frame. These ways of quantifying visitor use levels allow us to correlate use levels across locations (Lawson et al. 2009). Management standards for this indicator have been developed based on the analysis of current use and previous research, both within Yosemite NP and in other like locations.

### ***Management Standard***

No more than three (50%) locations exceed their site level standard, provided in Table 5-38, 50% of the time for three consecutive years. This standard for social preference is based on peer-reviewed literature (Lawson et al. 2008; Manning and Lawson 2003) and professional judgment. Management would take action at those specific site level standards that are exceeded and/or increase segment-wide monitoring

### ***Adverse Effect***

An adverse effect would occur when four or more locations exceed their site level standard, provided in Table 5-38, 50% of the sampled time for three consecutive years. Management would take action at those specific sites that are exceeded and/or increase segment-wide monitoring. Adverse effect for social standards is based on peer-reviewed literature (Lawson et al. 2008; Manning and Lawson 2003) and professional judgment.

### ***Degradation Standard***

Degradation would be present under this ORV when four or more (66% of) locations exceed their site level standard, provided in Table 5-38, 80% of the sampled time for three consecutive years. Using the level of adverse effect and adjusting the percentage of time that this use level occurs, allows for visitor experience to remain at a specified level, until there is little opportunity for that experience to occur. Increasing the percentage of time that the standard is violated decreases visitor acceptability, leading to visitor displacement. Degradation for social standards is based on peer-reviewed literature (Lawson et al. 2008; Manning and Lawson 2003) and professional judgment.

**TABLE 5-38: SITE-LEVEL STANDARDS FOR THE RECREATION ORV AT-ONE-TIME AND PERSON DENSITY INDICATOR, COMPARISON ACROSS ALTERNATIVES**

Alternatives		1	2	3	4	5	6
		Current condition	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
<b>Visitor density indicators</b>							
Primary viewing areas / attraction sites	(ft <sup>2</sup> /person)	50	70	70	60	50	40
Vernal Fall trail	(ft <sup>2</sup> /person)	40	60	60	50	40	35
Multi-use trails / East Valley hiking trails	(ft <sup>2</sup> /person)	40	60	60	50	40	35
West Valley hiking trails	(ft <sup>2</sup> /person)	100	140	120	100	80	80
Shore use East Valley (High use)	(Linear feet / person)	10	20	20	10	5	5
Shore use East Valley (Medium use)	(Linear feet / person)	10	20	20	10	5	5
Shore use West Valley (Low use)	(Linear feet / person)	10	10	10	10	10	10
<b>Boating indicators</b>							
Boats at One Time: Stoneman Bridge to Sentinel Beach	BAOT per 400 feet	6	1	2	6	3	9
1. Standard: average cannot violate standard more than 10% of time between 10 a.m. and 4 p.m.							

**Monitoring – Visitor Densities**

All monitoring sites are located within Yosemite Valley segment 2 and are considered river dependent and related. The Vernal Fall trail site is a 50-meter section approximately 0.25 mile up the paved trail to the fall. The beaches at Devil's Elbow and Housekeeping East are two other sites, each of which would have one PAOT count. The Superintendent's River Section, still another sites, is monitored using a BAOT count. Each site has an area of a different size that is sampled, and each site has been geo-referenced so that the area of each site can be quantified in terms of the amount of area afforded to each person in that space. Additionally, the sites described above were chosen because they are Valley attraction sites and are important in determining the quality of visitor experiences in Yosemite Valley (Lawson et al. 2008; Manning et al. 1999). The trail sites also provide areas where counters can be utilized with greatest accuracy for predicting visitor-use estimates (Pettebone et al. 2010). Monitoring would take place on randomly selected sample days throughout the summer field season (defined as at least 10 days between Memorial Day to Labor Day weekends) annually. Table 5-39 lists segment-level triggers and specific management responses that would take place should conditions reach the trigger points.

**TABLE 5-39: MANAGEMENT ACTIONS AND TRIGGER POINTS TO MAINTAIN DESIRED CONDITIONS FOR RIVER-RELATED RECREATION IN YOSEMITE VALLEY (VISITOR DENSITIES)**

	Trigger Point(s) at Which Management Action Would Be Taken	Possible Management Actions	Rationale for Management Actions
	Two locations exceed their site level standard 10% of the time over a three-year interval between the hours of 10 a.m. and 4 p.m.	Increase monitoring interval. Educate visitors about crowding issues and inform them of alternate recreation opportunities.	To protect and assure that recreation use is in compliance with NPS target conditions, the NPS can gather additional information to determine that conditions are not trending toward the management target.
	Five locations exceed their site level standard 10% of the time over a three-year interval.	Permitting of affected areas (restrict east or west Valley). Segment-wide permit system.	To maintain the level of acceptable preferences, as reported by Lawson et al. (2008), management actions, such as education and outreach to the visitors, would help to maintain the level of use within the target condition.

### *Management Concerns and Protective Actions*

Management concerns occur when the condition of a resource has reached one of the trigger points identified in Table 5-37 or Table 5-39. As noted above, this ORV is not currently meeting the management standard, as indicated by the parking indicator. See the next section for a discussion of the actions proposed in the alternatives in this plan to address this situation.

### *Management Considerations and Enhancement Actions*

In addition to the management concern that is occurring, there are also several management considerations pertaining to this ORV. The list below presents these considerations, each of which is followed by a discussion of the actions proposed in this plan to address them. There are also actions proposed in this plan that would improve aspects of the visitor experience that affect recreation activities in the Merced River corridor, including actions affecting restoration of the natural and scenic setting, paddling and boating, camping, picnicking, and wayfinding. However, this analysis of the recreational ORV is focused on the management considerations and corrective actions that affect the measurable indicators, which are targeted to vehicles present at any one time and people present at any one time on trails, at attraction sites, in boats, and along riverbank sites. For this reason, the following list only includes actions that would affect transportation and visitor-use management in Segment 2.

- Throughout the peak summer season, significant delays in outbound traffic flow are experienced at the intersection of Northside Drive and Village Drive (Yosemite Village Day-use Parking Area intersection). Yosemite Village Day-use Parking Area, formally called Camp 6, is a six-acre dirt lot currently used to park a maximum of 517 vehicles on peak days, with the use of directed parking. Demand for visitor day parking exceeds supply during summer peak-use periods. This unimproved parking area, which is in the 5- to 10-year floodplain, has no design mitigations to protect water quality. In addition, it is a former meadow and is located in the channel migration zone. Some areas of the Yosemite Village Day-use Parking Area are constructed with fill, decreasing the extent of overbank flooding. To address this management consideration, Alternatives 2-6:

Consider options that range from locating the parking to the north of the road, to constructing a vehicle roundabout and a pedestrian undercrossing to address congestion of the intersection and pedestrian/vehicle conflicts.

Consider options that range from ecological restoration of the 10-year floodplain to restoration within a 150-foot buffer from the ordinary high water mark.

Consider parking capacity options that range from a lot with 550 to 850 spaces.

- Throughout the peak summer season, significant delays in outbound traffic flow are experienced at the intersection of Northside Drive and Village Drive (Yosemite Village Day-use Parking Area).

Actions at this intersection range from realigning this intersection to a proper four-way in Alternatives 2 to 4, to construction of a roundabout under Alternatives 5 and 6. Alternative 6 also considers an additional roundabout at Northside Drive and Sentinel Drive (Bank 3-Way).

- Demand for day-visitor parking exceeds supply during summer peak-use periods.

Alternatives consider different amounts of day use parking and related management actions. Some alternatives expand day use parking supply and alternative transportation, while others limit day use to levels lower than current demand.

Additional parking proposed across the alternatives is provided at an area west of Yosemite Lodge (Alternatives 2 and 4 would accommodate 150 spaces, Alternatives 5 and 6 would accommodate 300 spaces), West Valley (alternative 5 provides 100 parking spaces and alternative 6 provides 250 spaces), and at a remote parking lot in El Portal (200 spaces in alternatives 4 to 6).

- The shoulder of Sentinel Drive is used for overflow day-use parking. Sensitive habitat in this location is being trampled and destroyed.

Under Alternatives 2-6, roadside parking along Sentinel Drive would be removed and restored to natural conditions.

- Wilderness-related parking area was not designed as a formal parking area and therefore does not include Best Management Practices.

Under Alternatives 2-6, the Curry Village former landfill site at the Wilderness parking lot would be remediated and parking would be formalized in such a way that provides for proper drainage.

- Parking supply at The Ahwahnee is inadequate to meet overnight and day-visitor demand.

Under Alternatives 2-6, the existing parking lot would be redesigned and parking would be formalized to provide for proper drainage. Parking would also be expanded to the area west of the hotel to accommodate current demand and make up for the parking lost in the recent rock fall event.

- Crowding is common during peak season along the river and at popular attraction sites.

Crowding, as it pertains to the Recreation ORV in Segment 2, is managed through the day-visitor capacity management strategies outlined in Chapter 8. Not all actions are required in the current state of each alternative, but could be leveraged in the future of any alternative as directed by indicators and ongoing monitoring efforts. Specific actions as they apply to each Alternative are outlined in Chapter 8 and may include the following tools:

- Utilize parking and traffic management staff to improve parking efficiency and traffic flow in Yosemite Valley and other locations throughout the river corridor where needed. (This may include limiting day-use parking to West Valley overflow or diverting traffic to checkpoints throughout the park and at entrance stations.)
- Expand public transit to additional corridors and the Yosemite Valley shuttle to West Valley locations.
- East Valley day-use parking permits would be issued by advanced reservation and on a first-come-first-serve basis—checked at park entrance stations and secondarily at Valley locations or parking areas.



Visitors participating in boating and other river-based recreation activities have caused localized impacts to the riverbanks at the put-in and take-out locations (Cardno ENTRIX 2012). Additionally, local impacts to riverbanks have been caused by allowing easy access for non-boating visitors to sensitive riverbanks all along the river. The riverbank is highly eroded and widened at rafting put-in below Stoneman Bridge. Public comment also has indicated a desire to have more boating opportunities in the river corridor.

- Under all alternatives, swimming and waterplay are allowed in all segments, except short sections where noted in the Superintendent's Compendium due to health and safety risks. Private boating is by permit only in Alternatives 2-6.
- Alternatives range from private-use boating only to a combination of private and commercial use.
- Chapter 8 provides more detailed descriptions of the range of actions to address this management consideration under each alternative.

### ***Conclusion: Protecting and Enhancing ORV 20 (River-related Recreation in Yosemite Valley)***

Based on the analysis conducted for and represented in the Baseline Condition Report, the current condition of this ORV is below the management standard, with a management concern present. To return the condition of this ORV to the management standard, a variety of actions are proposed in Alternatives 2-6. The *Merced River Plan/DEIS* proposes a variety of other actions to address the management considerations pertaining to this ORV. To prevent these considerations, and others, from redeveloping, the NPS will monitor parking rates and vehicles at one time to ensure that they are not exceeding the management standard. Should specific trigger points be reached, the NPS would implement a series of specific actions to improve parking to an acceptable level. Similarly, should visitor densities begin to approach specific triggers, NPS would take steps to keep such densities within the management standard.

## **CONCLUSION**

Protecting and enhancing the river values will be accomplished through the means identified in this chapter. To ensure that visitation does not adversely affect or degrade those river values, the *Merced River Plan/DEIS* also specifies the user capacity of each alternative as well as the means by which those capacities will be enforced. This user-capacity discussion is the subject of the next chapter.

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## 6. VISITOR USE AND USER CAPACITY

This chapter is divided into three sections to describe how the following user capacity requirement of the Wild and Scenic Rivers Act (WSRA, Section 3(d) (1)) is addressed in the Merced River Plan:

*“...the federal agency charged with the administration of each component of the National Wild and Scenic Rivers System shall prepare a comprehensive management plan for such river segment to provide for the protection of the river values. The plan shall address resource protection, development of lands and facilities, **user capacities**, and other management practices necessary or desirable to achieve the purposes of this Act.”*

**Part I: Introduction and Background to User Capacity** includes definitions and background material for understanding how user capacity has been addressed in the *Merced River Plan/DEIS*. This section includes a list of “Frequently Asked Questions” to address common misunderstandings or assumptions about user capacities and to establish a basis for the technical components of the next two sections.

**Part II: Process to Address User Capacity** provides an overview and explanation of the process used to address user capacity in the *Merced River Plan/DEIS*. Each process step is explained in general terms here while the specific outcomes of each step are discussed in Part III.

**Part III: User Capacities** provides more detail about the specific user capacity decisions in the *Merced River Plan/DEIS*, organized by river segment. The content for each segment includes the relevant management goals and considerations to be addressed, selected indicators and standards, quantitative determinations of user capacities, and specific actions related to managing capacity.

### Road Map to User Capacity Information in the *MERCED RIVER PLAN/DEIS*

User capacity and visitor management information is provided throughout this DEIS. The following is a “road map” to user capacity topics or related information that is contained in the various plan chapters.

**CHAPTER 1: Planning goals** for the *Merced River Plan/DEIS* have been summarized in Chapter 1, the Merced Wild and Scenic River. These include capacity and visitor management goals from the 1980 General Management Plan (GMP) and those developed specifically for the *Merced River Plan/DEIS*. They provide overall direction to protect natural and cultural resource values, provide high quality visitor experiences related to the river, and address crowding and traffic impacts through a visitor management program.

**CHAPTER 2:** The **need for addressing user capacity** and some background on Merced planning litigation is summarized in Chapter 2, the Purpose and Need for the *Merced River Plan/DEIS*. More specific information about the capacity requirement in the WSRA is provided in Part 1 of this chapter. Chapter 2 also includes a summary of public involvement in the planning process, including a description of **public workshops focused on the subject of user capacity**.

**CHAPTER 3:** The *Merced River Plan/DEIS*’s **river segments** are defined in Chapter 3, Merced River Boundaries and Segment Classifications. These define the locations where capacities apply. River classifications help inform the kinds and amounts of use and support facilities that are appropriate for various river segments.

**CHAPTER 4:** The **Section 7 determination process** guides decisions pertaining to development within the bed and banks of the river.

**CHAPTER 5: River values** are defined in Chapter 5, River Values and Their Management. This chapter summarizes the process to protect and enhance the river’s values, and then defines the river’s free flowing condition, water quality, and segment-specific “outstandingly remarkable values.” For each value, the chapter summarizes **baseline conditions now and at the time of designation** and **management indicators and standards by alternative**.

**CHAPTER 6:** This chapter provides greater detail on the subject of user capacity than is found elsewhere in the document.

**CHAPTER 7:** Contains the **facilities and services analysis** that helped inform decisions in the plan regarding the appropriate types and levels of infrastructure and related visitor services.

**CHAPTER 8:** A **description of current management** or the “no action alternative” is provided in Chapter 8. Current management includes existing user capacities (e.g., for overnight accommodations, campgrounds, and backcountry use).

Management **actions to protect and enhance river values that are “common to all” alternatives** are also provided in Chapter 8. These include several restoration and infrastructure decisions that affect capacities (e.g., overnight accommodation levels, space available for parking, or transportation infrastructure development). Specific measurable limits on use that are common to all action alternatives are included in this section.

**Individual alternative descriptions** are provided in Chapter 8. These include information about user capacities by river segment for overnight, day and administrative uses throughout the corridor. This chapter also includes the various management actions that would be taken in each alternative to protect and enhance river values. Specific measurable limits on use that are unique to a particular action alternative are included in this section.

**CHAPTER 9: The environmental consequences of the alternatives** (which include user capacities) are provided in Volume II of the DEIS. These NEPA-based assessments are largely qualitative descriptions of environmental effects, but include some **quantitative analyses based on capacity decisions** (e.g., local economic impacts, meadow or riparian conditions, peak season densities at recreation attraction sites).

## PART I. INTRODUCTION AND BACKGROUND

The WSRA requires the National Park Service (NPS) to protect river values while allowing for recreational and other public use that does not “substantially interfere” with those values. The WSRA gives “primary emphasis to protecting the river area’s esthetic, scenic, historic, archeological and scientific features.” The *National Wild and Scenic Rivers System: Final Revised Guidelines for Eligibility, Classification and Management of River Areas* (Secretarial Guidelines) define “carrying capacity” in the context of a management plan to mean “the quantity and mixture of recreation and other public use which can be permitted without adverse impact on the resource values of the river area.”<sup>1</sup> Under the Secretarial Guidelines, public use should be regulated and distributed where necessary to protect and enhance river values. Public use may be controlled by limiting public access to the river, by issuing permits, or by other means available to the managing agency through its general statutory authorities.

The U.S. Court of Appeals for the Ninth Circuit has interpreted these mandates to mean that a comprehensive river management plan “must deal with or discuss the maximum number of people that can be received” in the river area, and that the NPS must “adopt specific limits on user capacity” that “describe an actual level of visitor use that will not adversely impact” river values.<sup>2</sup> The *Merced River Plan* has been developed to be consistent with WSRA and the Guidelines, as interpreted by judicial opinions.

As indicated by recent literature (Whittaker, Shelby, Manning, Cole, and Haas, 2010), user capacities have three basic components: units of use, location, and timing.

<sup>1</sup> Guidelines at 39459. WSRA and the Secretaries’ Guidelines use the terms “carrying capacity” and “user capacity” interchangeably.

<sup>2</sup> *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024 (9th Cir. 2008).

## Units of Use

In the *Merced River Plan/DEIS*, user capacities are organized into three major categories: 1) overnight use, 2) day use, and 3) administrative use.

**Overnight use:** This category includes people who stay in a campsite in the Merced River corridor, in one of the Yosemite Lodges or the Merced Lake High Sierra Camp, or who backpack in the Yosemite Wilderness. Overnight use levels are calculated as the maximum occupancy of all camping, lodging, and wilderness zones per night.

**Day use:** This category includes people who come for all or part of a day to sightsee, hike, or pursue other activities, spending the night outside the river corridor. Much of this use is concentrated in the Yosemite Valley and Wawona segments, although day users also visit wilderness segments that can be reached on a day hike from Yosemite Valley or Wawona. This category also includes people passing through on Highway 140 who make a brief stop at the roadside pullouts in the El Portal and Gorge river segments.

**Administrative use:** This category includes NPS, park concessioner, park partner, and volunteer personnel. Specific examples include trail crews, maintenance workers, resource protection staff, scientific research teams, commercial delivery drivers, and campground staff. Specific examples of concessioner uses include employees working at the hotels and lodges, visitor center, store, and food service outlets.

## Location

User capacities are location-specific and defined for specific river segments (and in some cases for smaller areas within segments, such as boating reaches). Areas where use levels are more highly concentrated in the river corridor include the following:

- The Merced River upstream of Nevada Fall, specifically the more concentrated backcountry use and overnight development found in the vicinity of the Merced Lake High Sierra Camp;
- Yosemite Valley, the most developed and high use area in the corridor, which has implications for use in other segments;
- Wawona, a small community with a concentration of use and development; and
- El Portal, a NPS administrative site and community with residential facilities, a hotel under private ownership, and other services that affect use in the Valley and elsewhere in the corridor.

## Timing

Timing for user capacities can also vary. For example, user capacities can be expressed in terms of the number of people per day, or annual visitation, or some other time period. In the *Merced River Plan/DEIS*, user capacities are expressed in terms of the number of “people at one time” (PAOT) during high use periods. This recognizes that peak use conditions for lodging, camping, roads, parking areas, viewing areas, or beaches are particularly important, and are different from total daily visitation (see below). These capacities ensure acceptable conditions during peak use times. By extension, they also ensure that lower use time periods, such as early or late in the day or during shoulder seasons will provide even lower use levels.

## User Capacities and Visitation

The park calculates and reports estimated visitation each year. Visitation estimates are based on traffic volumes, as recorded by automated vehicle counters at entrance stations, and assumptions about the number of people per vehicle. Trends in visitation are of interest to local gateway communities, the park concessionaire, and park managers because the number of people coming to the park each year directly affects local employment, business revenues and park programming. It is important to understand the relationship between user capacities (which are the focus of this plan), annual visitation estimates for a given capacity, and assumptions about the effects of varying use levels on river values. The following sections explain how these different measures are related.

**User Capacities:** Most user capacities for the Merced River Plan/DEIS are expressed as People at One Time (PAOT), defining the maximum number of people that can be received in the corridor at one time without adversely impacting or degrading river values, and without substantially interfering with public use and enjoyment of those values. These at-one-time user capacities have implications for overall visitation; they help determine the total number of people that access different segments throughout the course of a day.

**Visitation:** Visitation is an expected use level over a specified period of time (e.g. 24 hours), given a specified user capacity. Visitation levels are estimated on the basis of several assumptions that are verified by periodic monitoring. These assumptions include: (1) average number of people per vehicle; (2) average occupancy rates of various overnight accommodations; and (3) expected turnover rate of day-use parking spaces as people enter and exit the park during the course of a day.

## Visitor Use Patterns, Behavior and Impacts

User capacities and related visitation are based on assumptions about visitor use patterns and behaviors. These use patterns and behaviors have been studied and documented over a number of years (see for example, Manning et al. 1998; Manning et al. 1999; Lawson et al. 2008). These assumptions relate to whom and how many people visit the park, when they arrive, what activities they participate in, where they go, and how they behave. Because visitor use patterns and behaviors are well documented and generally predictable, each alternative anticipates likely impacts from different levels of visitation and balances facility improvements with other management actions (such as restoration or other mitigation) to protect river values and prevent unacceptable impacts. More intensive actions are generally needed to accommodate higher use levels.

### BACKGROUND ON USER CAPACITY

User capacity, or “carrying capacity” as it has traditionally been referred to, has a long history in natural resource management and has been applied to timber, rangelands, fish and wildlife populations, and recreation use. With philosophical roots that stretch back to Malthus’ population principle (1803) and Hardin’s “tragedy of the commons” (1968), capacities recognize that environments have limits and that ever-increasing use is likely to degrade conditions and become unsustainable. Applications of capacity in park and recreation settings followed rapid growth in outdoor recreation after World War II, prompting public concern over wild lands being “loved to death” (Wagar 1946; DeVoto 1953; Clawson and Held 1957). Focusing on the amount and type of use that recreation areas can accommodate without impairing their values, user capacity continues to play a fundamental role in the effort to protect high quality environments and experiences.

Several natural resource decision-making processes developed in the 1960s and 70s recognized the importance of capacities. The National Environmental Policy Act (NEPA 1969) provided the overarching planning framework for federal lands, ensuring that multiple uses and values were systematically addressed by developing alternatives and evaluating consequences. Several land management initiatives (e.g. Wilderness Act 1964), the Land and Water Conservation Fund Act (1964), the Wild and Scenic Rivers Act (1968), the National Trail System Act (1968), and the National Park and Recreation Area Act (1978) also addressed capacity or related issues. These initiatives encouraged increases to the supply of wildland resources for recreation while recognizing the need to manage the type and amount of recreation use to protect experiences and resources.

Research explored many ecological and experiential impacts in these settings, showing that some impacts may occur even with low levels of use. Deciding which conditions are desirable, how much impact is unacceptable, how use levels affect conditions, and how much use should be accommodated became the focus. To answer these questions, researchers recognized the importance of clear management goals and specific objectives for ecological, cultural, and experiential resources. Several researcher-developed planning frameworks identified specific terminology and steps that could be used to identify and manage impacts from recreation use. Although there are differences in orientation and emphasis among these processes, they all recognize potential trade-offs between different use levels, conditions, and management actions while providing high quality experiences (Whittaker et al, 2011).

User capacities are a common management tool used by many local, state, and federal agencies (Brown 2001), and the topic has been the focus of several national conferences, recent review papers (Whittaker et al., 2011; Graefe et al, 2011), and federal interagency task forces (Haas et al, 2002; Cahill, et al, 2012). Many managers have established capacities or considered them in their planning, even if they did not employ all of the steps or ideas in the researcher-developed planning frameworks. Capacities have been applied to protect natural, cultural, and experiential resources in diverse recreation settings (e.g., rivers, lakes, trails, backcountry areas, mountains, and islands); to help define the appropriate size and type of facilities (e.g., campgrounds, marinas, boat launches, transportation systems, and visitor centers); to shape the size of agency programs (e.g., interpretation, maintenance); and to determine appropriate levels of commercial and non-commercial uses. Several recent court rulings, including those for the Merced River Plan, have contributed to the evolution of capacity practices. In each case, rulings have set precedents, contributed capacity-related judicial doctrine, and helped clarify defensible and legally sufficient processes for capacity-related decision-making.

Adapted from "Capacity Reconsidered – Finding consensus and clarifying differences"  
by Whittaker, Shelby, Manning, Cole, and Haas (2011).

## Frequently Asked Questions About User Capacity

The following questions and answers address important user capacity issues that are commonly raised by stakeholders and the public. The purpose of this section is to help readers understand the key ideas that drive user capacity decisions in the *Merced River Plan/DEIS*.

### *Is user capacity intrinsic to an area, solely determined by resource characteristics?*

No. User capacities are an outcome of a decision-making process and part of a larger management program. They are the result of a series of judgments in the plan about the desired future environmental and experiential conditions. Capacity is not a single number solely derived from mathematical equations or calculations.

***What are “indicators” and “standards?”***

Indicators are variables selected to represent important ecological, cultural, or experiential conditions in a given setting. Standards define thresholds for those indicators, establishing the benchmark for acceptable conditions.

Establishing indicators and standards is an important step in addressing user capacity. For the WSRA, indicators are typically chosen to evaluate the conditions of specific river values. The *Merced River Plan/DEIS* identifies at least one indicator for each river value, to assess and monitor conditions. Some indicators are more related to visitor use impacts than others. For example, to assess the quality of recreational values in wild segments, park staff members monitor encounter rates, or the number of other people encountered along a trail per hour. This indicator is directly related to the amount of use occurring in this segment. However, water quality is more closely tied to point sources of contaminants, which may be linked to a number of variables other than visitor use. For more on indicators and standards, see Chapter 5.

***Do user capacities involve value judgments?***

Yes, several parts of the user capacity process involve decisions that include value judgments. While scientific inquiry can tell us a lot about the consequences of different choices, research cannot usually tell us what the “right” choices are. Research-informed judgments start at a general level when river values are defined. Other decisions feed into the development of management objectives for the types of visitor experiences to be provided and the development of acceptable standards for river value conditions. Judgments are implicit in the combination of management actions included in each alternative.

***How do biological values relate to user capacities?***

Some biological conditions may be sensitive to the amount of use, in which case they may be the limiting factor in determining capacity. Most often, though, biological conditions are more related to the *type of use occurring* and *how it is managed*. For example, a trail crossing a sensitive meadow could be vulnerable to widening more by stock than by human foot traffic. In this situation, the type of use would have more of an effect on the trail condition—and the associated meadow—than the amount of use. Such a problem could be remedied through trail construction, building a trail that can withstand packstock use. In such cases, the limiting factor for capacity may be some other factor such as kind of use, transportation circulation, parking, or social conditions, not the amount of use.

***What analyses describe how user capacities affect conditions of river values?***

Transportation circulation and parking models, capacity studies and related monitoring, riparian and meadow monitoring, and targeted research are all examples of such analyses. The goal of these use-condition analyses is to show how use levels affect important variables that define high quality conditions. A “road map” to capacity information in the *Merced River Plan/DEIS* is provided in this chapter, and Part III includes the details of the analyses. While this work relies upon knowledge of historical events and current conditions, it also requires predictions about the likely effects of the new management actions proposed in the alternatives.

***Why does the Merced River Plan/DEIS have different user capacities in the alternatives? Do they all protect river values?***

The National Environmental Policy Act requires environmental impact statements to consider a range of alternatives. The *Merced River Plan/DEIS* includes such a range, and all alternatives contained herein protect river values, but they do so in different ways. Alternatives produce different conditions by having different



combinations of user capacities, infrastructure, and related programs of management actions. All protect and enhance river values, as required by WSRA.

*What are the choices inherent in alternatives with higher vs. lower user capacities?*

User capacities, resource conditions, and the infrastructure to support visitation are foundational elements to the alternatives. Changing one of these components often has implications for the others. User capacities in the different alternatives show how higher and lower amounts of use fit with infrastructure and other management actions to produce different resource conditions, protecting river values in different ways. These represent choices for the kind of place the Merced River corridor will be and the visitor experiences available there in the future, all of which must protect river values as required by WSRA.

*Does the Merced River Plan/DEIS consider how user capacities will affect other Park uses?*

Yes. The river values to be protected under WSRA are limited to the river corridor and must be river-related or dependent, and regionally or nationally significant. But NPS also considered how use levels affect other attractions and uses in the park. For example, transportation system modeling and analysis looked at the effect of different parking capacities on the entire roadway network and related traffic conditions outside of the river corridor. The interconnectedness of user capacity and transportation is particularly important in Yosemite. High quality recreation and enjoyment of the river depends on an efficient transportation system that minimizes congestion and time spent traveling on roads, looking for parking, or waiting for shuttles or regional transit.

*What are the limiting factors to user capacity?*

The amount of use an area can sustain depends on its resource characteristics, the type and quantity of use anticipated, and the effectiveness of management actions. Ultimately, the factors that determine how much use is “too much” depend on the conditions being managed for and the type of use being considered. This will vary by river segment, each representing a different type of river area providing different opportunities for use.

*Does a given level of encounters equate to crowding?*

No, as crowding can be subjective. Defined as a negative evaluation of the number of people encountered, crowding involves an individual’s judgment about the number of other people s/he encounters as compared to his/her personal norms or expectations for that particular type of experience. Despite this seeming subjectivity, social norms for encounters are usually lower for more remote, solitary backcountry experiences, and higher for more social frontcountry experiences that involve more interaction with other people.

In setting indicators and standards for the various segments in the Merced River corridor, as well as devising the use levels under the various alternatives, park managers turned to studies done both in Yosemite and in other, similar natural resource areas. Planners then set the standards based on the desired experiences being sought in each segment and in each alternative. For example, one alternative may allow up to four encounters with other parties on a given stretch of trail while another offers half that amount; similarly, one alternative may allow up to 100 people on a given viewpoint in Yosemite Valley while another allows 120.

*How do you analyze the condition of recreational ORVs?*

Yosemite has a wealth of historic and current social science research and related studies that park managers utilized in understanding the condition of Merced River recreational values. These studies include visitor surveys, computer simulation modeling, and resource impact studies. Collectively, this robust body of

research helps describe the Merced recreational river values, and shows how use levels affect the quality of experiences in the Merced River corridor. Much of this information can be found on the park's website ([www.nps.gov/yose/parkmanagement](http://www.nps.gov/yose/parkmanagement)). Chapter 5 also summarizes much of this literature.

***How is transportation system performance and user capacity related to river issues?***

An efficient transportation and parking system is a key part of high quality recreation in the Merced River corridor. The transportation system, including roads, parking, and transit, is the primary means of access for most visitors to the river corridor, so any crowding or delays therein directly affect one's ability to recreate in the Merced River corridor. Moreover, scenic driving is the second most commonly reported recreation activity in Yosemite (64% of all park visitors take a scenic drive).

***Can user capacities be changed after the plan is completed?***

Yes. However, depending on the situation, such changes may be subject to renewed planning and environmental compliance for the National Environmental Policy Act and the Wild and Scenic Rivers Act. The NPS has applied the best available scientific information in the *Merced River Plan/DEIS* to make decisions related to management standards and user capacities. Monitoring and adaptive management allow the NPS to evaluate the success of these decisions and any future changes needed.

## PART II. PROCESS TO ADDRESS USER CAPACITY

The process used to develop the user capacity components of the *Merced River Plan/DEIS* is illustrated in Figure 6-1 and described below. User capacities are not independent of other decisions in the plan; they are embodied within comprehensive management prescriptions that include many other management actions (Haas 2003; Whittaker et al. 2010). For example, decisions about the extent and size of overnight facilities (hotels and campgrounds) to be provided in an alternative will equate to an associated room count and maximum occupancy (to be counted as part of the user capacity).

**FIGURE 6-1: USER CAPACITY PROCESS STEPS**

User Capacity Process Steps
1. Define river values and management goals
2. Document conditions and identify management considerations
3. Analyze kinds of use
4. Develop concepts and themes for alternatives
5. Identify indicators and standards
6. Analyze use and impacts to river values
7. Define draft alternatives and initial capacities
8. Relate capacities to river value conditions
9. Monitor and adjust capacities/management actions

## Step 1. Define River Values and Management Goals

River values (including free-flowing condition, water quality and outstandingly remarkable values) and management goals are the starting point for developing alternatives and associated capacities. River values focus attention on the most important resource conditions and recreation experiences, while goals are a commitment to management actions that will protect or enhance those values while providing for public use. River values and management goals stem from agency mandates and enabling legislation (see Chapter 2). They provide a foundation for the development of specific management standards that guide decisions about user capacity.

Management goals (see Chapter 1) of the Merced River Plan that are related to user capacity include: (1) protecting natural processes; (2) promoting visitor enjoyment; and (3) reducing traffic congestion and crowding. These goals were translated into desired future conditions for key components of river values, such as providing intact meadow or riparian areas and high quality recreation opportunities.

NPS identified segment-specific outstandingly remarkable values (ORVs) using guidance in the Interagency Guidelines (see Chapter 5 for a discussion). Inputs to the identification of river values and their conditions included public input and the best professional judgment of resource specialists and park scientists. Outputs of this process step included detailed descriptions of all river values and their mapped locations.

Not all ORVs are sensitive to variations in the *amount* of visitor or administrative use that occurs. For example, some of the geologic/hydrologic ORVs, like the Upper Merced's glacially carved canyon and the "Giant Staircase" river morphology, are not affected by how many people visit them. In contrast, other ORVs that *are* sensitive to use levels directly or indirectly influence capacity decisions in the *Merced River Plan/DEIS*. These include riparian and meadow conditions in Yosemite Valley, and recreation quality in the Merced River corridor above Nevada Fall and through Yosemite Valley. Although the ORVs are the primary focus of user capacity decision-making, NPS also considered effects of user capacities on other uses and destinations in the corridor (e.g., Bridalveil Fall, Wawona Swinging Bridge, scenic driving on park roads) or adjacent areas outside the river corridor (e.g., Yosemite Falls).

## Step 2. Document Conditions and Identify Management Considerations

For this step, the NPS documented the baseline condition of the river values. This included a comprehensive review of existing research and monitoring information, as well as additional research to fill information gaps. An important component of this assessment was the identification of the extent to which visitor use affects river values. NPS also developed maps of physical site constraints, which helped guide choices about facility locations and infrastructure design such that ORVs, wetlands, flood plains, archeological sites, rare plants, water quantity and quality, and other special resources were protected.

The planning team then used the baseline assessment, understanding of visitor use impacts, and personal observations of field personnel to generate a comprehensive list of management considerations that the Plan needed to address to improve conditions in the river corridor and ensure the protection of river values. A subset of these considerations was directly related to user capacity, or the kinds and amounts of use that could be accommodated.

### Step 3. Analyze Kinds of Use

Recreational use accounts for the greatest amount of public use that occurs in the river corridor (administrative use to support recreational use and resource protection are the other sizable contributors). During plan initiation and scoping, park planners asked the public to describe what they liked to do in the Merced River corridor and which facilities and services these activities would require. The resulting public scoping report (NPS 2006m) provided important feedback to the NPS regarding the level of public interest in different activities. This information gave planners a better sense of the uses that members of the public wanted to keep as well as those they preferred to see reduced or restricted.

Planners also conducted visitor surveys and studies to understand use patterns, and reviewed the findings of social science research completed for similar settings for its relevance to the Merced River (Littlejohn et al. 2005; Le et al. 2008; Blotkamp et al. 2010). This effort provided additional insight into the types of activities and experiences visitors preferred. Finally, NPS planners compiled information on the historic, current, and projected levels of visitor use along the Merced River (DEA 2007; NPS 2008d; NPS 2008e; NPS 2009c; and NPS 2009e).

Recreational and other public uses that do not meet the definition of an ORV (river related or dependent and rare, unique, or exemplary) are permitted under the Wild and Scenic Rivers Act and Guidelines as long as those uses do not “substantially interfere” with the use and enjoyment of ORVs and other river values.<sup>3</sup>

### Step 4. Develop Concepts and Themes for Alternatives

This step packaged management actions around themes to develop a reasonable range of preliminary alternative concepts, as required by NEPA. As discussed in Chapter 5 and shown in the descriptions of alternatives in Chapter 8, management actions include infrastructure changes (e.g., roads, parking, boardwalks, fences, or trails), restoration, and education/regulation programs that affect user capacities and work with them to protect and enhance river values. Several principles guided the development of alternative concepts:

- User capacities should vary across alternative concepts.
- Alternative concepts should represent a reasonable range of different futures (as required by NEPA), but all must protect ORVs by ensuring that river values are maintained at a management standard well above adverse impact (see Chapter 5).
- Some restoration actions, new developments, or infrastructure changes would be common to all alternative concepts, but others would vary across them.
- Similar management actions would be combined within alternative concepts to create conceptually meaningful and distinct themes.

At this stage, alternative concepts were not full management prescriptions, but were sufficient for more detailed analyses (see next steps) to assess the different choices related to the level of infrastructure, river value conditions, and user capacities (as discussed in the FAQ’s earlier in this chapter) inherent in each alternative.

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<sup>3</sup> WSRA Section 10(a); Guidelines, at 39456.

## **Step 5. Identify Indicators and Standards**

The next step established the desired conditions for all river values in terms of quantifiable indicators and standards. Indicators are variables selected to represent important resource or experiential conditions; standards define the line between “acceptable” and “unacceptable” conditions. For each indicator, park scientists identified management standards that would maintain conditions far above the critical levels of “adverse impact” and “degradation” specified for each river value (see Chapter 5). This step also included the identification of indicators that would be most sensitive to the effects of visitor use, particularly use levels. This subset of indicators was used in subsequent steps to further determine the amounts of use that could be received while maintaining conditions at or above management standards.

## **Step 6. Analyze Use and Impacts to River Values**

With indicators and potential standards developed, analyses shifted to further analyzing and understanding the relationships between use and the condition of each river value. This step built upon the foundational descriptive information developed in steps 2 and 3. Analyses applied the best available scientific data and included predictive modeling where available. A summary of the specific use-impact analyses for each segment is provided in Part III of this chapter. Examples of these analyses include:

- Correlations between use densities at Valley attraction sites and overall park visitation (based on various studies conducted in 1998, 1999, and 2007-2010).
- Correlations between Valley beach and boating use densities and overall use levels (Whittaker and Shelby, 2011).
- Transportation system modeling, including traffic circulation and parking supply and demand analyses (DEA and NPS, 2007-2011).
- NPS resource monitoring data (NPS 2005 – 2011).
- Professional judgments about relationships between use and riparian and meadow conditions.

## **Step 7. Define Draft Alternatives and Initial User Capacities**

This step took the alternatives concepts developed under step four and more fully articulated them as draft alternatives. Park planners fully integrated the suite of management actions for each alternative, connecting indicators and standards to river values and determining the user capacities that would meet those standards and protect river values. Planners based initial user capacities on river value conditions, related mapping of resource site constraints, analysis of transportation system performance and the limitations therein. Park planners developed the draft alternatives to provide different visitor experiences and use levels within these constraints.

## **Step 8. Relate Capacities to River Value Conditions**

Park planners reviewed the initial user capacities developed in step 8 to ensure that proposed capacities in each alternative would be consistent with the protection and enhancement of river values. Using the same literature from previous steps, as well as any new information that had been generated in completing earlier steps, park planners re-analyzed the capacities to confirm that they would not adversely impact river values. Part III of this chapter summarizes user capacity information across alternatives for each segment.

## Step 9. Monitor and Adapt Management

As part of the plan, park planners designed a monitoring program to ensure that use and conditions remain at predicted levels, such that river values are protected and enhanced. As indicated in Chapter 5, each indicator also specified management actions that would be taken should resource conditions fall below the management standard (the “triggers” in Chapter 5). This step recognizes that predictions made during planning may change, new uses or impacts may arise, or unanticipated consequences may produce unacceptable impacts to river values. The Secretarial Guidelines encourage such monitoring and adaptive management, as does the visitor use management literature (see Cole 1990; Cole and Stankey 1997; Marion 1998; Hammit and Cole 1998; Cole et al. 2005, Manning 2007, McCool et al. 2007; Manning, 2011; Whittaker et al., 2011).

## PART III. USER CAPACITIES

This part of Chapter 6 provides a summary of the user capacities established for each alternative in the plan by river segment. The discussion of the capacities under each segment is further divided into the following sections:

### Management Goals and Considerations

This section discusses the river values, management goals, and capacity considerations relevant to each river segment.

### Indicators and Standards

This section summarizes the specific indicators and management standards that are incorporated into the user capacities established for each river segment. The section also includes a discussion of how the amount of use affects the condition of river values.

### Overview of Capacities

This section summarizes the user capacities established for each river segment, along with related management actions and other implications. These capacity figures are organized by the overall types of use that occur in the river corridor: visitor overnight capacity, visitor day-use capacity, and administrative capacity.

### Capacity Management

This section summarizes user capacity management actions for each segment. It describes the key infrastructure, forms of education and regulation, and other management actions that ensure the kinds and amounts of use allowed in each segment do not exceed stipulated levels or adversely affect river values. Each alternative is a complete management prescription that includes user capacities and a variety of other management actions.

### Conclusion

This section summarizes the key choices inherent in the capacities that have been established for each river segment across the alternatives.

## Segment 1: Merced River Above Nevada Fall

### *Management Goals and Considerations*

Management goals related to user capacity in this segment include: (1) protecting natural processes; (2) promoting visitor enjoyment; and (3) reducing crowding.

The outstandingly remarkable value in this segment most sensitive to user capacities is river-related recreation in an iconic high Sierra setting. This river value features “opportunities for primitive and unconfined recreation, self-reliance, and solitude which are intimately tied to the corridor’s wilderness character.” The entire segment is also in designated Wilderness (with the exception of the Merced Lake High Sierra Camp area). The associated management objective is to “provide for high quality river-related recreation opportunities oriented toward wilderness values,” including “unconfined, self-reliant, and solitude experiences.”

The corridor above Nevada Fall has other biological, geologic/hydrologic, and scenic outstandingly remarkable values, but none are substantially affected by the amount of current or potential visitor or administrative use. Although trails, dispersed campsites, designated camping areas, and the Merced Lake High Sierra Camp have site-specific impacts, these are due more to type and location of use than the amount of use. In addition, most site impacts can be adequately addressed by good trail design, appropriate campsite location, and “Leave No Trace” behavior encouraged by existing and largely effective education or regulation programs. Similarly, the scenic impacts associated with development at those camps and associated ranger/trail crew facilities can be addressed via design guidelines employed within processes that are independent of user capacity.

A review of baseline and existing conditions, studies, monitoring, and public involvement information identified several specific user capacity-related issues for the recreation ORV, including:

- Solitude vs. crowding on trails.
- Densities of campers at designated camping areas.
- Level of development at Merced Lake and effects on wilderness character.
- Level of development at Little Yosemite Valley (LYV) and effects on wilderness character.

Other management considerations that affected the determination of capacities in this segment were as follows:

***Level of development.*** The Wilderness Act states that a wilderness is “an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation” (16 U.S.C. 1131-1136, Section 2c). Similarly, the river classifications contained in the Wild and Scenic Rivers Act guide the level of development appropriate in river segments. According to the WSRA, ‘wild’ river segments are generally inaccessible except by trail, with watersheds and shorelines essentially primitive and waters unpolluted.” Wild river segments represent “vestiges of primitive America.” A “wild” classification suggests limited development and infrastructure, thereby limiting the kinds and amounts of use that are appropriate for the segment.

***Resource constraints and site suitability.*** These constraints include topography, meadow and riparian areas, rare and sensitive plant and animal populations, scenic vista points, and cultural resource sites

Generally, plans for visitor use and access to the river corridor will identify and avoid these sensitive resource areas to minimize the risk of unacceptable impacts.

**Wilderness experience.** As described by the recreational outstandingly remarkable values and the Wilderness Act, outdoor recreation in the Merced River's wild segments are primarily oriented toward "outstanding opportunities for solitude or a primitive and unconfined type of recreation." Therefore, for the wilderness segments of the Merced, the key constraint for user capacity is the recreational outstandingly remarkable value where wilderness-related recreation and opportunities for solitude are emphasized.

### *Indicators and Standards*

The primary indicator that affects capacity determinations in this segment is trail encounters. Encounters have a long history of management application in backcountry areas (Vaske et al, 1986; Shelby et al, 1996; Manning, 2010). In lower-density backcountry areas, most studies address encounters per day, with considerable research suggesting standards of about five encounters per day or less for "wilderness experiences" (Vaske et al, 1986). In higher density settings (including Tioga Road backcountry, several national forest wildernesses in Oregon and Washington) encounters have been measured and managed per hour. As discussed in Chapter 5, trail encounters are measured as the number of encounters per hour during the middle of the day (10 to 4 pm) in the high-use summer season. Table 6-1 shows the encounter standards for this segment across the different alternatives in the *Merced River Plan/DEIS*:

**TABLE 6-1: SUMMARY OF KEY USER CAPACITY INFORMATION: MERCED CORRIDOR ABOVE NEVADA FALL**

Alternatives	1	2	3	4	5	6
	Existing situation	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
<b>Indicators/standards: Encounters with other groups per hour on trail segments</b>						
LYV to Lewis Creek	-	2	3	3	3	4
Lewis Creek to Lyell Fork	-	1	1	1	1	1

As shown, the indicator is delineated by trail segments (LYV to Lewis Creek, and Lewis Creek to Lyell Fork); this is because use levels in this segment vary widely on different parts of the trail system. The relationship between use and *trail encounters* appears to be direct and linear, with lower use and encounters on trail segments farther from trailheads and developed areas, such as Lewis Creek to Lyell Fork (Newburger et al. 2009-2011).

Most stock use in the corridor is associated with supply of, and visitor transport to, the Merced Lake High Sierra Camp. Alternatives that reduce or eliminate the camp will equate to less stock use in this segment.

The one-mile segment of the corridor from Nevada Fall to LYV experiences high density use dominated by Half Dome climbers. To address user capacity on this trail segment, the *Merced River Plan/DEIS* adopts the day-use permit system recently established through management planning for Half Dome, which limits ascents to 300 users per day. Although this results in higher encounter rate than is allowed elsewhere in the segment, this is a short trail section, Half Dome use levels are limited to a third of historical peak use levels, and many Half Dome users (knowing what the daily limit is) probably expect a higher-density experience.



## Overview of Capacities

A summary of user capacities by alternative for this segment is presented in Table 6-2. All user capacities in this table refer to people spending the night in the segment (overnight use); using it for part of one day (day use); or administrative overnight and day use.

**TABLE 6-2: SUMMARY OF USER CAPACITIES BY ALTERNATIVE: MERCED CORRIDOR ABOVE NEVADA FALL**

Alternatives	1	2	3	4	5	6
	Current management or “No action”	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
Visitor overnight capacity						
Wilderness zone user capacities						
LYV Zone	150	25	75	100	150	150
Merced Lake Zone	50					
Washburn Lake Zone	100					
Mount Lyell Zone	10					
Clark Range Zone	10					
Merced Lake HSC	60	0	15	0	42	60
Total	380	195	260	270	362	380
Visitor day-use capacity						
Half Dome “pass through” use	300					
Other day use	50					
Total	350					
Administrative capacity						
Employee housing	15	5	10	10	15	15
Administrative day patrols	5					
Total	20	10	15	15	20	20
TOTAL SEGMENT CAPACITY	750	555	625	635	732	750

## Visitor Overnight Capacity

The overnight capacities for this segment are expressed in terms of the maximum number of people that can camp in a given wilderness zone each night. These zone capacities are part of the wilderness overnight permit system, which is described in the "affected environment" section of this plan. Most overnight use in this river segment occurs in the LYV wilderness zone, which has a maximum capacity of 150 people. Due to the higher amounts of use allowed in this zone, overnight camping is focused in designated camping areas at LYV, Moraine Dome, Echo Valley and Merced Lake. These designated areas allow for consolidation of overnight use to minimize the geographic extent of impacts. The other zones allow for dispersed overnight use because use levels are lower and impacts can be mitigated by allowing campsite locations to vary by individual preference.

The *Merced River Plan/DEIS* proposes changes in the wilderness zone capacities for the LYV zone to allow for a range of visitor experiences in this segment. Alternatives 2, 3, and 4 reduce the LYV zone capacities from 150 to 25, 75, and 100 respectively. These changes offer visitors the opportunity to camp in a dispersed manner out of sight and sound of others. In all other wilderness zones, capacities remain at current levels, ranging from a maximum of 50 to 150 people per night, depending on location.

The Merced Lake High Sierra Camp is a designated camp area operated by the primary park concessioner. The camp is located within a potential wilderness addition. The camp contains a number of tent cabins, which accommodate 2-4 persons per tent. The *Merced River Plan/DEIS* includes several options for the camp, including its removal (capacity of zero) to reduced capacities of 15 people per night in Alternative 3 (in the form of a temporary outfitter camp, which would have a reduced level of service over today's camp) and 42 people per night in Alternative 5. Alternative 6 proposes retaining the camp at its current capacity of 60 people per night.

### **Visitor Day-use Capacity**

Day use along this segment is low compared to the three segments downstream on the Merced River. Most day use occurs on the trail between the top of Nevada Fall and LYV, and is primarily associated with climbing Half Dome. As noted previously, day use on Half Dome is limited by a hiking permit and reservation system to a maximum of 300 people per day. The small amount of other day hiking that occurs in this segment is estimated at 50 people per day, bringing the total maximum daily capacity for day use in this segment to 350 people.

### **Administrative Capacity**

Administrative use along this segment is primarily associated with wilderness patrols, trail crews, utility and maintenance crews, and search and rescue operations. An overnight administrative camp is maintained at LYV during the summer. The camp and its operation are located away from the river and have been shown to have no adverse effect on river values. The camp currently accommodates up to fifteen employees. The *Merced River Plan/DEIS* alternatives propose reducing the administrative capacity of the camp consistent with the reductions proposed in the wilderness zone capacities discussed above. These options range from five employees in Alternative 2, to 10 in Alternatives 3 and 4, and 15 in Alternatives 5 and 6.

Minimal administrative day use occurs along this segment, estimated at no more than five employees on day patrols originating from the Valley or passing through. This level is consistent across alternatives.

### **Capacity Management**

This section provides an overview of the key capacity management actions for this segment: the infrastructure decisions and policy and regulation measures to enforce the user capacity numbers and ensure the kinds and amounts of use proposed in the different alternatives do not adversely affect river values. Table 6-3 provides a summary of the user capacity management actions across the plan alternatives for this segment.

### **Infrastructure**

The LYV designated camping area would be removed in Alternatives 2 & 3, whereas the other alternatives retain the area. The composting toilet facility is removed in Alternative 2 to improve wilderness character but retained in all the other action alternatives to accommodate both day and overnight use. The LYV ranger camp is retained in all alternatives, though the size of the camp is reduced in Alternatives 2, 3 and 4 commensurate with reductions in zone capacity. Similarly, the alternatives consider different options for the Merced Lake High Sierra Camp, including elimination, conversion to a temporary outfitter camp, downsizing, and retaining it in its present form.

**TABLE 6-3: SUMMARY OF KEY USER CAPACITY-RELEVANT INFORMATION: SEGMENT 1**

Alternatives	1	2	3	4	5	6
	Existing situation	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
Infrastructure						
LYV Backpackers camping area structures	Toilet	Removed	Toilet retained			
LYV ranger camp	3 tent cabins	Reduced	Reduced	Reduced	Retained	
Merced Lake HSC (structures and beds)	22 units 60 beds	Removed	Temp camp 15 beds	Removed	11 units 42 beds	22 units 60 beds
Policy and Regulation						
Overnight permits	Continue use of wilderness permit system					
Overnight group size limits	15 on trails, 8 off trails					
Camping restrictions	Camping in designated areas at ML and LYV Camp 100 feet from water	Dispersed camping in LYV and ML zones Camp 100 feet from water		Camping in designated areas at ML and LYV Camp 100 feet from water		
Stock use management	Maximum 25 head of stock per group on trail and 12 on other routes Travel in single file line whenever possible Use weed-free feed Must be picketed at least 100 feet from any stream, lake or spring Watering facilities must be used when provided					
Leave-No-Trace regulations	No fires above 9,600 feet Fires in fire rings only otherwise Mandatory bear-resistant food canisters Carry out all trash Bury human waste No bicycles/strollers No mechanized / motorized travel					
Half Dome use limits	None	300 per day				
Other day use on trails in river corridor	50	50				

## Policy and Regulation

The *Merced River Plan/DEIS* proposes the continued use of the wilderness overnight permit and trailhead quota system with numeric adjustments in certain alternatives. Overnight use of the wilderness in Yosemite National Park, including the river segment above Nevada Fall, has been managed for about 30 years using a zoning and trailhead quota system. The entire wilderness area within the park has been split into zones and each has been assigned a maximum daily capacity for the number of people that can stay overnight in each zone. The zone capacities are allocated to the relevant trailheads and managed by permit. Permits are available on a mixed first come-first served and advanced reservation basis.

This system has been in place for many years and effectively limits the number of people starting from each trailhead and spending the night in different parts of the wilderness. It protects recreation values in this segment by spreading use over a wide area to keep trail encounters and camping concentrations low (with exceptions for areas like Little Yosemite Valley). Other regulations and education programs address other ORVs to mitigate visitor use impacts (e.g., site impacts, ecological impacts) in combination with use limits, including:

- Camping restrictions (designated areas at Merced Lake and LYV; 100 feet from water otherwise);
- Stock use regulations (maximum group size limits, and others);
- Fire restrictions (none above 9,600 feet; in fire rings otherwise);
- Food storage restrictions (mandatory bear-resistant food canisters);
- Carry out trash regulations;
- Human waste disposal regulations and education;
- Regular trail and camping area maintenance addressing site impacts (e.g., trail cutting, campsite boundary encroachment, etc.),
- Half Dome hiking permits

### ***Conclusion***

The primary choices related to user capacities above Nevada Fall were driven by the management standards and goals for the recreational river values in this segment. These include choices between the amount of access to be provided, the level of infrastructure, and the amount of relative solitude that could be experienced along this segment as measured by encounter rates. For example, in the higher-use alternatives, encounter levels in the LYV to Lewis Creek trail segment are double those of the lower-use alternatives. The higher-use alternatives also maintain LYV, Lake Merced camping, and the Merced Lake High Sierra Camp at use levels similar to recent management, requiring more infrastructure (LYV toilet, HSC facilities) and yielding higher encounter rates with other users.

## **Segment 2: Yosemite Valley**

### ***Management Goals and Considerations***

Management goals related to user capacity in Yosemite Valley include: 1) protecting natural processes; 2) promoting visitor enjoyment; and 3) reducing traffic congestion and crowding.

The two outstandingly remarkable values in this segment that are most sensitive to user capacities are the meadows and riparian communities of Yosemite Valley and the outstanding opportunity for frontcountry river recreation. The management objective for the meadow/riparian ORV is “to manage human use within the corridor to minimize habitat fragmentation in meadows, maintain high ecological condition, and protect the integrity of riverbanks to conserve ecosystem processes.” The management objective for the recreation ORV is to “provide for a diversity of high quality river-related recreation opportunities that allow visitors to directly connect with the river and its environs.”

Yosemite Valley’s other categories of outstandingly remarkable values (including geologic/hydrologic, cultural and scenic), are not substantially affected by the current or projected levels of visitor or administrative use. For example, use does not affect the large scale geological/hydrological features such as the “Giant Staircase” (Nevada and Vernal Falls). However, some of these values clearly interact with user capacity decision-making by limiting choices about infrastructure placement and design.

Other considerations affecting the kinds and amounts of use that can be accommodated in the Valley segment include the following:

**Resource constraints and site suitability.** These constraints include floodplains, rock fall hazard areas, meadow and riparian areas, rare and sensitive plant and animal populations, scenic vista points, and cultural resource sites. Maps of river values and resource constraints show that there is limited space in the Valley that is available for visitor or administrative activities and related infrastructure. Bridges and river bank revetments (riprap) impact the river's free-flowing condition from Happy Isles to the Gorge, and improvements to allow for river migration will limit the range of transportation options available to handle additional use (e.g., bridge removals, road realignments).

**Transportation system performance.** Most visitors (64%) report "taking a scenic drive" during their trips to Yosemite, and riverside travel routes provide views that contribute to the Valley's scenic and recreation outstandingly remarkable values (Blotkamp et al. 2010). Congested roads reduce the quality of viewing and limit visitor access to recreation sites. Therefore, an efficient transportation and parking system is a prerequisite for a quality recreation experience in this segment.

Park planners used transportation modeling to determine how the levels of vehicle use allowed in each alternative would affect traffic circulation (DEA 2012). Transportation models also allowed planners to explore the relationships between improved circulation and changes to infrastructure, such as pedestrian underpasses, roundabouts, and additional parking. The use-impact relationships described below helped shape infrastructure choices in the alternatives.

**Visitor experience and crowding.** Providing outstandingly remarkable recreation opportunities requires managing user densities to avoid congestion and crowding as visitors hike, bike, relax, picnic, swim, and fish along the Merced River or while visiting attractions in or near the corridor. Several social science studies have documented crowding and congestion problems in Yosemite Valley during peak use periods (Gramann 1992; Manning 1998 and 1999; Newman 2002; NPS 2005 and 2009, Whittaker and Shelby, 2012). Further research has demonstrated the link between visitation, densities at popular attraction sites, and the quality of visitor experience (DeGroot and Meldrum, in review). These relationships have been explicitly considered in the development of user capacities for the *Merced River Plan/DEIS*.

## **Indicators and Standards**

Table 6-4 summarizes the key indicators and standards used to monitor the condition of the Segment 2 ORVs that are most vulnerable to user effects (Chapter 5 provides more detail on all of these indicators and standards). Capacities that limit use are needed to ensure that standards are not exceeded and ORVs are protected.

### **Meadow Conditions**

As explained in Chapter 5 (under ORV 2), the Largest Patch Index Five or LPI<sub>5</sub> measure is sensitive to the size of intact areas and the amount of informal trails, and indicates impacts related to meadow hydrology, soil moisture, non-native species, habitat quality, and barriers to small mammals (see Chapter 5 for a more detailed discussion). The standard for this indicator is common to all alternatives, so alternatives vary the amount of infrastructure (boardwalks, trails, and split rail fencing) used to manage the amount, location, and type of use associated with the range of user capacities across alternatives.

**TABLE 6-4: SUMMARY OF USER CAPACITY-RELEVANT INDICATORS AND STANDARDS**

Alternatives	1	2	3	4	5	6
	Current condition	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
Biological indicators and other management actions						
Meadow fragmentation – average		> 93% average for all; > 90% for individual				
Riparian condition -- % of reaches in high classification		> 20%				
Riparian condition -- % of reaches in moderate or high classification		90%		80%		
Densities at attraction sites or on trails (square feet per person; higher number means less dense/more space) <sup>1</sup>						
Primary viewing areas	50	70		60	50	40
Vernal Fall trail	40	60		50	40	35
East Valley multi-use and hiking trails	40	60		50	40	35
West Valley hiking trails	100	140	120	100	80	80
Waterfront per person at beaches (linear waterfront per person; higher number means less dense/more space) <sup>1</sup>						
East Valley high use shore areas	10	10	20		10	5
East Valley medium use shore areas	10	10	20		10	5
West Valley low use shore areas	10	10				
Boating densities (Boats per 400 feet; higher number means more dense/less space) <sup>1</sup>						
Stoneman Bridge to Sentinel Beach	6	1	2	6	3	9
Transportation indicators (Vehicles on the ground at one time - VAOT)						
Parking occupancy (VAOT)		< 90% of parking supply occupied				
1. Standard: average cannot violate standard more than 10% of time between 10 am and 4 pm.						

Lower fragmentation scores are associated with meadows containing more informal trails. Informal trails are more likely when visitors have multiple access points, allowing them to spread out throughout meadow areas, creating more trails. Higher fragmentation scores, by contrast, are associated with meadows having few informal trails. As shown in Chapter 5, such meadows may have high levels of use on formal trails, with nearby formalized parking. For example, Stoneman Meadow used to have a fragmentation index of only about 40 percent, but NPS improved this score to over 99 percent by developing a single formal trail with a boardwalk, even though park visitation increased by more than 50 percent during the same time period. Fencing can also be used to funnel use into more resistant areas.

The types of measures described above address impacts by changing human behavior or by employing more intensive action where use levels are greater. New designs would remove most roadside parking in all alternatives, and trails and fencing would be used to control impacts from development (new or expanded campgrounds) in higher use alternatives (5 and 6).

### Riparian Conditions

Riparian conditions will be assessed through the *California Rapid Assessment Method (CRAM)*, as discussed in Chapter 5, ORV 2. As with the fragmentation indicator, standards for this indicator would vary across alternatives, as shown in Table 6-4. Baseline assessments using this evaluation tool show that lower condition classes were generally associated with higher use areas near campgrounds and accommodations,

although riverbank development (especially revetments) also appears to be important. Riparian recovery is slower when informal trails are allowed to proliferate between camps/developed areas and the river, and this may be related to use levels. However, the problem is not primarily the amount of use. The number of people who camp or hike in a riparian area is unlikely to have a direct or linear relationship with total CRAM scores because the type, location, and behavior of users have substantial effects. Directing visitors to appropriate locations and closing sensitive areas, in combination with the availability of hardened or designated trails, can substantially reduce impacts.

A riparian development buffer (no development within 150 feet of the river's edge) is common to all alternatives. It is designed to substantially improve riparian condition throughout the Valley by removing facilities and associated use concentrations from riparian areas. Some alternatives further reduce riparian-proximate development (e.g., campsites or Housekeeping units) or identify additional riparian restoration efforts to further enhance this ORV.

Neither the riparian development buffer nor restoration actions directly limit numbers of visitors in Valley riparian areas. They affect total Valley user capacities only to the extent that they change the number of camping sites, lodging units, and day use parking spaces. Riparian conditions are most directly addressed through more intensive management of the location and type of use in site-specific areas. The major management actions involve designating formal trails (with boardwalks or other hardening as needed) and fencing to direct use away from sensitive areas. These actions are most effective to reduce existing impacts, prevent new ones, and allow rehabilitation.

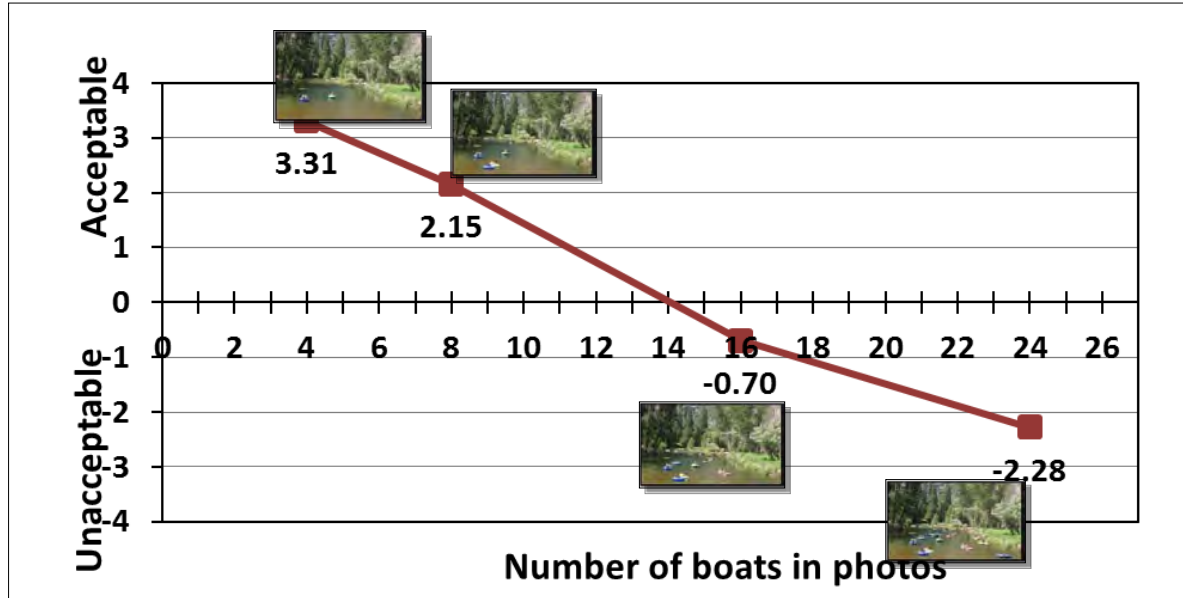
Planners used information about CRAM scores, baseline conditions, transportation modeling results, available research results, and professional judgment to estimate linear feet of new fencing and boardwalks needed for each alternative. Alternatives with higher capacities (and associated higher levels of development closer to riparian areas) have higher levels of infrastructure (boardwalks and fences) to mitigate the impacts of higher use. This appropriately-sited trail infrastructure would keep visitor impacts to acceptable levels (standards) while directing visitors to more resistant riparian areas that can handle higher use (e.g., beaches and bedrock banks). Because these mitigation measures have been incorporated, riparian condition does not act as a limiting factor for user capacities in Valley segments.

## Social Conditions

The primary indicators selected to represent social conditions were visitor densities at ORV-related attractions or on the way to them (e.g., beaches, boating, and the trail to Vernal Fall), as shown in Table 6-4 above. The focus on attraction site densities follows from research in many frontcountry settings (Manning, 2011), and is the higher density analogue of encounters in backcountry settings. Information about these indicators comes from studies at popular high-use sites (Manning et al. 1998; Manning et al. 1999; Lawson et al. 2008), as well as research on shore and boating use in East Yosemite Valley (Whittaker and Shelby 2012).

In these studies visitors are asked to evaluate the “acceptability” of a series of photographs depicting different levels of use or social conditions by identifying the photograph that best represents the level of use that they expected (*expectation*); prefer to see (*preference*); represent a condition where they feel the NPS should take action (*management action*); or represented a condition that would cause them not to visit the site again in the future (*displacement*). When plotted on a graph, average ratings show visitors’ acceptability evaluations (or norms) for use levels and related social conditions (Figure 6-2).

FIGURE 6-2: VISITOR'S' ACCEPTABILITY EVALUATIONS FOR USE LEVELS



All densities in these studies can be translated into people at one time, people per viewscape, or boats at one time (PAOT, PPV, or BAOT) in a specific photo, as evaluated in the studies. They can also be translated into daily use in an area, as discussed later in this chapter in a sidebar on “How Capacities Were Calculated: Assumptions and Protocols.”

For trail segments and viewing areas with defined boundaries, densities were measured as square feet per person. For beaches, densities were represented as linear feet of waterfront per person. For boating, densities refer to boats per 400 feet (a typical viewshed). All density indicators refer to the average for five-hour daily peak use periods measured during the high-use summer season. Standards can be exceeded by 10 percent at any given site to account for random but infrequent spikes in use. If use during these peak times is managed to meet standards at the highest-use attractions (e.g., Yosemite Falls, Vernal Fall, high-use beaches in East Valley), observed use patterns suggest that lower use will occur at these same sites during other times of the day, week, or season. These off-peak periods will provide higher quality experiences for visitors who are sensitive to crowding. Even on the days with highest use levels, when some beaches approach density standards, nearby beaches (sometimes within a few hundred feet) usually have densities closer to “preference” levels (Whittaker and Shelby 2012). Overall, user capacities that manage use to meet standards for the highest-use places will also provide a diversity of lower-use paces with better conditions.



## How Capacities Were Calculated for the Valley: Example Assumptions and Protocols

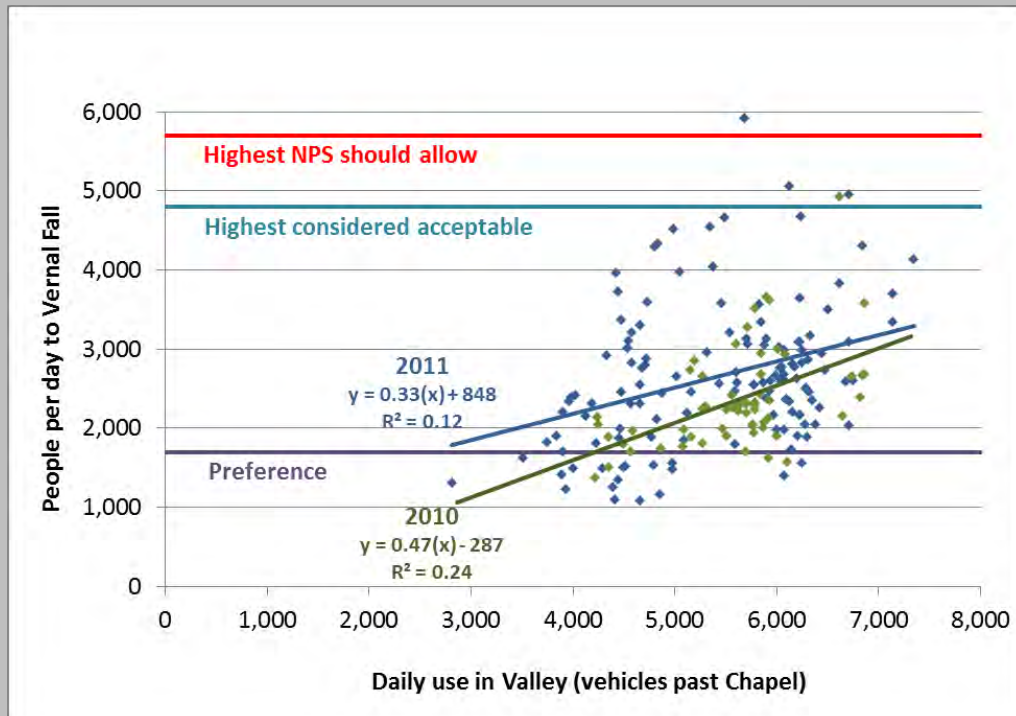
There were many calculations involved in developing capacities for each alternative. Some involve “translations” between use levels for different locations, times, or units of use (see capacity definition in Part I of this chapter), while others document or predict use-condition effects. This sidebar provides a few examples of capacity calculations or assumptions. The goal is to allow readers to understand these issues without all the details from research, modeling, or analyses.

### Translating densities at attraction sites to Valley use levels

#### Vernal Fall Example

- Surveys of visitors identified evaluations for preference, acceptability, and NPS action, based on photos of at-one-time densities on the Mist Trail (Manning et al., 1998).
- Trail counters identified hourly use levels (in each direction and total) along the trail.
- Simulations estimated total daily use on the trail to meet the preference, acceptability, or NPS action evaluations (assuming evaluations were exceeded no more than 10% of the time).
- Additional analyses correlated site use with daily traffic levels into East Yosemite Valley (measured at the Chapel on Southside Drive).
- Figure 6-3 (below) shows the relationship between 2010 and 2011 daily use levels on the Vernal Fall trail (vertical axis) vs. daily traffic levels into East Yosemite Valley (horizontal axis). Evaluation levels for preference, acceptability, and NPS action are also shown.
- Relationships between use and densities were generally direct, linear, and moderately strong. Explained variance ( $R^2$ ) for the number of vehicles arriving in East Valley and site use was higher for iconic roadside attractions (e.g., 0.81 for Bridalveil Fall and 0.64 for Yosemite Falls) than for activities or sites farther from the road (e.g., Vernal Fall; 0.12 and 0.24 in different years) or that require more time to experience (e.g., river rafting; 0.11).

**FIGURE 6-3: RELATIONSHIP BETWEEN DAILY USE LEVELS IN EAST YOSEMITE VALLEY**



The standards for these density indicators vary by type of site and alternative, as discussed in Chapter 5. Higher use sites and alternatives have higher density standards, and range from 35 to 70 square feet per person at moderate to higher-use areas (e.g., the trail to Vernal Fall, several popular trails in East Yosemite Valley) and 80 to 140 square feet per person on low-density trails in the West Valley. Moderate to high-use beaches ranged from five to 20 linear feet of waterfront per person, while lower use beaches were set at 20 linear feet per person for all alternatives. Boating standards focus on boats per viewshed and range from one to nine boats per 400 feet. In all cases, standards are “better” than current visitors say they will “accept” or are the highest use they want the “NPS to allow” in studies, while more stringent standards (for lower-use sites or alternatives) are closer to visitors’ preference evaluations.

In addition to standards for densities at ORV-related recreation attractions, park planners assessed the effects of capacities for Bridalveil Fall and Yosemite Falls, two other locations that were the focus of recent social science research. Even the highest-capacity alternatives would not produce densities higher than acceptability evaluations at Yosemite Falls. At Bridalveil Fall, however, all alternatives would continue to produce densities higher than visitors consider acceptable; accordingly, all alternatives include redesign options or other actions to reduce congestion in the vicinity of Bridalveil Fall.

**Vernal Fall:** The number of people present at any one time at this location is directly related to the number of vehicles, and therefore people, that enter the park each day. Relationships between Vernal Falls trail densities and overall Valley use (measured by vehicles per day passing the Chapel on Southside Drive) are direct, linear, and moderately strong. Variables that affect this relationship include river flows (more water over the falls improves aesthetics), the Half Dome permit system (which controls some portion of use on the trail associated with Half Dome), and the higher proportion of overnight visitors on the trail (relatively stable through the peak season when all accommodation is typically filled). Only a few high-use days had use levels greater than *management action* or *acceptability* evaluations (about 5,000 to 6,000 visitors per day on the trail), and most were between preference and acceptability evaluations (Manning et al. 1998; Manning et al. 1999; Lawson et al. 2008). Some of the highest days were artificially high (when the trail reopened after a search and rescue incident).

Park planners further used these relationships to predict trail densities associated with different capacities in the alternatives, with some adjustments for proportion of new use that would be overnight vs. day use (overnight visitors are more likely to hike to Vernal Falls).

**East Valley Beaches:** Relationships between peak densities at East Valley beaches and overall Valley use (vehicles passing the Chapel on Southside Drive per day) are direct and linear, but somewhat lower than the use-condition relationship for Vernal Fall (see discussion in Whittaker and Shelby 2012). Whittaker and Shelby also showed how existing densities on several beaches compare to “management action,” “acceptability,” and “preference” evaluations. Only a few high-use days and high-use beaches had existing densities greater than “what NPS should allow” or what river visitors consider “acceptable” (about 3 feet of beachfront per person). Average beach densities ranged from six to 12 feet of beachfront per person during afternoon peak-use periods, and many of these were better than “preference” evaluations at about 10 feet per person.

Using these relationships, park planners predicted beach densities for the alternatives, with some adjustments based on other variables. For example, additional campground or lodge use will probably have larger effects on beach densities because overnight visitors are more likely to use river beaches.

**West Valley Beaches:** The 2012 river study did not assess use levels downstream of El Capitan Bridge. Use is low and sporadic in these areas and most beaches attract only one to two small groups at a time. Using this information, park planners predicted relationships between use and densities at these beaches, finding that alternatives with higher use are not expected to substantially change existing use patterns because the alternatives would not provide additional access or infrastructure to promote or support greater use in these areas.

**Boating:** Relationships between boating use (between Stoneman Bridge and Sentinel Beach) and overall Valley use (measured by vehicles passing the Chapel on Southside Drive per day) are direct, linear, and relatively strong for commercial boating use, although weaker for total boating use (Whittaker and Shelby 2012). As for East Valley beaches, Whittaker and Shelby (2012) also showed how existing boating densities compare to “management action,” “acceptability,” and “preference” evaluations of visitors. In general, existing densities were not greater than visitors’ evaluations of “what NPS should allow” or “what they consider acceptable.”

Using these relationships, park planners predicted boating densities for the alternatives, with some adjustments based on other variables in the alternatives. For example, additional campgrounds or lodges proposed near the boating segment would probably have larger effects on boating densities because overnight visitors are more likely to participate in this activity.

**Yosemite Falls:** Relationships between daily Yosemite Falls trail use and overall Valley use (measured by vehicles per day passing the Chapel on Southside Drive) are direct, linear, and moderately strong. Water level also affects this relationship, with higher use observed when the falls are running at their peak flows.

By translating PAOT evaluations from several earlier studies into daily visits, park planners were able to see how daily use levels compare to “management action,” “acceptability,” and “preference” evaluations at this site (Manning et al. 1999, Lawson et al. 2007). This exercise and recent visitor count data show only a few days with use levels greater than visitor evaluations of “what NPS should allow” or “what they consider acceptable” (about 12,000 to 13,000 visitors per day), and many days were closer to the mid-point between these “acceptable” levels and “preference” levels (about 5,000 per day).

Park planners used general relationships between overall Valley use and use at Yosemite Falls to estimate densities with different capacities in the alternatives, with some adjustments based on proportion of use expected to come from overnight versus day users.

**Bridalveil Fall:** Relationships between daily Bridalveil Fall trail use and overall Valley use (measured by vehicles per day passing the Chapel on Southside Drive) are direct, linear, and moderately strong. Again comparing daily use levels to “management action,” “acceptability,” and “preference” evaluations, park planners found that many days had daily use levels greater than what visitors evaluated as “what NPS should allow” or “what they consider acceptable” (about 2,500 to 3,000 per day), and very few were near “preference” levels about 700 to 800 per day (Manning et al. 1999, Lawson et al., 2007). Consequently, redesign of this site’s parking, circulation, trails, and viewing areas is common to all alternatives, to bring this site’s visitor experience within acceptable levels for each alternative. These changes, coupled with the user capacity measures in each alternative, would resolve the levels of crowding associated with existing use patterns at this site.

**Summary:** Taken together, social indicators and standards define “how much impact is too much” at several important recreation areas and attractions in the Valley. With known relationships between use and these impacts, park planners designed alternatives with user capacities that provide for a range of density conditions.

### **Transportation System Performance**

Transportation modeling was an integral part of the capacity analysis because vehicle congestion has a direct relationship to visitor densities and related experiences at attraction sites as described above. Each alternative assessed how levels of vehicle use (associated with overnight accommodation and day-use parking decisions) would affect traffic circulation (DEA 2012). Modeling also explored the relationships between circulation and infrastructure choices such as pedestrian underpasses, intersection improvements, and additional parking. An understanding of the relationship between use and impacts to river values (see below) helped shape infrastructure choices in the alternatives.

Park planners selected day-use parking availability as the indicator for transportation system performance. This indicator addresses one of the most important parts of the transportation system. The parking supply (number of parking spaces) varies by alternative as a result of interrelated decisions about amount of restoration, removal or repurposing of existing facilities, and amount of camping and lodging (with associated parking requirements). Circulation, the other major part of transportation, is related to parking availability in Yosemite Valley, as traffic circulation significantly slows when parking lots fill. Circulation problems also arise from the location and design of key intersections and conflicts between pedestrian crossings and vehicle throughways.

East Yosemite Valley currently has approximately 5,000 parking spaces, with about 4,000 available to visitors (the rest are in areas generally designated for administrative or employee/resident use). Transportation models examined parking supply options from 4,000 spaces (3,000 for visitors) to 6,500 spaces (5,500 for visitors). Urban transportation planners generally assume 85% of a parking supply can be utilized efficiently; parking filled at higher levels makes it difficult for drivers to find, enter, or leave spaces without creating bottlenecks. In East Yosemite Valley, where most visitor parking occurs in a few larger lots that can be managed more efficiently (particularly during the peak-use times), 90% occupancy is assumed in all alternatives.

**Summary:** Taken together, transportation performance indicators and standards define “how much congestion is too much” on the Valley’s roads and in its parking areas. Transportation modeling shows how these standards can be met with different levels of use and amounts of infrastructure, all while protecting river values. This approach provides NPS, stakeholders, and the public with an opportunity to make an informed decision about the different use levels presented in the alternatives in Chapter 8.

### ***Overview of Capacities***

Table 6-5 summarizes the capacities for the Valley segment across alternatives. These are expressed in terms of the maximum number of people at one time that can be received. Following the table is an explanation of the assumptions.

**TABLE 6-5: SUMMARY OF USER CAPACITIES BY ALTERNATIVE: YOSEMITE VALLEY**

Alternatives	1	2	3	4	5	6
	Current management or "No action"	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
<b>Visitor overnight capacity</b>						
Camping	2,892	2,916	2,958	4,398	4,032	4,626
Lodging	3,672	1,842	2,069	2,826	3,697	4,380
<b>Total</b>	<b>6,564</b>	<b>4,758</b>	<b>5,027</b>	<b>7,224</b>	<b>7,729</b>	<b>9,006</b>
<b>Visitor day-use capacity</b>						
Day parking	7,260	5,858	5,328	6,497	7,549	7,941
Regional transit	293	241	241	337	684	788
Tour buses	720	720	720	720	720	720
<b>Total</b>	<b>8,272</b>	<b>6,819</b>	<b>6,289</b>	<b>7,554</b>	<b>8,954</b>	<b>9,449</b>
<b>Administrative capacity</b>						
Employee housing	1,315	658	1,086	1,087	1,136	1,136
Employee day parking	332	332	332	332	332	332
<b>Total</b>	<b>1,647</b>	<b>990</b>	<b>1,418</b>	<b>1,419</b>	<b>1,468</b>	<b>1,468</b>
<b>TOTAL SEGMENT CAPACITY</b>	<b>16,483</b>	<b>12,567</b>	<b>12,734</b>	<b>16,197</b>	<b>18,151</b>	<b>19,923</b>

### Visitor Overnight Capacity

Overnight user capacities are calculated differently depending on the type of accommodations provided. For lodging, overnight capacities are based on the "pillow count" (the capacity) of the rooms comprising the four properties in Yosemite Valley (the Ahwahnee, Housekeeping Camp, Curry Village, and Yosemite Lodge). Pillow count at the Ahwahnee is 326 people across all alternatives (the same as at present); all cabins at Housekeeping Camp have a capacity of four; and at both Curry Village and Yosemite Lodge, rooms average 3.5 pillows. Overnight capacity for campgrounds is calculated by multiplying the number of campsites by the maximum number of people per site. For individual campsites the maximum number of people per individual site is six, for group sites it is 30.

For Alternative 5, 326 people would be at the Ahwahnee + 928 at Housekeeping Camp (232 rooms x 4) + 1,586 at Curry Village (453 rooms or cabins x 3.5) + 857 at Yosemite (245 rooms x 3.5), for a combined total of 3,697. Camping capacities would be a 3,792 overnight visitors in the individual campsites (632 sites x 6 people/site), plus 240 in group sites (8 group sites x 30 people/site), for a combined total of 4,032.

The combined overnight capacity of Alternative 5, therefore, equals 7,729 people at one time: 4,032 campers plus 3,697 persons in lodging.

### Visitor Day-use Capacity

Visitor day-use capacity is a combination of people arriving by private vehicle, those arriving by transit buses (public transportation), and those arriving by tour buses.

Private vehicle numbers include both parked vehicles and those in circulation. This analysis assumes an average occupancy rate of 2.9 people per vehicle. For parked cars, the total number of day-use parking spaces is computed and then multiplied by 90 percent, because not all spots are filled at any one time (as explained above, this is the percent of spaces that can feasibly be occupied for efficient utilization). The

assumption for vehicle circulation is that 400 vehicles are on Valley roads at any one point in time which is consistent with transportation models depicting unimpeded traffic flow.

Alternative 5 features 2,448 day-use parking spots for visitors. This number multiplied by 2.9 people per vehicle and a 90 percent utilization rate provides capacity for 6,389 people at one time. Additionally, 400 cars are assumed to be in circulation under all alternatives, providing capacity for an additional 1,160 people ( $400 \times 2.9$ ). Together, parking and circulating vehicles yield a capacity of 7,549 people at one time for day-use.

Transit buses both arrive and depart Yosemite Valley, with arrivals primarily in the morning hours and departures in the afternoon hours. Some passengers are employees, who are not included in visitor counts. More commuting employees travel via Highway 140 than Highway 41. To estimate the visitor component of this bus capacity, maximum transit counts for the Highway 140 and 41 runs were multiplied by 80 percent for the Highway 140 runs and 90 percent for the Highway 41 runs. There is also overlap between arrivals and departures, with some buses arriving after the first few have left. To account for this overlap, the maximum number of people that can arrive by transit bus is multiplied by 60 percent. Only 90 percent of these visitors are *day users*, however; an estimated 10 percent are overnight guests already included in the overnight capacities reported above.

For the Alternative 5, the above transit bus visitor calculations yield the following results: Highway 140 yields 276 visitors at maximum ( $12 \text{ roundtrips} \times 48 \text{ people per bus} \times 80\% \text{ visitors} \times 60\% \text{ inbound accumulation}$ ); Highway 41 yields 311 visitors at maximum ( $12 \text{ roundtrips} \times 48 \text{ people per bus} \times 90\% \text{ visitors} \times 60\% \text{ inbound accumulation}$ ); and the two Highway 120 routes (6 runs combined) yield 173 visitors at maximum ( $6 \text{ roundtrips} \times 48 \text{ people per bus} \times 100\% \text{ visitors} \times 60\% \text{ inbound accumulation}$ ). Collectively, these numbers yield a combined transit capacity of 760. Multiplying 760 by 90 % to account for overnight guests, yields a final day-use transit bus capacity of 684.

Tour bus visitor numbers are computed by multiplying the maximum number of buses that can be accommodated at one time by the maximum number of people per bus (48 people). For all alternatives, the maximum number of buses that can be parked in the Valley is 15, for a total capacity of 720 people at one time.

Again, visitor day-use capacity is the sum of the maximum number of visitors at one time arriving by private vehicle, regional transit, and tour bus. For Alternative 5, adding 7,549 people in private vehicles to 684 in transit buses and 720 in tour buses gives a total day-use capacity of **8,954** (rounding adds one person to the combined number).

### **Administrative Capacity**

Administrative capacity is calculated by summing the total number of employee beds provided within each segment and adding the number commuting into the segment. The additional day parking capacity for administrative use is calculated by multiplying the number of administrative parking spaces by an average of two people per vehicle (reflecting the fact that employees are usually not traveling with their families or friends, but other coworkers going to the same duty station).

For Alternative 5, a total of 1,136 employees reside in the segment, including NPS (164) and concessioner (972) employees. There are an additional 166 employee commuter parking spots; multiplying that number by 2 yields an additional 332 employees, for a total administrative capacity of 1,468 people at one time.

## Capacity Management

Use and development in Yosemite Valley are multifaceted, and user capacities to manage them are similarly complex. Information related to user capacities is provided in Table 6-6. For each alternative, this table and the following sections of explanation summarize key infrastructure metrics that are highly correlated with user capacities, as well as regulations or other management actions that work with user capacities to protect and enhance river values.

**TABLE 6-6: SUMMARY OF KEY USER CAPACITY MANAGEMENT ACTIONS: YOSEMITE VALLEY**

Alternatives		1	2	3	4	5	6
		Current conditions	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
<b>Infrastructure</b>							
Lodging units		1,034	556	621	823	1,053	1,248
Camping		466	450	477	701	640	739
Roads and bridges		6 total	3 removed	3 removed	2 removed	1 removed	0 removed
Intersections		4-way	4-way	4-way	4-way	1 Round-about	2 Roundabouts
Pedestrian crossings	Yosemite Lodge	On grade	On grade	On grade	On grade	Underpass	Underpass
	Yosemite Village	On grade	On grade	On grade	On grade	On grade	Underpass
Length of fencing to protect sensitive areas (ft)		33,570	Same as Alt 1	Same as Alt 1	17,765 additional	17,765 additional	21,560 additional
<b>Policy and Regulation</b>							
Lodging capacities		Concession operated, available by reservation					
Camping capacities		NPS operated by combination of reservation system and first come-first served					
East Valley traffic diversion		Yes	No	No	No	In future if needed	In future if needed
East Valley day-use parking permit system		None	Yes	Yes	Yes	In future if needed	In future if needed
Food storage regulations		Food storage regulations at campgrounds and other areas in the Valley would continue.					

## Infrastructure

The number of lodging and camping units across the alternatives varies, providing a different mix of overnight accommodations in each. Lodging varies according to proposed reductions in units at Curry Village, Housekeeping Camp, and Yosemite Lodge. Similarly, campsites are removed or relocated away from the river to varying degrees. Some camping areas are restored and campsite numbers increased in the Valley, depending on the theme of the alternative. Other key infrastructure options include the consideration of roundabouts and pedestrian underpasses at the Yosemite Lodge and Yosemite Village Day-use Parking Lot areas. These developments are proposed to mitigate impacts to the recreational ORV associated with crowding and congestion. Finally, to further protect river values from pedestrian foot traffic, additional fencing is proposed in Alternatives 4, 5, and 6.

## Policy and Regulation

**Lodging reservation system.** Overnight lodging use in Yosemite Valley is limited to the maximum occupancy of each lodging unit. Lodging units are managed by a concessioner and are available with advanced reservations. The concessioner operates the system as follows:

- Limited numbers of rooms of different configurations (numbers/sizes of beds).
- Maximum numbers of occupants for different types of rooms.
- No “minimum” number of occupants; some groups may not use the full capacity.
- Reservations can be made up to one year in advance.
- Maximum stay per reservation is seven nights.
- Variable pricing for different rooms and locations.
- Limit of two vehicles per room at Housekeeping; no explicit limits for other accommodations.

**Campground reservation system.** Campgrounds in Yosemite Valley are limited and available on a reservation system. The system includes:

- Specified numbers of campsites in different campgrounds.
- Maximum of six campers and two vehicles allowed per drive-in site (all of the Pines Campgrounds) and six campers allowed at walk-in sites (Camp 4 and Backpackers Camp).
- At walk-in camps, NPS may combine smaller groups to efficiently utilize space in a campground.
- Reservations can be made up to six months in advance.
- Maximum stay per reservation is seven nights.

**Day-use traffic diversions.** On high-use days in recent years, the park traffic operations team has periodically instituted a traffic diversion at the El Capitan Crossover (the mid-point of the Valley) to re-direct incoming traffic away from the East Valley. The diversion is currently triggered by full day-use parking lots or very long queues at East Valley intersections, especially those at the Yosemite Village Day-Use Parking Area entrance and the Lodge pedestrian crossing. Rangers meet additional vehicles entering the Valley at the junction of Southside Drive and El Capitan Crossover and guide them to other destinations in the park before returning to the El Capitan Crossover. Rangers give drivers a time-stamped card when first met; drivers who show the card after spending time elsewhere in the park are allowed to enter the traffic queue into the East Valley later in the day.

This is a first-come/first-served, on-site limit, with a delay component. Anecdotal data suggest it is currently used when daily inbound traffic levels to the East Valley exceed approximately 6,500 vehicles. These diversions are not formally announced or tracked and implementation is at the discretion of the traffic manager, with the goal being to avoid gridlock so that emergency vehicles can move quickly. The alternatives presented in Chapter 8 offer different approaches to addressing day-use traffic. The lower-use alternatives (2, 3, and 4) include a day-use parking reservation system for East Yosemite Valley that would eliminate the need for on-site East Valley traffic diversions. In Alternatives 5 and 6, infrastructure changes (e.g., better intersections, more parking, improved pedestrian crossings, better wayfinding) will reduce the need to rely on ad hoc measures, although demand may exceed supply on some days and eventually necessitate implementation of a formal system.



**East Valley Day-use Parking Permit System.** The need for a permit system depends on the amount of day-use parking each alternative provides in relation to the peak visitation levels in those alternatives. Alternatives 2, 3, and 4 would immediately require a system to manage day-use levels in the East Valley because at-one-time visitation demand would be substantially higher than parking availability in these alternatives. In contrast, Alternatives 5 and 6 would provide sufficient day-use parking supply to accommodate some increase beyond current peak day-use levels. In these higher-use alternatives a day-use parking permit system would be implemented in the future if conditions become “unacceptable,” as defined below. Emphasis would be placed on instituting indirect management of day-use traffic first, before moving to a parking permit system. Such indirect management includes information sharing, transit incentives, and transportation system mode sharing to redistribute traffic away from the congested areas of East Yosemite Valley.

For Alternatives 5 and 6, an East Valley Day-use Parking Permit System will be implemented when conditions reach the point where: (1) day-use visitation to the East Yosemite Valley from private vehicles exceeds the parking availability; and (2) formal traffic diversions at El Capitan Crossover have been implemented for at least 14 days during the summer season for two consecutive years.

In general, a day-use parking permit system for East Yosemite Valley will take into account the following:

- **Seasonality** – The permit system would be instituted during the peak-use summer season and daylight hours only.
- **Allocation** - The system would ensure fair and equitable allocation of permits to all visitors on a mixed first-come, first-served and advanced reservation basis.
- **Distribution** – Permits would be available by multiple means including through the Internet, by telephone, and in person.
- **Permit Compliance** – Permits may be checked at park entrance stations and/or on-site at day-use parking areas in the Valley.
- **Costs and Fees** – The permit system will need to address the costs of administration and whether fees would be required.
- **Thru Traffic and other Considerations** - The permit system would need to take into account the various types of day users to the Valley including administrative traffic, pass-thru travelers, special events and groups, etc. Similarly, development of the permit system will also need to address the economic implications (both positive and negative) for gateway communities.

**Other Management Actions.** Several other management actions in this segment would also address visitor impact issues in concert with user capacities. Many are already in place, however education and regulation enforcement will need to be emphasized in higher use alternatives. Actions common to all alternatives include:

- Proactive on-site management program for day-visitor traffic and parking.
- Camping restrictions (in designated areas only).
- Fire restrictions (hours of the day) to reduce smoke.
- Food storage restrictions (mandatory bear-resistant storage rather than in cars or rooms).
- Regular trail and camping area maintenance to mitigate site impacts (e.g., trail cutting, camp boundary encroachment, etc.).
- Split rail fencing, boardwalks, and defined trails as needed to minimize informal trails and other site impacts.

- Improved signage and wayfinding.

Several other management actions to address user capacity-related issues vary across alternatives. These include:

- Additional split-rail fencing, boardwalks, and defined trails to minimize informal trails and other site impacts.
- Eliminating pack stock stables and commercial day rides from the Valley.
- Eliminating commercial rafting from the Valley.
- Changes to the number and location of parking spaces.
- New intersection improvements (e.g., roundabouts).
- Adding below-grade pedestrian crossings.
- Extending the Valley shuttle to Bridalveil Fall.

These actions address many biophysical, scenic, or transportation impacts from the amount of use, while adjustments to capacities more directly responds to desired social conditions at attraction sites or beaches.

## ***Conclusion***

Primary user capacity decisions in Yosemite Valley involve choices among the amount of use, infrastructure to support that use (especially lodging, campground, and day-use parking lots), and social conditions as to what use levels are acceptable (densities at attraction sites, roadway travel times, and parking availability). There are also choices between levels of facility development and meadow and riparian restoration.

Tradeoff examples include:

- In the lower-use alternatives, densities at attractions are closer to “preference evaluations” than “acceptability” evaluations. Higher-use alternatives allow more access, but conditions may be less desirable, though still within the acceptable range.
- Alternative 2 eliminates the Lodge and Housekeeping Camp as overnight destinations. This allows greater restoration (improves riparian or meadow conditions), but reduces overnight capacity (the number of people who can stay overnight in those types of lodging). It also changes the type of use in those areas to lower density day-use. Alternatives 5 and 6, meanwhile, provide for a level of accommodations similar to today’s, with less (but still significant) restoration than Alternative 2.
- Overnight vs. day-use. More parking or development for one type of use may mean less for another (if the amount of total developed area is held constant). The largest contrasts are between Alternatives 2 (much lower overnight and day use) and Alternative 6 (higher overnight use; roughly static day use).

## **Segment 3: Merced Gorge**

### ***Management Goals and Considerations***

Management goals with capacity implications for the Merced Gorge include: (1) protecting natural processes; (2) promoting visitor enjoyment; and (3) reducing crowding and congestion. The single ORV in this segment is scenery (ORV 18), which features views of “towering cliffs and peaks. . .near continuous cascades. . .and a narrow gorge. . .littered with massive boulders.” These scenic features are not affected by the amount of visitor use, although infrastructure in support of recreation use (e.g., the El Portal Road and

Arch Rock entrance gate) could have some effects on scenic quality. In the absence of ORVs that are sensitive to use levels, capacities are based on standards for high-quality recreation and transportation system performance that are appropriate to this scenic corridor and National Park frontcountry settings.

A review of baseline and existing conditions, monitoring reports, information from staff, and public involvement information identified three user capacity-related issues for this segment:

- Traffic congestion at the Arch Rock entrance gate.
- Crowding and parking availability at specific turnouts popular for: (1) climbing in spring and fall; and (2) relaxing, swimming, and fishing during low water periods.
- Bank trampling and erosion at specific turnouts.

The primary constraints to the kinds and amounts of use in the Gorge segment are the roadway that parallels the river, the number of pull-outs that provide access to it, and the condition of the riverbanks. Most road traffic passes through the segment *en route* to other destinations within or outside the park (depending on the direction of travel). Two-way traffic volumes along this road (not including the entrance gate queues) have not created noticeable congestion, even during peak-use periods.

A limited number of pull-outs and two larger parking lots (13 and 23 spaces per lot, respectively) provide access to the river along this segment. Use in this area is primarily made up of short duration stops by passing vehicles. However, some visitors engage in longer visits that include more immersive recreational activities (e.g., climbing, relaxing, swimming, or fishing). For example, the pull-outs near Arch Rock, Cookie Cliff, and Ribbon Falls are popular for climbing.

Most pull-outs in this segment have been redeveloped and properly designed to reduce impacts to river values. A few popular swimming-related pull-outs, however, have some parking and bank trampling impacts. The *Merced River Plan/DEIS* proposes actions to provide appropriate access, restore trampled vegetation, reduce erosion, and protect river banks.

### ***Indicators and Standards***

The transportation indicator for Yosemite Valley (Segment 2) helped inform user capacity decisions for this segment; it is designed to monitor the ease of access to scenic viewing and other recreation opportunities. This indicator measures parking availability and congestion at turnouts and parking areas. The segment has approximately 180 spaces, depending on size of vehicles and how efficiently unmarked turnouts are used. All alternatives keep this number static and assume 90 percent of spaces can be used efficiently (parking filled at higher levels makes it difficult for drivers to find, enter, or leave spaces without creating bottlenecks).

Relationships between use levels and crowding are direct and linear: more vehicles stopping in the segment will fill the available parking spaces, while more vehicles on the road will decrease average space per vehicle and increase chances of congestion (traffic jams). Using these relationships, park planners assessed the number of vehicles that can be accommodated at one time while meeting identified standards. Based on analyses of traffic levels associated with capacities in the Valley and the proportion of use that is likely to arrive via the Gorge, even the highest use alternatives in the DEIS do not approach “pass through” capacities in this segment (DEA 2012).

The limiting factor for capacity in this segment is parking availability, which constrains the number of visitors that can “stop and stay” in the segment at one time (about 600 visitors). Much higher use levels can

pass through the segment on the El Portal Road, while adhering to a “free-flow” standard. Current peak use averages over 300 vehicles and about 1,000 people per hour, while the “free-flow” standard would allow nearly double this level without unacceptable congestion (DEA 2012).

### *Overview of Capacities*

Table 6-7 provides a summary of the capacities for the Gorge segment. Because no overnight use occurs in this segment, only day-use capacity is reported below.

**TABLE 6-7: SUMMARY OF USER CAPACITIES BY ALTERNATIVE: MERCED GORGE**

Alternatives	1	2	3	4	5	6
	Current management	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
<b>Visitor day-use capacity</b>						
People at one time from parking areas	470			470		
People at one time on roadway	399			399		
<b>Total</b>	<b>869</b>			<b>869</b>		
<b>Administrative capacity</b>						
Employee housing	9			9		
Administrative day parking	4			4		
<b>Total</b>	<b>13</b>			<b>13</b>		
<b>TOTAL SEGMENT CAPACITY</b>	<b>882</b>			<b>882</b>		

Most administrative capacities refer to people spending the night or working at the Arch Rock entrance gate during the day. All user capacities and administrative use on roads are expressed as people at one time. Parking availability assumed 90% occupancy and 2.9 people per vehicle. It was also assumed that transit and tour buses do not stop at turnouts (transit does not stop due to schedule constraints and tour buses are prohibited from stopping). Road circulation calculations assume 20 vehicles per mile over a 6.9 mile segment to maintain the free flow of traffic.

Administrative use levels at the Arch Rock entrance station were associated with the existing employee room and bed configurations (nine beds) and day-use parking availability (two spaces for four staff).

### *Capacity Management*

This seven-mile segment has no history of established user capacities. User capacities and management actions are the same for all alternatives. Existing parking is sufficient for likely future demand and will not cause unacceptable impacts to river values, even with use in the Valley as high as that proposed in Alternative 6. Proposed actions common to all alternatives include:

- Addressing bank erosion at specific turnouts popular for swimming and relaxing; these involve designating specific parking spaces and trail redesign to minimize riparian trampling impacts.
- Organizing paved turnouts with designated spaces to improve efficiencies and avoid congestion at parking areas.

No alternative examined user capacities higher than present use.

## ***Conclusion***

There are no major user capacity choices in the Gorge segment across the alternatives. As reflected in Chapter 8, the NPS has determined the existing roadway, parking areas, and entrance gate facilities are causing no adverse impacts to river values. Similarly, the use levels that fit with those facilities occur without unacceptable congestion or other impacts on river values. Other management actions address the site-specific visitor use impacts that can be controlled by improved parking and trail design.

## **Segment 4: El Portal**

### ***Management Goals and Considerations***

Use of the El Portal Segment is primarily focused on administrative functions and community activities. The vast majority of this activity occurs in upland developed areas that are set back from the river, although some recreation use occurs in the river or along its banks. Similar to the Gorge segment, several roadside pull-outs provide access to the river for recreational activities. Primary activities are swimming, fishing, and boating, all of which are seasonal in nature.

Management goals related to capacity for El Portal include: (1) protecting natural processes; (2) promoting visitor enjoyment; and (3) reducing crowding and congestion. The only ORVs in this segment are the El Portal Archeological District and the El Portal boulder bar. Neither is affected by the amount of visitor or administrative use, although cultural values are affected by the location of visitor facilities as discussed in Chapter 5. In the absence of ORVs that are sensitive to use levels, capacities were based on standards for high-quality recreation appropriate to National Park frontcountry settings.

The primary constraints to the kinds and amounts of use in the El Portal segment are resource constraints and site suitability. These include topography, floodplains and riparian areas, cultural resource sites, and rare or sensitive plant and animal populations. Similar to Yosemite Valley, these resource issues limit the amount of land available for visitor or administrative activities and related structures. Areas that would accommodate additional use have been identified and included in the plan alternatives.

### ***Indicators and Standards***

The parking availability indicator for Yosemite Valley (Segment 2) helped inform user capacity decisions for this segment. The El Portal segment has approximately 290 spaces, depending on size of vehicles and how efficiently unmarked turnouts are used. All alternatives keep this number static and assume 90 percent of spaces can be used efficiently (parking filled at higher levels makes it difficult for drivers to find, enter, or leave spaces without creating bottlenecks).

Administrative use capacities in residential areas were based on staffing needs and available housing, which vary by alternative and typically derive from decisions about employee numbers and housing in Yosemite Valley. Full occupancy of the employee housing in this segment is assumed.

Relationships between use levels and crowding are direct and linear. More vehicles stopping in the segment will fill the available parking spaces, while more vehicles on the road will decrease average space per vehicle and increase chances of congestion. Using these relationships, park planners assessed the number of vehicles that can be accommodated at one time and meet standards (see assumptions below). Based on

analyses of traffic levels associated with capacities in the Valley and the proportion of use that is likely to arrive via El Portal, even the highest use alternatives in the DEIS will not approach pass-through capacities in this segment (DEA 2012).

Although park planners considered all river values and related site constraints in this segment in developing capacities, the limiting factor is parking availability, which constrains the number of visitors that can “stop and stay” in the segment at one time (about 500 visitors). Much higher use levels can pass through the segment on the El Portal Road, even at a “free-flow” standard (current high-user periods average over 300 vehicles and about 1,000 people per hour, but the “free-flow” standard would allow nearly twice this level without unacceptable congestion).

### *Overview of Capacities*

There is no visitor overnight use in this segment (Yosemite View Lodge is private land outside the scope of this planning effort), and most visitors pass through the segment on their way into or out of the park. For most, the recreation experience is scenic driving, but some make short stops at turnouts, and others make longer stops to relax, swim, or fish (especially during low water periods in mid- to late summer). There is some commercial use associated with the store, gas station, and Yosemite View Lodge restaurants. There is considerable administrative use associated with NPS housing, NPS administration facilities, and “commuters” living in El Portal who work in other parts of the park.

For this segment, the *Merced River Plan/DEIS* proposes common-to-all user capacities for people in vehicles for scenic driving or administrative purposes, and for out-of-vehicle recreation opportunities. However, administrative residential and day-use capacities vary by alternatives. A summary of user capacities by alternative is provided in Table 6-8. All visitor capacities refer to people at one time. Administrative capacities refer to number of people spending the night in residential housing or working at NPS facilities during the day. All user capacities for circulating on roads include visitor and administrative use and are expressed as people at one time.

**TABLE 6-8: SUMMARY OF USER CAPACITIES BY ALTERNATIVE: EL PORTAL**

Alternatives	1	2	3	4	5	6
	Current management	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
Visitor day-use capacity						
People at one time from parking areas	559	559				
People at one time on roadways	181	181				
Total	740	740				
Administrative capacity						
People in residential housing	192	618	223	300	288	506
Administrative staff PAOT	1,220	1,220				
TOTAL SEGMENT CAPACITY	2,152	2,578	2,183	2,260	2,248	2,466

Specific calculation assumptions include:

- Parking availability assumed 90 percent occupancy, 2.9 people per vehicle and that transit and tour buses do not stop at turnouts in this segment.

- Road circulation calculations assume 20 vehicles per mile over a 3.1 mile segment to meet the “free-flow” standard.
- Use levels at various employee residential areas were associated with the existing or proposed room and bed configurations, or administrative day-use parking availability (2 people per vehicle/parking space).

### ***Capacity Management***

This short segment has no history of established user capacities. Day-use capacities are the same for all alternatives. Existing parking is sufficient for likely future demand and will not cause unacceptable impacts to river values, even with use increases in the Valley as proposed in Alternative 6. Proposed actions common to all alternatives include:

- An additional public restroom would be built in Old El Portal to accommodate visitors recreating in this segment.
- NPS would construct duplexes (as infill) in El Portal Village Center to house up to 12 employees.

No alternative examined visitor user capacities higher than present use; all alternatives consider increasing the amount of employee housing. Also, some alternatives consider a day-use parking area at Abbieville. This parking area would provide overflow parking and transit service to the Valley. Otherwise, this segment would continue to serve as the park’s administrative site.

### ***Conclusion***

There are no major user capacity tradeoffs in El Portal. NPS has identified acceptable visitor infrastructure levels (current roadway and parking area configuration), and has identified use levels that fit with those facilities without unacceptable congestion or other impacts on river values. The only differences in alternatives are the amount of employee housing, which are driven by Valley housing availability (in higher use alternatives, more Valley employees will commute from housing in El Portal).

## **Segment 5: South Fork Merced River Above Wawona**

### ***Management Goals and Considerations***

Management goals related to user capacity in this segment include: (1) protecting natural processes; and (2) promoting visitor enjoyment. There is no recreation ORV in this segment, and use-related impacts that might affect the segment’s biological, archeological, and scenic outstandingly remarkable values (see Chapter 2) are localized and site-specific and more likely to be caused by the type rather than the amount of use.

The entire reach is in designated Wilderness. As with other Yosemite backcountry areas, NPS manages for solitude-oriented recreation experiences. Overnight visitor use is currently limited through a trailhead quota and permit system.

A review of baseline and existing conditions, studies, monitoring results and public comment identified few specific visitor or administrative use issues for the corridor. Designated trails cross the corridor in only three

places, there are very few commonly used dispersed camps, and none are likely to have substantial site-specific impacts at current or proposed use levels.

Other management considerations that affected user capacity decisions in this segment include wilderness encounters and related recreational experiences. As described by the Wilderness Act, outdoor recreation in the Merced River's wild segments is primarily oriented toward "outstanding opportunities for solitude or a primitive and unconfined type of recreation." Therefore, the degree of interaction with other visitors can be a constraint on the amount of use that may be accommodated in this segment.

### *Indicators and Standards*

Capacities in this segment were based on trail encounters with other groups. Encounters have a long history of management and research attention in backcountry areas (Vaske et al. 1986; Shelby et al. 1996; Manning 2010). In higher density settings (including above Nevada Fall), the measure has focused on encounters *per hour*. In lower density backcountry areas such as the South Fork above Wawona, considerable research suggests standards for "wilderness experiences" should be less than five encounters *per day* (Vaske et al. 1986).

Based on research from several locations, relationships between use and trail encounters in this segment are likely to be direct and linear. Trail encounter standards have been set at five or less per day for all alternatives; these standards are unlikely to be exceeded with current overnight and day-use levels.

### *Overview of Capacities*

The *Merced River Plan/DEIS* proposes no changes in overnight visitor capacities for this segment, but considers day use and administrative use for completeness. A summary of user capacities is provided in Table 6-9. Visitor capacities in this table refer to people spending the night in or near the segment (overnight use), or using it for part of one day (day-use); encounters between these groups would most likely occur while traveling during the day.

Administrative use up to five people per day is associated with wilderness patrols, trail crews, or search and rescue operations. All capacities for visitor and administrative use are the same across alternatives, and they will protect or enhance visitor experiences by ensuring that trail encounters will not exceed the standards set for the corridor.

**TABLE 6-9: SUMMARY OF USER CAPACITIES FOR ALL ALTERNATIVES: MERCED CORRIDOR ABOVE WAWONA**

Wilderness Capacities		Comments
<b>Wilderness zone capacities</b>		
Zone 50, South Fork	15	Trail crosses corridor. Very little, if any cross-country use. Corridor is less than 15% of zone. Most camping is outside river corridor. Zone overnight capacity is 150 people per night.
Zone 51, Johnson Creek	5	No designated trails in corridor. Some rare cross-country use. Corridor is less than 5% of zone. Zone capacity is 50 people per night.
Zone 52, Chilnualna Creek	0	No designated trails in corridor. No known use. Corridor is less than 10% of zone. No camping allowed in corridor (within 4 miles of Wawona).
<b>Total</b>	<b>20</b>	
<b>Administrative capacity</b>	<b>5</b>	Estimated based on a limited number of wilderness patrols.
<b>TOTAL SEGMENT CAPACITY</b>	<b>25</b>	



## ***Capacity Management***

Proposed capacities would be managed through the backcountry permit system, which limits people per day using different trailheads; the capacities are the same for all alternatives. Other details about the permit system are provided earlier in this chapter under the section pertaining to the Merced River above Nevada Fall.

Plan alternatives propose no changes to infrastructure (trails, bridges, or related development). However, similar to the Merced above Nevada Fall, several Wilderness management actions work with capacities to protect and enhance river values. These are common across all alternatives:

- Overnight group size limits: 15 for backpacking groups on trails, 8 cross-country; 25 stock + people for stock groups on trails.
- Camping restrictions: Camp farther than 100 feet from water; no camping within 4 miles of Wawona.
- Day use group size limit of 35 people
- Leave-No-Trace regulations:
  - No fires above 9,600 feet; fires must be in designated fire rings
  - Mandatory bear-resistant food canisters
  - Carry out all trash
  - Bury human waste
  - No bicycles/strollers
  - No mechanized or motorized travel
- Regular trail and camping area maintenance addressing site impacts (e.g., trail cutting, campsite boundary encroachment, etc.).

## ***Conclusion***

There are no user capacity tradeoffs in the segment above Wawona; all alternatives maintain the same encounter standards and existing low-use levels. This part of the corridor provides very low density, solitude-oriented recreation experiences and minimal visitor-related impacts, and no stakeholder or public input has advocated higher-use alternatives.

## **Segments 6 and 7: Wawona and Wawona Impoundment**

### ***Management Goals and Considerations***

Management goals related to user capacity in this segment include: (1) protecting natural processes; and (2) promoting visitor enjoyment.

The pertinent outstandingly remarkable values in this segment are biological and cultural. The biological ORV includes the Sierra sweet bay (*Myrica hartwegii*), a rare plant found on river banks of the South Fork Merced River. Uses proposed in the plan alternatives are diverted away from sensitive areas, and fencing, signing, and education are proposed to further protect this ORV.

For the cultural ORV, remains of the U.S. Army Cavalry Camp A.E. Wood document the Yosemite legacy of the African-American buffalo soldiers and the strategic placement of their camp near the Merced River. Campsites currently within this historic area would be removed in some *Merced River Plan/DEIS* alternatives, affecting the overnight capacity of the campground.

Other factors that limit the kinds and amounts of use that can be accommodated in the Wawona segment include the following:

***Resource constraints and site suitability.*** As with the other developed areas in the corridor (Yosemite Valley and El Portal), resource constraints and overall site suitability factor into the constraints on the maximum amounts of use that may be accommodated in the Wawona segment. In this segment, these constraints include topography, floodplains and riparian areas, rare and sensitive plant and animal populations, and cultural resource sites. Collectively, the various resource constraints and limited availability of land in the river corridor in Wawona are a limiting factor for visitor and administrative uses in this area.

***Water consumption.*** Water use and treatment are a limiting factor to the overall kinds and amounts of use in the Wawona segment. Currently the water supply for the Wawona area is drawn from four potable water systems and multiple private wells. One distribution system is operated by the National Park Service and involves drawing surface water from an impoundment on the South Fork Merced. Under its Regional Water Quality Control Board permit, this system is designed to draw a maximum of 480 gallons per minute or 1.1 cubic feet per second. To protect in-stream flows for aquatic habitat, mandatory water conservation measure are implemented whenever the river reaches flows of less than 6 cubic feet per second. At flows of less than 6 cubic feet per second, diversions are limited to 10 percent of the river flow.

### ***Indicators and Standards***

The parking availability indicator for Yosemite Valley (Segment 2) helped inform user capacity decisions for this segment. The segment has approximately 290 spaces, depending on size of vehicles and how efficiently unmarked turnouts are used. All alternatives keep this number static and assume 90 percent of spaces can be used efficiently (parking filled at higher levels makes it difficult for drivers to find, enter, or leave spaces without creating bottlenecks).

Administrative use capacities in residential areas were based on staffing needs and available housing, which are the same across the alternatives for this segment. Full occupancy of the available employee housing is assumed.

Relationships between use levels and crowding are direct and linear. More vehicles stopping in the segment will fill the available parking spaces, while more vehicles on the road will decrease average space per vehicle and increase chances of congestion. Using these relationships, park planners assessed the number of vehicles that can be accommodated at one time and meet standards (see assumptions below) (DEA 2012).

Although park planners considered all river values and related site constraints in this segment in developing capacities, the limiting factor is parking availability, which constrains the number of visitors that can stop and recreate in the segment at one time (about 911 visitors).

### ***Overview of Capacities***

Table 6-10 presents an overview of the capacities proposed for the Wawona segment across the alternatives.

**TABLE 6-10: SUMMARY OF USER CAPACITIES BY ALTERNATIVE: WAWONA**

Alternatives	1	2	3	4	5	6
	Current management	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
Visitor overnight capacity						
Wawona Hotel	247	247				
Wawona Campgrounds	618	426	456	456	540	540
Visitor day-use capacity						
Day parking	911	911				
Regional transit	0	26	26	104	311	311
Tour buses	384	384				
Administrative capacity						
Employee housing	121	121				
Administrative day use	60	60				
TOTAL SEGMENT CAPACITY	2,368	2,175	2,205	2,205	2,574	2,574

### Visitor Overnight Capacity

All alternatives would retain the Wawona Hotel at its current capacity of 104 rooms, accommodating a maximum of 247 people per night. The Wawona campground has different user capacities in different alternatives, depending on the number of sites moved away from both the river and the A.E. Wood cultural site. Maximum capacities of the campground are 384, 414, and 498 people per night, compared to the current capacity of 576 people per night. Campground user capacity is calculated by multiplying the number of sites times the maximum of six people per site. Additionally, each action alternative includes one 30-person group site at the Wawona Campground. Segment 7 also has two stock camps that accommodate up to six people per night at each.

### Visitor Day-use Capacity

Day-use capacity in Wawona varies according to the amount of regional transit provided along this corridor in each alternative. Based on the number of inbound bus runs through this segment each day, the maximum number of people at one time from regional transit in Wawona varies from zero in Alternative 1 to 311 in Alternative 6 (the calculations are similar to those in Segment 2, above, with no employees assumed as riders; for example, the preferred alternative has 12 roundtrips per day, with 48 passengers per bus, multiplied by the 60 percent turnover rate and 90 percent day-use factor, for 311 total). The maximum day-use associated with private vehicle parking remains the same across all alternatives, at approximately 911 people at one time (290 parking spaces multiplied by an average of 2.9 people per vehicle, then by 90 percent, with 154 people in circulating cars added to reach 911). The maximum number of people at one time arriving from tour buses is consistent across the alternatives at 384 people (8 tour bus parking spaces multiplied by a maximum of 48 people per bus).

## Administrative Capacity

Administrative use is broken down between employees residing in housing within the corridor and those that use day-use parking not associated with residential areas or visitor parking. Residential capacity for all of the alternatives is 121 employees. Day parking for administrative use would accommodate an additional 60 employees (30 parking spaces multiplied by an average of two people per vehicle, reflecting the fact that employees are usually not traveling with their families or friends, but other coworkers going to the same duty station).

## Capacity Management

This section provides an overview of the key capacity management actions for the Wawona segment. It focuses on infrastructure decisions along with policy and regulation measures that will be taken to ensure the kinds and amounts of use proposed do not adversely affect river values. Again, these are a subset of the full suite of actions being taken in each alternative to protect river values (see Chapters 5 and 8, for example). Table 6-11 presents a summary by alternative of the key capacity management actions for the Wawona segment.

**TABLE 6-11: SUMMARY OF KEY USER CAPACITY MANAGEMENT INFORMATION: WAWONA**

Alternatives	1	2	3	4	5	6
	Existing situation	Self-reliant experiences and extensive floodplain restoration	Dispersed experiences and extensive riverbank restoration	Resource-based experiences and targeted restoration	Enhanced experiences and essential riverbank restoration	Diversified experiences and selective riverbank restoration
Infrastructure						
Wawona Hotel	104 rooms					
Wawona Campgrounds	99 sites	Reduced to 67 sites	Reduced to 72 sites	Reduced to 72 sites	Reduced to 86 sites	Reduced to 86 sites
Wawona stock camp	Located near river	Relocated to Wawona Stables	Relocated to Wawona Stables	Relocated to Wawona Stables	Relocated to Maintenance Yard	Relocated to Wawona Stables
Fencing and boardwalks	Used to denote closed areas and/or divert human foot traffic or parking away from sensitive areas.					
Policy and Regulation						
Lodging management	Concession operated, available by reservation					
Campground regulations	<ul style="list-style-type: none"><li>NPS operated by combination of reservation system first come-first served availability.</li><li>Length of stay limited to not more than a total of 7 days, and camping within all other portions of the park, during the same period, is limited to not more than a total of 14 days.</li><li>Maximum of 6 people per individual site and 30 people per group site.</li><li>Maximum of 2 vehicles per site.</li><li>Food storage regulations apply.</li></ul>					
Boating regulations	Allowed downstream of swinging bridge					
Fishing regulations	<ul style="list-style-type: none"><li>State regulations apply</li><li>No fishing from bridges, including Swinging Bridge</li></ul>					
Swimming regulations	<ul style="list-style-type: none"><li>No jumping or diving from bridges</li><li>No swimming within Wawona water intake or 100 yards upstream</li><li>No use of soaps, shampoos or detergents (biodegradable or otherwise) in any waters of the park.</li></ul>					

## Infrastructure

Under all alternatives, the Wawona Hotel, a National Historic Landmark, is retained at its current capacity of 104 rooms. The Wawona campground configuration varies across alternatives, depending on the number of sites removed from river or cultural resource areas. In Alternative 2 the campground is reduced to 67

sites, in Alternatives 3 and 4 to 72 sites, and in Alternatives 5 and 6 to 86 sites. Fencing and signs help delineate parking areas and paths, guiding use away from steep riverbanks or meadow and riparian areas.

### **Policy and Regulation**

As in the other river segments, overnight lodging at the Wawona Hotel would continue to be managed by the primary park concessioner, with rooms available by reservation. The Wawona campground would continue to be managed by the National Park Service with a mix of an advanced reservation and first-come-first-served system. All current camping, boating, fishing, and swimming regulations would continue, as summarized in the table above.

### **Conclusion**

The primary user capacity choices in the Wawona segment are related to the sites in the current Wawona campground that encroach on sensitive areas and cultural values. Sites have been pulled away from these areas reducing the overnight capacity in this segment to varying degrees.

## **Segment 8: South Fork Merced River Below Wawona**

### ***Management Goals and Considerations***

Management goals related to user capacity in this two-mile segment include: (1) protecting natural processes; and (2) promoting visitor enjoyment. The only identified outstandingly remarkable value is the rare plant Sierra sweet bay, which is more likely to be affected by the type or location of use than by amount of use.

The segment is also rarely visited, so describing potential recreation impacts, defining standards, and determining user capacities is largely conjectural. Nevertheless, some day users hike along the river to fish (leaving from the campground), but this use and its impact are minimal. Similarly, a few highly skilled whitewater boating groups (typically kayakers) may descend the Class V+ South Fork in the narrow range of boatable flows in early summer, but the primary focus of such trips is downstream of the park boundary. Similarly, a few users each year may hike into the corridor seeking places to fish or relax in near-complete solitude, but the reach is short, the terrain is steep and challenging, and there are no known trails. For boating and hiking, management goals focus on wilderness-like settings and very low density recreation opportunities.

### ***Indicators and Standards***

User capacities in this segment are based on encounters with other groups per day; a measure of solitude (similar to the trail-less areas in the South Fork above Wawona segment). Research suggests standards for low density wilderness experiences should be set at less than five encounters per day (Vaske et al, 1986), which has been chosen as the standard across all alternatives.

Based on research from other rivers, relationships between use and encounters in this segment are likely to be direct and linear. With encounter standards set at five per day, use levels of three or less groups per day are unlikely to violate this standard.

### ***Overview of Capacities***

The *Merced River Plan/DEIS* proposes a visitor capacity of three groups per day (with maximum group size of five). Based on NPS estimates, this level of use has rarely, if ever, been exceeded. Administrative use in this segment is also low, but the *Merced River Plan/DEIS* adds administrative use of one group (up to five people) per day for patrols or search and rescue. All capacities for visitor and administrative use are the same across alternatives, and they will protect or enhance visitor experiences by ensuring that encounters will not exceed standards in the corridor.

### ***Capacity Management***

Overnight use in this segment is prohibited (because it is within 4 miles of Wawona), so the backcountry permit system does not apply. Although boaters have not requested permission to run this reach in the past, they would be required to register under all new alternatives. Proposed capacities would be managed through self-registration at Wawona Campground or other access points.

The *Merced River Plan/DEIS* alternatives propose no changes to the undeveloped nature of the segment (no trails, bridges, or related development). As in other wilderness areas that overlap with the corridor, management actions work with capacities to protect and enhance river values. These are common across all alternatives, and include Leave-No-Trace regulations that encourage visitors to avoid building fires, carry out all trash, bury human waste, and use bear-resistant food canisters.

### ***Conclusion***

There are no user capacity tradeoffs in the segment below Wawona; all alternatives maintain the same encounter standards and existing low-use levels. This part of the corridor provides very low density, solitude-oriented recreation experiences and minimal visitor-related impacts, and no stakeholder or public input has advocated higher-use alternatives.

## 7. FACILITIES AND SERVICES ANALYSIS

The Wild and Scenic Rivers Act and the 1982 Guidelines provide direction on the types of facilities that are allowed in designated river corridors. In addition, the Ninth Circuit's 2008 opinion on the Revised MRP questioned whether the level of development in some parts of the river corridor was protective of ORVs. In keeping with this guidance and to address concerns raised by the court, Chapter 7 analyzes structures and facilities within each segment of the river corridor in terms of their effect on river values. This chapter also examines the feasibility of relocating, removing or redesigning facilities that cause management concerns with regard to ORVs. The information presented in this chapter informed the development of the alternatives presented in Chapter 8, including the actions that are common to Alternatives 2 - 6.

The definitions for wild, scenic and recreational river areas in Section 2 of the Act provide important guidance on the type and intensity of development that is allowable in designated river segments. The 1982 Guidelines expand upon these statutory definitions. In essence, the Act and the Guidelines describe the type and intensity of development that may exist in the river areas in terms of a continuum, with the least amount of development tolerated in wild segments. Recreational segments are defined as being readily accessible by road and may have roads paralleling the river on one or both banks as well as bridge crossings. Recreational segments may also have some residential, commercial or similar development, and may have evidence of impoundment or diversion. Scenic river segments have less discernable development. A scenic segment retains its overall natural character but may have structures or concentrations of structures in short reaches of the total area. Scenic segments may be accessible in places by roads. Wild segments are vestiges of primitive America showing little or no evidence of human development, although a few inconspicuous structures are permissible. They generally do not contain roads and are free of impoundment<sup>1</sup>.

The 1982 Guidelines also discuss facilities in terms of whether they are major or basic facilities. The Guidelines state that: "Major public use facilities such as developed campgrounds, major visitor centers and administrative headquarters will, where feasible, be located outside the river area. If such facilities are necessary to provide for public use and/or to protect the river resource, and location outside the river area is infeasible, such facilities may be located within the river area provided they do not have an adverse effect on the values for which the river area was designated." Other facilities, such as picnic areas, public restrooms, roadside pull-outs, shuttle bus stops, and campground kiosks, are considered "basic facilities" by the Guidelines. Basic facilities may be located in river areas as a way to absorb user impacts as long as river values are protected. Finally, the Guidelines also make allowance for structures related to resource management, such as trail bridges, fences and other minor structures. These types of minor structures are allowed if they are compatible with the segment's classification and the structures harmonize with the surrounding environment<sup>2</sup>.

In addition to the direction provided in the Act and Guidelines, the Ninth Circuit's 2008 opinion expressed concern that certain existing development within the Merced river corridor was degrading ORVs. The Court explained that the NPS could not presume that facility levels in existence in 1987 were protective of ORVs or that pre-existing facility levels complied with the Act's requirement to address user capacity<sup>3</sup>.

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<sup>1</sup> 47 *Federal Register* 173: 39457 and 39458, Sept. 7, 1982.

<sup>2</sup> 47 *Federal Register* 173: 39459, Sept. 7, 1982.

<sup>3</sup> *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1035-36 (9<sup>th</sup> Cir 2008)

The Merced River corridor within Yosemite National Park and the El Portal Administrative Site, contains many types of structures used for administrative needs, visitor lodging, employee housing, food and retail services, campgrounds, roads, bridges, and utility infrastructure. This chapter evaluates these types of structures and facilities in order to assess whether they may be retained or whether they should be relocated, removed or redesigned. This analysis is presented in Table 7-1.

Facilities meeting the definition of a basic facility under the Guidelines are not reflected in Table 7-1. There are many basic facilities located in the 81 mile river corridor. It is not practical to reflect each such facility in Table 7-1. Basic facilities are addressed in Chapter 8, which discusses the overall effect of the entire array of structures and facilities envisioned under each alternative on river values.

## RELATIONSHIP OF THIS ANALYSIS WITH OTHER CHAPTERS

### *Chapter 5: River Values and Their Management*

Where it has been determined that development footprints, visitor use and / or administrative use are causing local effects to river values as defined in “River Values and Their Management” (Chapter 5), this plan calls for removal, re-design, and/or relocation of those facilities. All determinations of local effects on river values—defined as free-flowing condition, water quality, and outstandingly remarkable values—are congruent with the information gathered to determine baseline conditions of river values and the management considerations presented in Chapter 5. However, not all public-use facilities and services that are removed or relocated across the range of alternatives, as presented in “Alternatives” (Chapter 8), have been determined to be causing local effects to river values. Some facilities or services are proposed for removal or relocation based on the thematic concept of each alternative.

### *Chapter 8: Alternatives*

Chapter 8 presents a determination as to whether facilities and services are necessary for public use or protection of the river resource as directly correlated to the visitor experience and land-use planning goals for each alternative. New or re-developed facilities across the range of alternatives have been determined to either be necessary or not necessary. Those that are necessary – screened for whether it is feasible to relocate the facility or service outside the river corridor. A summary of all current and potential facilities and services are presented below in Table 7-1.

Extensive studies and site analyses have been conducted at the primary visitor-service areas (Merced Lake; Curry Village and Campgrounds; Yosemite Village and Housekeeping Camp (including the Yosemite Village Day Use Parking Area); Yosemite Lodge and Camp 4 Area; West Yosemite Valley; El Portal; and Wawona. These analyses identify major site constraints that restrict redevelopment and/or relocation of facilities. Such constraints include the locations of floodplains; wetlands; meadows; riparian habitat; rare plants; archeological sites; and historic structures. Studies and site analyses, together with river segment classifications, informed the alternatives under consideration—particularly in terms of sensitive areas that must be protected and of resilient areas where facilities and services could be located.



**TABLE 7-1: ANALYSIS OF LOCAL EFFECTS ON RIVER VALUES**

NPS subject-matter specialists representing a broad spectrum of professional disciplines considered Geographic Information Systems (GIS) data and the results of scientific research to evaluate each facility for its potential to cause local effects to river values.

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
<b>Segment 1: Wild Classification</b> <b>All facilities noted below are consistent through their trail-only access with the wild classification</b>			
Merced Lake High Sierra Camp	Recreation; Scenic	Merced Lake High Sierra Camp affects the wilderness experience integral to the Recreation ORV in this segment and is a visual impact on the Scenery ORV.	Options explored in the alternatives include repurposing the area to dispersed camping and removing lodging infrastructure; removing and restoring to natural conditions, converting to designated wilderness; converting to a temporary pack camp and removing permanent infrastructure; reducing capacity; or replacing white canvas tents with natural colored fabric to blend with surroundings.
Merced Lake Backpackers Camping Area	Recreation	High levels of use at the Merced Lake Backpackers Camping Area affect the wilderness experience integral to the Recreation ORV in this segment.	Convert to dispersed camping
Little Yosemite Valley Camping Area	Recreation	Crowding at Little Yosemite Valley Camping Area impacts the wilderness experience integral to the Recreation ORV in this segment.	Options explored in the alternatives include converting the area to dispersed camping and reducing capacity.
Moraine Dome Camping Area	Recreation	Crowding and infrastructure at Moraine Dome Camping Area impacts the wilderness experience integral to the Recreation ORV.	Convert to dispersed camping and remove infrastructure
<b>Segment 2: Recreational Classification</b> <b>All facilities noted below are consistent through their level of development accessible by road</b>			
<b>Curry Village and Campgrounds</b>			
Upper Pines Campground	Biological	Some campsites are located within 150 feet of the river in sensitive riparian habitat.	Remove campsites within floodplain and restore to natural conditions
Upper Pines Campground	Cultural	Some campsites located near sensitive cultural resource	Relocate campsites to avoid sensitive resource
Lower Pines Campground	Biological	Some campsites are located within 150 feet of the river in sensitive riparian habitat.	Options explored in the alternatives include removing campsites located within 100 ft of river, removing campsites located within 150 ft of river, removing campsites located within the 100 year floodplain, restoring riparian habitat and installing protective fencing to facilitate restoration
North Pines Campground	Biological	Some campsites are located within 150 feet of the river in sensitive riparian habitat.	Options explored in the alternatives include removing campsites located within 100 year floodplain, removing campsites located within 150 ft of the river, removing campsites from within 100 ft of river, restoring riparian habitat, and designating formal river access
Backpackers Campground	Biological	Some campsites are located within 150 feet of the river in sensitive riparian habitat.	Options explored in the alternatives include relocating campsites outside of floodplain, relocating campsites outside of riparian buffer zone, restoring riparian habitat, and designating formal river access
Valley Campground Reservation Center	None	None	No required actions or mitigation measures

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
<b>Segment 2: Recreational Classification (continued)</b> All facilities noted below are consistent through their level of development accessible by road			
<b>Curry Village and Campgrounds (continued)</b>			
Housekeeping Camp Lodging Units	Biological	Some units are located within 150 feet of the river in sensitive riparian habitat.	Options explored in the alternatives include removing all lodging units and restoring 100 year floodplain to natural conditions, removing lodging units located within ordinary high water mark of river, and restoring riparian habitat
Housekeeping Camp Laundry	None	None	No required actions or mitigation measures
Housekeeping Camp Shower Houses and Restrooms	None	None	No required actions or mitigation measures
Housekeeping Camp Grocery Store	None	None	No required actions or mitigation measures
Curry Village Lodging and Shower Houses	None	None	No required actions or mitigation measures
Curry Village Pavilion and Food Service	None	None	No required actions or mitigation measures
Camp Curry Overnight Parking	None	None	No required actions or mitigation measures
Curry Village Orchard Parking	None	None	No required actions or mitigation measures
Curry Village Grocery Store	None	None	No required actions or mitigation measures
Curry Village Pizza Deck and Bar	None	None	No required actions or mitigation measures
Curry Village Raft Rental	None	None	No required actions or mitigation measures
Curry Village Ice Rink	None	None	No required actions or mitigation measures
Curry Village Stables	None	None	No required actions or mitigation measures
Commercial Horseback Day Rides in Yosemite Valley	None	None	No required actions or mitigation measures
Curry Village Bike Rental	None	None	No required actions or mitigation measures
The Ahwahnee Rooms and Cottages	None	None	No required actions or mitigation measures
The Ahwahnee Bar and Food Service	None	None	No required actions or mitigation measures
The Ahwahnee Dining Room	None	None	No required actions or mitigation measures
The Ahwahnee Gift Shop	None	None	No required actions or mitigation measures
The Ahwahnee Sweet Shop	None	None	No required actions or mitigation measures
The Ahwahnee Swimming Pool	None	None	No required actions or mitigation measures
The Ahwahnee Tennis Court	Cultural	Tennis courts are located in a sensitive cultural area	Remove tennis courts
The Ahwahnee Parking Lot	Cultural	Parking at the Ahwahnee, a National Historic Landmark, and a contributing element to the Yosemite Valley Historic Resources ORV, is inadequate to meet day and overnight use	Redesign and formalize the existing parking lot following the Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
<b>Segment 2: Recreational Classification (continued)</b> All facilities noted below are consistent through their level of development accessible by road			
<b>Curry Village and Campgrounds (continued)</b>			
Boys Town Employee Housing Area	None	None	There are no local effects from this facility in its current location on river values, therefore no actions or mitigation measures are necessary
Huff House Employee Housing Area	None	None	
Curry Village Stables Employee Housing Area	None	None	
Ahwahnee Employee Dormitory	None	None	
Curry Village Employee Residence Area	None	None	
Happy Isles Nature Center	None	None	No required actions or mitigation measures
Happy Isles Snack Stand	None	None	No required actions or mitigation measures
Le Conte Memorial Lodge (National Historic Landmark)	Cultural	LeConte Memorial Lodge, a National Historic Landmark, and a contributing element to the Yosemite Valley Historic Resources ORV is in "fair" condition and in need of restoration	Develop a Historic Structure Report and address recommendations for treatment to bring the Lodge to "good" condition
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Biological Cultural	This road bisects a meadow which affects meadow health. This road also bisects culturally sensitive areas.	Options explored in the alternatives include removing 900' of Northside Drive, removing roadside parking to prevent further meadow encroachment and informal trailing, filling ditches, removing informal trails, adding boardwalks, installing culverts to improve hydrologic connectivity, and conducting studies to determine feasibility of removing Northside Drive from the meadow
Southside Drive (through Stoneman Meadow)	Biological	This road bisects a meadow which affects meadow health.	Options explored in the alternatives include removing 1,335 feet of Southside Drive through Stoneman Meadow to enhance connectivity of meadow and floodplain, and removing roadside parking to prevent further meadow encroachment and informal trailing
Happy Isles Loop Road	None	None	No required actions or mitigation measures
Sugar Pine Bridge	Free-Flowing Condition	The historic Sugar Pine Bridge is constricting the free-flowing condition of the Merced River and causing localized impacts to hydrologic function.	Options explored in the alternatives include removing the bridge and restoring the area to natural conditions, retaining the bridge while improving riverbank condition and increasing channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, use of riverbank bioengineering techniques, and restoring riparian habitat
Ahwahnee Bridge	Free-Flowing Condition	The historic Ahwahnee Bridge is constricting the free-flowing condition of the Merced River and causing localized impacts to hydrologic function.	Options explored in the alternatives include removing the bridge and restoring the area to natural conditions, retaining the bridge while improving riverbank condition and increasing channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, use of riverbank bioengineering techniques, and restoring riparian habitat
Stoneman Bridge	Free-Flowing Condition	The historic Stoneman Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Options explored in the alternatives include removing the bridge and restoring the area to natural conditions, retaining the bridge while improving riverbank condition and increasing channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, use of riverbank bioengineering techniques, and restoring riparian habitat

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
<b>Segment 2: Recreational Classification (continued)</b> All facilities noted below are consistent through their level of development accessible by road			
<b>Curry Village and Campgrounds (continued)</b>			
Clark's Bridge	Free-Flowing Condition Geologic/Hydrologic	Clark's Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Options explored in the alternatives include removing the bridge and restoring the area to natural conditions, retaining the bridge while improving riverbank condition and increasing channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, use of riverbank bioengineering techniques, and restoring riparian habitat
Happy Isles Road Bridge	Free-Flowing Condition Geologic/Hydrologic	The bridge at Happy Isles is impacting the free-flowing condition of the Merced River by constricting flow within the bed and banks.	Options explored in the alternatives include removing the bridge and restoring the area to natural conditions, retaining the bridge while improving riverbank condition and increasing channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, use of riverbank bioengineering techniques, and restoring riparian habitat
Upper River Campground (New)	None	None	No required actions or mitigation measures
Lower River Campground (NEW)	None	None	No required actions or mitigation measures
West of Backpackers Campground (New)	None	None	No required actions or mitigation measures
Concessioner Stables repurposed as camping(New)	None	None	No required actions or mitigation measures
Upper Pines Walk-in Campground (New)	None	None	No required actions or mitigation measures
<b>Yosemite Village and Housekeeping Camp</b>			
Housekeeping Camp Bridge	Free-flowing Condition Geologic/Hydrologic	The footbridge at Housekeeping Camp is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Retain Bridge: Improve riverbank condition and increase channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and use of riverbank bioengineering techniques and restore riparian habitat
Concessioner General Office	None	None	No required actions or mitigation measures
Ahwahnee Row Employee Housing	Biological	Ahwahnee Row housing sits on former meadow and truncates the current western extend of Ahwahnee Meadow	Options explored in the alternatives include removing housing and restoring to natural conditions, retaining housing while establish a 50 ft buffer from Indian Creek, and restoring riparian vegetation.
Lower Tecoya Employee Housing Area	None	None	No required actions or mitigation measures
Lost Arrow Employee Housing Area	None	None	No required actions or mitigation measures
Concessioner Garage	None	None	No required actions or mitigation measures
Fire Station	None	None	No required actions or mitigation measures
Village Store	None	None	No required actions or mitigation measures
Village Grill	None	None	No required actions or mitigation measures
Village Sports Shop	None	None	No required actions or mitigation measures

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
<b>Segment 2: Recreational Classification (continued)</b> All facilities noted below are consistent through their level of development accessible by road			
<b>Yosemite Village and Housekeeping Camp (continued)</b>			
Village Store Parking Lot	None	None	No required actions or mitigation measures
Art Activity Center/ Bank Building	None	None	No required actions or mitigation measures
Superintendent's House (Residence 1)	Cultural	Residence 1, a contributing element of the Yosemite Valley Historic Resources ORV is in "poor condition" and subject to flooding	Relocate and rehabilitate the building per the Secretary of the Interior's Standards (1995) for the Treatment of Historic Properties and the Historic Structure Report (2012)
Yosemite Valley Chapel	None	None	No required actions or mitigation measures
Sentinel Crossover	Biological	This road bisects a meadow which affects meadow health.	Retain Bridge: Improve riverbank condition and increase channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and use of riverbank bioengineering techniques. Restore riparian habitat, and remove roadside parking to prevent further meadow encroachment and informal trailing
Intersection of Northside Drive and Sentinel Drive Roundabout (New)	Biological	Potential impacts to Palustrine Forested Wetland	There are opportunities to compensate wetlands through meadow and riparian restoration actions.
Yosemite Village Day-use Parking Area Pedestrian Underpass (New)	Biological	Potential impacts to Palustrine Emergent Wetland	There are opportunities to compensate wetlands through meadow and riparian restoration actions.
Yosemite Village Day-use Parking Area	None	None	No required actions or mitigation measures
Intersection of Northside Drive and Sentinel Drive Roundabout (New)	Biological	Potential impacts to Palustrine Emergent Wetland	There are opportunities to compensate wetlands through meadow and riparian restoration actions.
<b>Yosemite Lodge and Camp 4</b>			
Camp 4 Campground	None	None	No required actions or mitigation measures
Yosemite Lodge Overnight Parking	None	None	No required actions or mitigation measures
Yosemite Lodge Garden Terrace and Cliff Room	None	None	No required actions or mitigation measures
Yosemite Lodge Swimming Pool and Snack Stand	None	None	No required actions or mitigation measures
Yosemite Lodge Nature Shop	None	None	No required actions or mitigation measures
Yosemite Lodge Housekeeping and Maintenance Building	None	None	No required actions or mitigation measures
Yosemite Lodge Gift and Grocery / Convenience Shop	None	None	No required actions or mitigation measures
Yosemite Lodge Mountain Room Bar and Food Service	None	None	No required actions or mitigation measures
Yosemite Lodge Mountain Room Restaurant	None	None	No required actions or mitigation measures

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
<b>Segment 2: Recreational Classification (continued)</b> All facilities noted below are consistent through their level of development accessible by road			
<b>Yosemite Lodge and Camp 4 (continued)</b>			
Yosemite Lodge Food Court	None	None	No required actions or mitigation measures
Yosemite Lodge Post Office	None	None	No required actions or mitigation measures
Yosemite Lodge Bike Stand	None	None	No required actions or mitigation measures
Yosemite Lodge Highland Court Employee Housing	None	None	No required actions or mitigation measures
Yosemite Lodge Employee Housing (Thousands Cabins)	None	None	No required actions or mitigation measures
NPS Volunteer Office	None	None	No longer use, would be removed
Swinging Bridge	Free Flowing Condition	The Swinging Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Retain Bridge: Improve riverbank condition and increase channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and use of riverbank bioengineering techniques and restore riparian habitat
Superintendent's Footbridge	Free Flowing Condition	The Superintendent's Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Retain Bridge: Improve riverbank condition and increase channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and use of riverbank bioengineering techniques and restore riparian habitat
Yosemite Lodge Parking Area (New)	None	None	No required actions or mitigation measures
East of Camp 4 Campground (New)	None	None	No required actions or mitigation measures
West of Lodge Campground (New)	None	None	No required actions or mitigation measures
Pedestrian underpass at Yosemite Lodge	Cultural	Construction of underpass may disturb sensitive archeological resources	Mitigation will be developed in consultation with tribes, the State Historic Preservation Office (SHPO) and detailed in a Plan specific programmatic agreement
Yosemite Lodge Housing (New)	None	None	No required actions or mitigation measures
<b>West Yosemite Valley</b>			
Eagle Creek Campground (New)	None	None	No required actions or mitigation measures
El Capitan Crossover	None	None	No required actions or mitigation measures

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
El Capitan Crossover Bridge	Free-flowing Condition	The El Capitan Cross-over Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Retain Bridge: Improve riverbank condition and increase channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and use of riverbank bioengineering techniques and restore riparian habitat
<b>Segment 2: Recreational Classification (continued)</b> <b>All facilities noted below are consistent through their level of development accessible by road</b>			
<b>West Yosemite Valley (continued)</b>			
Pohono Bridge	Free-flowing Condition	The Pohono Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Retain Bridge: Improve riverbank condition and increase channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and use of riverbank bioengineering techniques and restore riparian habitat
West Valley Overflow Parking Area (New)	None	None	No required actions or mitigation measures
<b>Segment 3: Scenic Classification</b> <b>All facilities noted below are consistent through their modest size and scale with the scenic classification</b>			
Arch Rock Entrance Station Kiosk	None	None	No required actions or mitigation measures
Arch Rock Housing (2 duplexes)	None	None	No required actions or mitigation measures
Arch Rock VUA Office	None	None	No required actions or mitigation measures
<b>Segment 4: Recreational Classification</b> <b>All facilities noted below are consistent through their level of development accessible by road</b>			
El Portal Administrative Complex	None	None	No required actions or mitigation measures
Rancheria Employee Housing Area	None	None	No required actions or mitigation measures
Old El Portal Employee Housing Area	None	None	No required actions or mitigation measures
El Portal Market and Gas Station Complex	None	None	No required actions or mitigation measures
Murchison House	None	None	No required actions or mitigation measures
Rancheria Employee Housing (New)	Cultural	None	Avoidance of resources will be ensured through standard mitigation measures including pre-construction consultation and monitoring during construction
Old El Portal Employee Housing (New)	None	None	No required actions or mitigation measures
Abbieville / Trailer Village Employee Housing (New)	Cultural	Located within a sensitive cultural resource area	Avoidance of resources will be ensured through standard mitigation measures including pre-construction consultation and monitoring during construction
El Portal Remote Parking Area at Abbieville / Trailer Village (New)	Cultural	Located within a sensitive cultural resource area	Avoidance of resources will be ensured through standard mitigation measures including pre-construction consultation and monitoring during construction
Abbieville / Trailer Village Administrative Group Campground (New)	Cultural	Located within a sensitive cultural resource area	Avoidance of resources will be ensured through standard mitigation measures including pre-construction consultation and monitoring during construction
El Portal Post Office	None	None	No required actions or mitigation measures
El Portal Elementary School / High school	None	None	No required actions or mitigation measures

Facility or Service	River Value Affected by Facility or Service?	Local Effect on River Values?	Mitigation Required or Action Proposed to Address Local Effects
NPS Offices in Old El Portal	None	None	No required actions or mitigation measures
NatureBridge Office / Employee Housing Building	None	None	No required actions or mitigation measures
<b>Segment 4: Recreational Classification (continued)</b> <b>All facilities noted below are consistent through their level of development accessible by road</b>			
Carroll Clark Community Hall	None	None	No required actions or mitigation measures
Mariposa County Pool	None	None	No required actions or mitigation measures
El Portal Fire Station	None	None	No required actions or mitigation measures
Motor Inn Cabins	None	None	No required actions or mitigation measures
AT&T Building	None	None	No required actions or mitigation measures
Odger's Fuel Storage Facility	None	None	Located within the 100-year Floodplain and would be removed across all alternatives
Old Wastewater Treatment Plant	Cultural	Located within a sensitive cultural resource area	Consult with culturally associated American Indian tribes to determine appropriate method for removing abandoned infrastructure
<b>Segments 5 (Wild), 6 and 7 (Recreational), and 8 (Wild) Classifications</b> <b>All facilities noted below are consistent through their level of development accessible by road</b>			
Wawona Campground	Biological Cultural	The proximity of camp sites to the river causes trampling and riverbank erosion that inhibits riparian vegetation growth. Sensitive archeological sites are located within campground area.	Options considered in the alternatives include reducing capacity at the campground, removing campsites located within the 100 year floodplain, removing or relocating campsites to avoid sensitive cultural resources, removing campsites located within 150 ft of river, and removing campsites within 100 ft of the river
Wawona Hotel Lodging Units	Cultural	The Wawona Hotel National Historic Landmark is in "good" condition, while some contributing elements of the building are in "fair" condition	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at the Main Hotel, Manager's Cottage, Clark Cottage and Annex building to bring the buildings to "good" condition
Wawona Hotel: Clark Cottage	Cultural	The Clark Cottage is currently in "fair" condition	
Wawona Hotel Restaurant	None	None	
Wawona Hotel Tennis Court	None	None	
Wawona Hotel Golf Course & Shop	None	None	
Wawona Hotel Swimming Pool	None	None	No required actions or mitigation measures
Wawona Maintenance Yard Complex	None	None	No required actions or mitigation measures
Wawona Wastewater Treatment Plant	None	None	No required actions or mitigation measures
Wawona Gas Station	None	None	No required actions or mitigation measures
Wawona Store	None	None	No required actions or mitigation measures
Wawona Stables	None	None	No required actions or mitigation measures
Wawona Commercial Horseback Day Rides	None	None	No required actions or mitigation measures
Pioneer History Center	None	None	No required actions or mitigation measures
Wawona Store Parking Lot	None	None	No required actions or mitigation measures



## 8. ALTERNATIVES

### INTRODUCTION

This chapter presents the six alternatives proposed in the *Merced River Plan/Draft Environmental Impact Statement (DEIS)*. These alternatives represent a range of reasonable alternatives as required by the National Environmental Policy Act (NEPA) including a “No Action” Alternative (Alternative 1), in accordance with Council on Environmental Quality regulations (40 CFR 1502.14). The No Action Alternative represents a continuation of current management practices and provides a basis to compare differences among the alternatives. This chapter addresses the following topics:

- The process used to develop the alternatives and identify the preferred alternative for the *Merced River Plan/DEIS* (Figure 8-1)
- A description of each alternative (page 8-10)
- Identification of the Environmentally Preferred Alternative (page 8-317)
- Alternatives and actions considered and eliminated from further study (page 8-319)
- A Summary of Capacities (Table 8-56)
- A Summary of Alternatives and Actions (Table 8-58)
- River Value Analysis (page 8-331)

### The Process used to Develop the Alternatives

#### *The Merced River Planning Framework*

The National Environmental Policy Act (NEPA) requires federal agencies to rigorously explore a range of reasonable alternatives when planning for a major federal action. NEPA also mandates an early and open process to determine the scope of issues surrounding the proposed action, to develop options for addressing those issues, and to provide for public review and comment on the environmental analyses presented in the project’s draft environmental impact statement (Draft EIS).

Using a full complement of park personnel, including experts in park operations, facilities, and cultural and natural resources, the Merced River planning team devoted several years of effort, from 2009 to 2012, to develop five action alternatives for managing the river corridor (See Figure 8-1). In building the alternatives, the team worked within a planning framework that included eight major steps, which are explained below. Although this framework is described as a series of sequential activities, planning is fundamentally iterative. At each step, new information is uncovered and new insight is gained that can trigger changes to prior decisions. Additionally, extensive internal review and public input affected the process, occasioning still more revisions to it. In the case of the Merced, some of these steps were revisited almost yearly. Although time-consuming, this process of review and revision ultimately lead to a stronger end product, both in form and content.

The NPS has identified its preferred alternative, but all alternatives protect and enhance river values while providing for kinds and amounts of visitor use that are protective of river values. Collectively, the alternatives represent a wide range of choices for the future management of the Merced River corridor. The following sections provide greater detail with regard to each step in the planning process.

Figure 8-1: Creating Alternatives for Merced River Plan



### *Step 1. Define River Values to be Protected and Enhanced*

The Wild and Scenic Rivers Act (WSRA) mandates that each wild and scenic river "... shall be administered in such manner as to protect and enhance the values which caused it to be included in said system" (WSRA, Section 10 (a)). The values to be protected include the river's free-flowing condition, water quality, and those values that are "outstandingly remarkable." The Interagency Wild and Scenic Rivers Coordinating Council (Interagency Council) criteria for outstandingly remarkable values (ORVs) state that the value must be river-related and rare, unique, or exemplary in a regional or national context.

The National Park Service (NPS) began the process of identifying the ORVs for the Merced River in 1996. After completing other steps in the alternative development process (below), park planners re-visited the ORVs several times (in 2000, 2005, and 2009). Each time, park planners revised and updated the list, with further definitional clarification from the Interagency Council.

The planning team conducted internal ORV workshops, drawing upon scientific information, subject-matter expertise, peer review, government partners, management input, and expert guidance from other wild and scenic river professionals. Public scoping comments regarding ORVs were integrated into the *Draft 2010 Outstandingly Remarkable Values Report* for the Merced Wild and Scenic River, which represented the culmination of this work.

## ***Step 2. Assess Baseline Condition of River Values***

After the release of the 2010 report, workshops were held to solicit additional information on ORV locations and important features; to acquire more knowledge and information about specific ORVs or their components; and to gather suggestions about how river values could best be protected. A revised ORV report was posted to the Yosemite National Park's website in May 2011. Additional opportunities to comment on the ORVs were provided through the release of the fall 2011 and spring 2012 planning workbooks. Public comment and agency and tribal consultation resulted in yet another round of refinement and revision to the Merced River ORVs. Information used to evaluate the baseline condition of the Merced River ORVs included historic photos, maps, and archival materials; research studies and models of natural systems developed specifically for this planning effort; and the professional judgment of experienced subject-matter specialists. External peer reviews of specific research findings and the implications for overall river conditions were solicited.

The park planning team consolidated all of this information into the *Merced Wild and Scenic River Values Draft Baseline Conditions Report*. The assessment was also incorporated into "River Values and Their Management" (Chapter 5) of the *Merced River Plan/Draft EIS*. The report provides an assessment of river values at the time of the river's designation (1987) and represents the existing (or "baseline") condition of those values. This important step in the planning process provides a basis for comparison with the expected outcome of the actions described in the alternatives. It was also essential for identifying areas where actions must be taken to improve conditions in the river corridor.

The first draft of the baseline conditions assessment report, completed in 2011, informed park planners' understanding of river value conditions early in the planning process, guiding the structure and content of the alternatives in response to the identified management considerations.

In an effort to educate the public, the NPS facilitated a series of spring 2011 workshops and associated webinars. The workshops provided an opportunity to learn more about the conditions of the Merced River and the management considerations that needed to be addressed in the Merced River Plan. The *Merced Wild and Scenic River Values Draft Baseline Conditions Report* was subsequently posted on the park's website at [http://www.nps.gov/yose/parkmgmt/mrp\\_documents.htm](http://www.nps.gov/yose/parkmgmt/mrp_documents.htm), and public review and comment was encouraged. All public comments received during this phase of the planning process were posted online in May 2011.

## ***Step 3: Define Desired Condition, Adverse Effect, and Degradation for River Values***

In concert with assessing river values, NPS park managers determined the desired condition for those values, based on guiding legislation, available research and monitoring information, best professional judgment of subject-matter experts, and current trends in the relevant academic and public land management fields. Further, a comprehensive river management plan must contain provisions designed to prevent any adverse effect or degradation from occurring to the river values. Specific thresholds must be stated for mandatory management action that will occur ahead of any such impacts or degradation, to keep the state of river values at or above the desired condition (see "River Values and Their Management" Chapter 5).

Park managers developed indicators of river-value condition that are sensitive to change, along with the monitoring protocols needed to standardize data collection over time. By following these protocols, park managers will have early indications of changing conditions and be able to correct downward trends before they broach management standards. In some cases, a river value may not lend itself easily to monitoring,

such as stairstep river morphology, which is affected only by massive geologic forces that are well beyond human control. Consequently, park managers did not define these terms for that river value. Indicators were developed for all other river values.

#### ***Step 4: Identify Management Concerns and Potential Corrective Actions***

This step involves applying the definitions of river condition (Step 3's management standard, adverse effect, and degradation) to the existing river value conditions (identified in Step 2). By comparing the actual river condition to the management standard, park managers obtained a clear picture of which values needed remedial action to bring them up to the management standard or forestall a downward trend in conditions. In addition, due to the comprehensive and systematic nature of this review, a host of localized areas of concern were identified as places where action could be taken to enhance river values.

The planning team separated this step of the process into two stages, primary and secondary scope. The first stage or primary scope, involved a systematic review of the river corridor to identify management considerations related to the free-flowing condition of the river, water quality, hydrologic/geologic, recreational, cultural, biological, and scenic ORVs. The team used scientific and geospatial data, such as floodplain maps, remote sensing imagery, rock-fall hazard zone models and maps, and channel migration history to support this review. All public comments received during scoping were screened to ensure that location-specific concerns were identified and paired with corrective measures. Finally, subject-matter specialists used their knowledge of the river system to supplement and clarify the findings of the baseline conditions report.

The team ranked the primary scope issues using the following factors:

- Degree of impact from existing infrastructure or current uses on the free-flowing condition of the river (primarily impacts to river flows below the ordinary high-water mark, approximated by the 2- to 10-year floodplain)
- Degree of impact from existing infrastructure or current uses on specific ORVs (biological, scenic, cultural, geological/hydrological)
- Specific locations where potential threats to water quality need to be addressed (point source pollutants, such as nutrients, or petro-chemicals, for example)
- Degree of impact from existing infrastructure or current uses on the Recreation ORV (conflicts between types and locations of activities, density and crowding at key use areas)

The primary scope evaluation was completed first to ensure all alternatives would include protective measures to remedy problems identified with natural and cultural ORVs. The ecological restoration program (detailed in Appendix E) forms the centerpiece of restoration actions in the *Merced River Plan/DEIS*, though there are others (such as removing some structures from riparian areas). Actions must also correct past impacts to the extent possible (earlier impacts can be irreversible—some effects of historic manipulation of the river corridor, such as blasting of the El Capitan Moraine, may never be reversed, for example). By identifying all known areas of concern and options for corrective actions, managers ensured all alternatives would protect and enhance river values. These actions form the core of all action alternatives.

The next stage, or secondary scope evaluation, pertained to issues related to visitor use, including congestion, transportation and visitor experience. Transportation modeling identified the limitations associated with the existing road system design and options for improving traffic flow. Various mixes of

parking, overnight accommodations, camping, and services were packaged to provide for significantly different visitor experiences within the range of alternatives.

A summary of the primary and secondary scope issues, along with potential solutions, was developed and packaged as the *Merced Wild and Scenic River Planning Workbook* (fall 2011). The NPS conducted five workshops in conjunction with the release of the workbook to gather input on the range of potential options developed to protect and enhance river values. Comments on this workbook were posted on Yosemite’s website.

### ***Step 5: Determine Location and Size of Necessary Facilities***

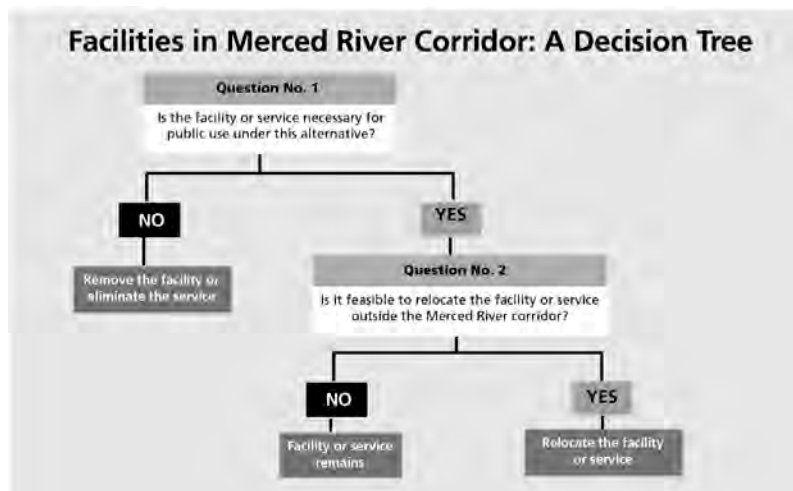
WSRA and the 1982 National Wild and Scenic River System; Final Revised Guidelines for Eligibility, Classification and Management of River Areas provide direction on the types of facilities that are allowed in designated river corridors. In addition, the 2008 opinion of the U.S. Court of Appeals for the Ninth Circuit on the 2005 Revised MRP questioned whether the level of development in some parts of the river corridor was protective of ORVs. The planning team, therefore, evaluated existing facilities and services within the river corridor to determine whether they should be retained, removed or relocated in order to protect and enhance river values.

“River Values and Their Management” (Chapter 5) identifies locations where the development footprint, visitor uses and /or administrative uses were found to be causing local effects to components of river values.

“Facilities and Services Analysis” (Chapter 7) presents the results of the planning team’s analysis of all existing public-use facilities and services to determine whether they are currently impacting any river values and, if so, how those impacts could be eliminated. In particular, the plan calls for removal, redesign, and/or relocation of those facilities. New development (and re-development) proposed across the range of alternatives was also screened using the above criteria.

It is important to note that, across the range of alternatives, changes to facilities and services are made for reasons other than impacts to river values (as shown in Figure 8-2). Some facilities and services are modified to further the thematic goals of the individual alternatives. “Alternatives” (Chapter 8) includes a determination of the location, size and type of facilities and services necessary for public use, as directly correlated to the visitor experience and land-use planning goals for each alternative.

**Figure 8-2: Facilities in the Merced River Corridor: A Decision Tree**



### ***Step 6: Solicit Public Input on Organizing Themes for Alternatives***

Even before beginning the alternatives development process, park managers solicited public input for the plan. While public input is addressed in some of the foregoing steps, it is reported as a separate step because it is foundational to the alternatives development process. Public input was solicited on a regular basis throughout the project, from the earliest public scoping period in 1999 through the review and revision of this *Merced River Plan/DEIS* over the next several months. Major topics discussed included the ORVs, their conditions, and indicators to assess those conditions; user capacity; other planning issues the alternatives needed to address; organizing concepts or themes for the alternatives, site plan concepts, and the preliminary alternatives themselves.

The *Merced River Plan/DEIS* has been developed through consultation with culturally associated American Indian tribes, the State Historic Preservation Officer, and other federal and state agencies. Gateway communities, organizations, and interested members of the public have provided nearly 1,500 public correspondences (including letters, faxes, emails, comment forms, and public meeting flip-chart notes). The NPS has conducted more than 40 public meetings, presentations, workshops, field visits, and open houses in support of the EIS process. Two planning workbooks were prepared and distributed for public review and comment (fall 2011 and spring 2012) prior to completion of the *Merced River Plan/DEIS*.

### ***Step 7: Evaluate Operational and Implementation Feasibility of Draft Alternatives***

Once draft action alternatives were completed, park planners put them through several rounds of review and critique by park managers, field staff, resource experts, and the public. Planners examined all site proposals and management actions, ensuring that no unresolvable operational or logistical conflicts remained within individual alternatives. Cost estimates were developed for the alternatives, subjecting those estimates to scrutiny as well.

### ***Step 8: Establish User Capacities Consistent with Protection of River Values***

WSRA and Secretaries' Guidelines direct managing agencies to address user capacity in river management plans and to establish "the kinds and amounts of public use which the river area can sustain without impact to the values for which it was designated." As with the other steps above, public input was a fundamental part of this step. During the scoping period for the Merced River Plan, the NPS asked the public to describe what activities they enjoy in the Merced River corridor, to help define the Recreational ORV and begin to address the issue of kinds and amounts of use the river can sustain. User-capacity experts developed a nine-step process to address user-capacity mandates (see "Visitor Use and User Capacity" Chapter 6). These steps were integrated into the overall planning process. User capacities were adjusted to reflect the experiences envisioned within each alternative. Planners produced a range of user capacities and recreation types, all within the existing constraints and all protective of river values.

As a part of the supporting research, the planning team compiled visitor-use data (Littlejohn et al. 2005; Le et al. 2008) that provided insight into the types of activities and experiences visitors preferred. The team also compiled information on the historic, current, and projected levels of visitor use along the Merced River (DEA 2007; NPS 2008d; NPS 2008e; NPS 2009c; and NPS 2009e) and conducted scientific studies to determine the extent to which visitor use affects river values. Additionally, comprehensive mapping and spatial data related to river values were gathered and compiled to represent planning constraints. Collectively, research studies,

constraint maps, and best professional judgment informed decisions on the kinds and amounts of visitor and other public use that may be accommodated without adverse effects to river values.

## Implementation Plan

Not all of the actions in the alternatives will be described with enough detail to be considered implementable upon signing of the Record of Decision (ROD). Some actions will require follow-on NEPA compliance and further environmental analysis, in the form of Categorical Exclusions (CE), Environmental Assessments (EA) or Environmental Impact Statements (EIS). The details of the implementation plan and phasing will be outlined in the ROD.

Actions fall under three different categories in this plan; actions that are required to protect and enhance river values and actions that are required to address user capacity elements. The three categories are described below.

1. **Management Concerns:** A *Management Concern* describes a river value that is not presently in a protected state (Chapter 5); requiring immediate corrective actions. Corrective actions are a high priority for the NPS, as the managing agency of the Merced River Wild and Scenic River. These corrective actions will be implemented upon signing of the ROD or follow-on NEPA will be initiated immediately upon signing the ROD.
2. **Management Considerations:** A *Management Consideration* describes a river value that is currently in a protected state; however, corrective actions may be applied to specific localized areas to further enhance the river value. Most of the actions identified as enhancing river values will be implemented upon signing of the ROD, with a few exceptions, particularly those that fall into a CE category.
3. **Issues/Opportunities:** The terms *Issue/Opportunity* are applied to those areas in the river corridor that must be addressed as part of the user capacity mandate required under the Ninth Circuit Ruling on the 2005 Merced River Plan. These actions do not directly protect or enhance river values, but they are integral to generating the user capacity numbers, which are based on parking, overnight accommodations, transportation and circulation and must not through their implementation impact river values leading towards adverse or degraded conditions. Many of these actions were brought-up during scoping and are issues that the public is most interested in. Most of these actions will require follow-on NEPA upon signing of the ROD. Those issues/opportunities that are most integral to user capacity will be a higher priority for implementation.

## How the Alternatives are Organized

Many of the actions described in the alternatives are considered “Common to All” and are detailed in the section “Actions Common to Alternatives 2-6” (see page 8-53). These “Common to All” actions are those actions that would be implemented regardless of individual alternative actions to protect river values as they are considered appropriate management responses to issues or concerns in the river corridor.

The individual alternatives do not repeat these actions; rather, readers should be aware that each alternative is made up of both the Actions Common to Alternatives 2-6 as well as the actions that vary across the alternatives (See Figure 8-5). The actions unique to each alternative (not Common to All) are outlined in each alternative description (See Figure 8-3). The actions that vary across alternatives are reflective of varying degrees of ecological restoration, levels of user capacities, and of varying types of visitor experiences. (See Figure 8-4)

### Overview

Each alternative description follows the same structure. At the beginning of each alternative there is an overview of the alternative. This overview contains information on the goals of the alternative, the general guiding principles of the alternative as well as actions in the alternative that are corridorwide.

### Maps

Maps of key locations in the Merced River Plan corridor are provided to orient readers to the planning areas and the context in which the actions and facilities are situated.

Figure 8-3: How to Read the MRP Alternatives

<b>How to Read the MRP Alternatives</b>	
<b>Part 1</b>	<b>Overview of Each Alternative</b>
	<ul style="list-style-type: none"> <li>• Overview and Guiding Principles of Alternative</li> <li>• Major Topic Areas and Associated Summary Tables</li> <li>• Summary of Actions to Protect and Enhance River Values</li> <li>• Management of User Capacities, Land Use, and Facilities</li> </ul>
<b>Part 2</b>	<b>Detailed Description of Each Alternative</b>
	<ul style="list-style-type: none"> <li>• Actions to Protect and Enhance River Values (Segment-by-Segment Actions in Alternatives)</li> <li>• User Capacity, Land Use, and Facilities Management (Segment-by-Segment Actions in Alternatives)</li> <li>• Maps Series (Site-specific Management Actions in Major Planning Areas)</li> <li>• Facilities and Services Analysis Tables (Which Facilities are Retained, Relocated, or Removed)</li> <li>• Conceptual Site Drawings (Site-specific Management Actions in Major Planning Areas)</li> </ul>
<b>Part 3</b>	<b>Actions Considered But Dismissed</b>
	<ul style="list-style-type: none"> <li>• List of Suggested Actions with Rationale Why Dismissed</li> </ul>
<b>Part 4</b>	<b>Alternative Cost Comparison</b>
	<ul style="list-style-type: none"> <li>• Details Defining the Potential Cost of Each Alternative</li> </ul>
<b>Part 5</b>	<b>User Capacity Comparison</b>
	<ul style="list-style-type: none"> <li>• Illustrations of Site-specific Actions in Alternatives</li> </ul>
<b>Part 6</b>	<b>River Value Analysis</b>
	<ul style="list-style-type: none"> <li>• Impacts to River Values Defined by Alternative</li> </ul>



Figure 8-4: What Adds Up to An Alternative

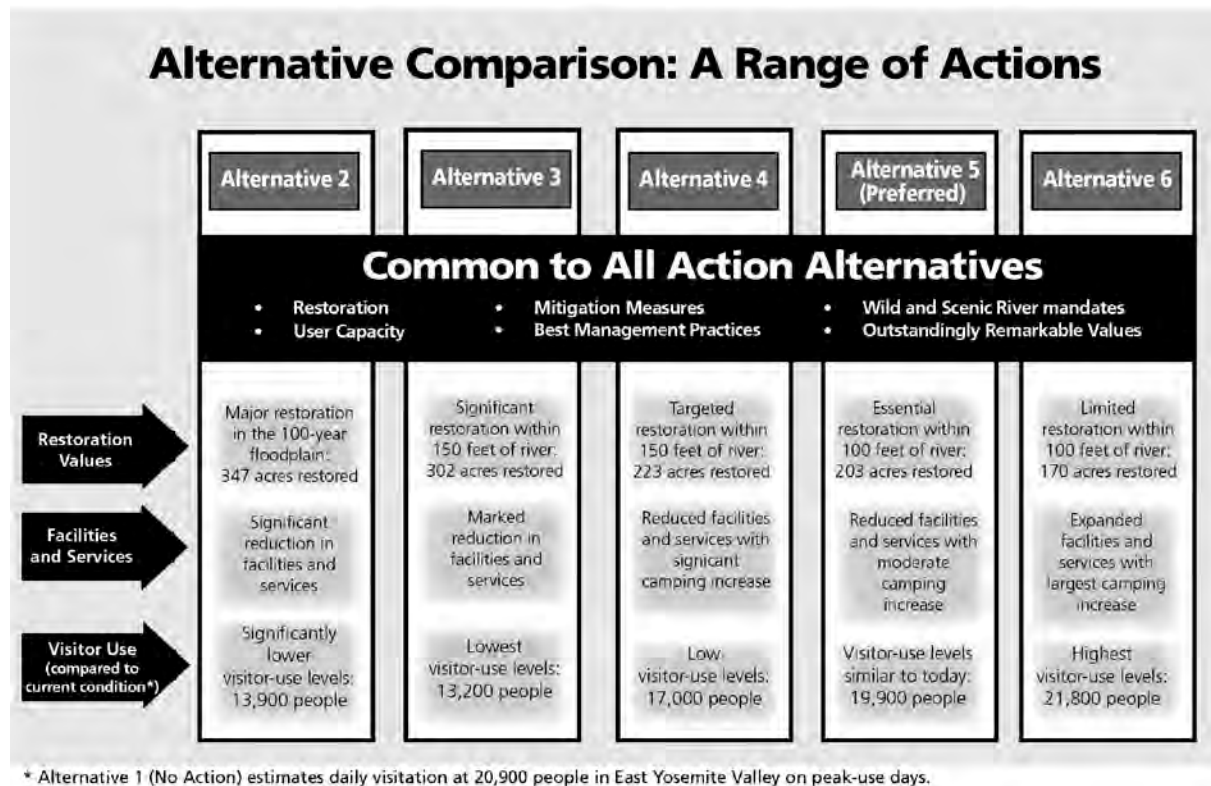
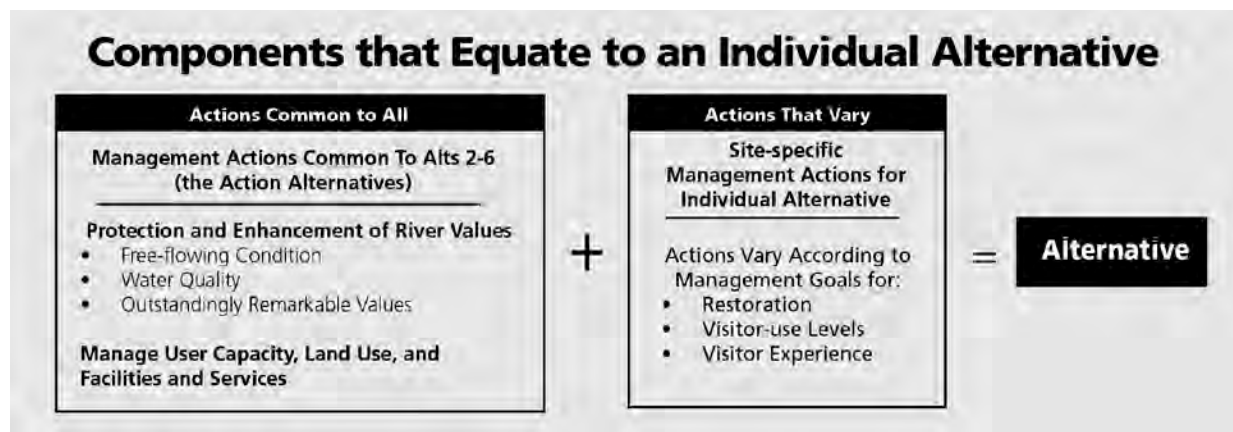


Figure 8-5: Components that Equate to an Individual Alternative



### *Detailed Description of Alternatives by Segment*

Then what follows is a more detailed description of the actions that form the basis of each alternative. These actions are grouped under two main topic areas; summary actions to protect and enhance river values (i.e., Biological Values and Cultural Values) and a summary of User Capacities, Land Use and Facilities Management (i.e., camping, lodging, transportation). These topic areas are organized by segment.

### *Necessity of Facilities and Services*

In each alternative the land use and visitor experience goals, coupled with specific measureable limits on use necessitate a set of facilities and services in accordance with the WSRM mandated discussed in Chapter 7. This section provides a list of facilities by segment, the action to be taken under the corresponding alternative, and presenting a justification for whether it is feasible to relocate the facility or service outside the river corridor.

The NPS used the following definitions as a basis for evaluating whether it would be feasible to relocate facilities outside the river corridor:

- **Feasible:** For the purpose of this analysis, “feasible” is defined as capable of being done, effected, or accomplished.
- **Infeasible:** For the purpose of this analysis, “infeasible” is defined as impracticable, incapable of being put into practice with the available means, or unsuitable for practical use or purposes.

**Feasibility Factors** – To determine whether NPS could accomplish the relocation of a facility, the NPS considered the factors including public safety, economic, engineering- and/or building-code requirements, as well as resource conditions. Additional factors include the availability of land suitable for such uses and the location of the existing road system within and outside the river corridor. Some proposed relocations require a sequencing of actions, such as the relocation of the shuttle maintenance function to the Government Utility Building followed by the removal of the Yosemite Village Garage facility. NPS staff also considered what actions were most important to protect river values and to provide for quality visitor experiences.

With this in mind, park staff has deliberated very fundamental questions about the relocation of facilities:

1. Could this action be implemented in the near term?
2. If not, what impacts are likely to occur prior to implementation?
3. Are there any intermediate steps short of relocation that could mitigate impacts?
4. What actions will be required to continue to operate in the existing location?
5. Would the gain be worth the cost, in terms of real dollars, and direct and indirect impacts to park resources or visitor experiences?
6. If a facility is relocated, is a suitable relocation area located within a reasonable time and travel distance? If a service is discontinued, what options are available outside the park and what would be the effect or requiring park visitors or employees to obtain the service outside the park? Travel time from Yosemite Valley to the gateway communities of Mariposa, Oakhurst, Groveland or Sonora—where commercial services are readily available—ranges from 50-75 miles and takes 1 to 1-1/2 hours to drive to. Much of the land bordering the park is owned by the federal government (U.S. Forest Service, and Bureau of Land Management) and is unlikely to be developed by the private sector to meet visitor needs.

### *Conceptual Site Drawings*

Site Plan drawings are included for a few key locations in the discussion of the Alternative. These locations include Curry Village, Yosemite Village Day-use Parking Area, Valley Maintenance Yard, and Yosemite Lodge Day-use Parking Area. These drawings are provided to demonstrate where facilities would be removed, relocated or constructed according to actions more fully described by project alternatives. These

drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concept presented here.

### ***River Value Analysis***

At the conclusion of each alternative description, there is an analysis of how each alternative is protective of River Values. Consistent with Section 10(a) of the Wild and Scenic Rivers Act to “protect and enhance the values which cause [the river] to be included in [the wild and scenic rivers] system,” all actions included in each alternative must be protective of river values. This section demonstrates how the actions to address management concerns and considerations (i.e., river value restoration) in combination with the actions addressing issues/opportunities (i.e., user capacity elements) would be protective of river values.

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## ALTERNATIVE 1: NO ACTION ALTERNATIVE

### Overview

Alternative 1, also known as the “No Action Alternative,” is required by NEPA implementing regulations and serves as a baseline from which to compare the action alternatives. Alternative 1 represents existing conditions in 2011, when the NPS completed research studies intended to assess conditions of the Merced River, and the continuation of current park management into the future. This alternative assumes that current trends in the conditions of natural and cultural resources and visitor experiences would continue, consistent with the management activities that are ongoing under currently approved plans. Future actions that would require additional planning and environmental compliance could still occur, independent of the *Merced River Plan/DEIS*, but they are not considered part of the No Action Alternative for the purposes of conducting environmental compliance for the *Merced River Plan*.

The overall management direction of Alternative 1 is based on current guiding management documents. The 1980 *General Management Plan* is the primary guiding document for park management, along with subsequent park-wide management documents such as the *Wilderness Management Plan* (1989), *Concessions Services Plan* (1992), *Fire Management Plan* (2004, with operational updates in 2009), and the *Invasive Plant Management Plan* (updated in 2010). In addition to following park-specific management policy, the NPS would also continue to comply with federal laws, including the NPS Organic Act, the Endangered Species Act, the National Historic Preservation Act, the Clean Water Act, and all other federal laws, directives, policies, and executive orders pertaining to park management.

Under Alternative 1, the NPS would not adopt a comprehensive management plan to protect and enhance river values and address user capacity and land use in the corridor. The two prior versions of the river plan would not be in effect, because the courts determined that prior versions of the plan were invalid. Ecological restoration actions would be limited to those that would only require a Categorical Exclusion in compliance with NEPA, and those identified in the 2009 Settlement Agreement. The river corridor would be ¼ mile on either side of the ordinary high-water mark because the WSRA provides for these default boundaries in the absence of agency designated boundaries. The segment classifications would be the same as those in the 1982 National Rivers Inventory in which the river was designated wild and scenic. There would no Section 7 Determination Process. The ORVs, as articulated in Yosemite’s 1996 *Draft Yosemite Valley Housing Plan*, would continue to be protected and enhanced. There would be no established limit to the number of visitors or vehicles that would be allowed within the corridor. There would be no changes to existing facilities, transportation systems or services.

### *Summary of Current Actions and Issues Affecting River Values*

This section is intended to summarize (1) those actions that would protect and enhance river values that are already underway, and (2) issues that affect river values corridorwide. This section is not intended to summarize all the current management of resources in the river corridor; rather, it focuses on the actions that are directly related to issues identified in Chapter 5. This provides a baseline for comparing the actions that might be taken under the action alternatives (Alternatives 2-6) to protect and enhance river values.

The following conditions would continue throughout all segments of the Merced River corridor under Alternative 1.

## Free-Flowing Condition

Impediments to free flow and their associated impacts would continue in all segments.

- Riprap and revetment – All riprap would remain in place.
- Abandoned infrastructure in river channel – Abandoned underground infrastructure in the river channel and meadow floodplains can alter the free-flowing condition of the river. This infrastructure, including remnants of former sewer treatment facilities, sewer and water lines, man-holes, and former bridge abutments, would remain in place.
- Large Wood Management – Large woody debris would continue to be removed from the river due to safety concerns and infrastructure protection, as it has for decades, particularly in the areas around the campgrounds and areas where rafting occurs.

## Water Quality

As reported in 2010, water quality throughout the corridor would be expected to remain high, with isolated instances of minor contamination especially after storm events, but would not be expected to exceed water quality standards. Water quality would continue to be monitored and managed to meet NPS standards (which are higher than state water quality standards).

## Biological Values

Under Alternative 1 (No Action), ecological restoration actions would be limited to those projects that would only require a Categorical Exclusion in compliance with NEPA, and those identified in the 2009 Settlement Agreement. The Settlement Agreement outlines that the NPS could proceed with restoration projects at the El Portal Greenemeyer sand pit, drainage improvements at Bridalveil, Cook's, and El Capitan Meadows, comprehensive restoration at El Capitan Meadow, and riverbank restoration at North Pines Campground. Some ecological restoration at North Pines Campground and Cook's Meadow has already occurred and is listed under cumulative effects (Appendix B). Table 8-1 gives representative examples of ecological restoration actions in the Merced Wild and Scenic River corridor that can take place under Alternative 1.

**TABLE 8-1: SUMMARY OF ACTIONS TO PROTECT AND ENHANCE BIOLOGICAL VALUES - ALTERNATIVE 1 (NO ACTION)**

Yosemite's Existing Ecological Restoration Program	
Ecological restoration actions assist the recovery of damaged ecological systems with the aim to bring damaged systems back to a condition that is structurally and functionally similar to the pre-disturbance state. Restoration takes place on a case-by-case basis, in compliance with the 2009 Settlement Agreement. Any action taken will comply with NEPA and other laws and policies.	
<ul style="list-style-type: none"> <li>• Re-routing trails out of sensitive areas</li> </ul>	Example: Move established trails farther from the river Example: Add boardwalks across sensitive meadow habitat Example: Restore informal trails to avoid crossing sensitive areas
<ul style="list-style-type: none"> <li>• Removing abandoned infrastructure</li> </ul>	Example: Remove outdated utility infrastructure to restore a wetland's hydrology and connectivity to adjacent riparian floodplain Example: Remove an old building foundation and bring in topsoil to allow for native plant establishment
<ul style="list-style-type: none"> <li>• Repairing damaged riverbanks</li> </ul>	Example: Fence highly eroded riverbanks Example: Plant willows to stabilize riverbanks
Monitoring: An essential component in any restoration project is to monitor completed projects to ensure that project goals are met.	

Despite some ongoing impacts that would occur under the No Action Alternative, the NPS would continue to mitigate some impacts to biological values. As noted above, the NPS would continue restoration projects in several Yosemite Valley meadows and on the riverbank in certain places (per the Settlement Agreement). Specifically, the NPS would proceed with restoration projects at Bridalveil, Cook's, and El Capitan Meadows, as well as riverbank restoration at North Pines Campground. Ecological restoration at North Pines Campground would be limited to planting willows and alders along approximately 300 linear feet of riverbank, using a bobcat or small excavator to move rocks for planting, planting herbaceous plants on the terrace, and mulching with native leaves and duff. Other riverbank restoration projects that would require a categorical exclusion for NEPA compliance could also occur. The NPS would also continue invasive species control where such plants are present, as well as conifer removal from some meadows.

The following issues identified in Chapter 5 would remain under this alternative:

- Meadow trails – Informal trails in meadows would remain.
- Encroaching conifers in meadows – Conifers would continue to encroach in meadows. The *Fire Management Plan* would continue to be implemented, thus addressing some of these encroachment areas through fire reintroduction.
- Riparian habitat – The current level of protection for the riparian zone along the beds and banks of the Merced River in all segments would remain in place.
- Riparian restoration and river access – Localized riverbank erosion and scouring effect associated with bridges would remain. Visitor use continues on sensitive banks of the Merced River. Locations include those adjacent to Lower and North Pines Campgrounds, Yosemite Lodge beach access, Swinging Bridge Picnic Area, Sentinel Beach Picnic areas, Cathedral Beach Picnic Area, Devil's Elbow, riverside areas between Pohono Bridge and the El Portal Road/Big Oak Flat Road intersection, and along the Valley Loop Trail.

## Cultural Values

Under Alternative 1 (No Action), park staff would continue to identify, document, monitor, evaluate, and protect significant archeological sites in consultation with traditionally associated American Indian tribes and groups through monitoring for changing site conditions, developing and implementing treatment measures, implementing visitor and employee education, and conducting research.

However, many resource impacts deriving from visitor and administrative use in all segments would continue to be present. Undertakings with potential to impact archeological and ethnographic resources and activities would be subject to review through compliance with the National Historic Preservation Act and required consultation with the State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the traditionally associated American Indian tribes and groups.

- Archeological sites (general) – Informal trails, and non-essential roads and infrastructure on archeological sites would remain. Bike paths, campsites, roads, bridle paths, parking, staging areas, and trails remain on sensitive areas. Graffiti and climbing would continue on rock art and other sensitive features.

## Scenic Values

- Scenic vista points – Traffic congestion would continue to affect scenic views, as would vegetation growth that blocks views, social trails, and trampled vegetation and riverbanks. Under the No Action Alternative, no scenic vista management actions would be taken in the Merced River corridor.

### *Summary of User Capacities, Land Use and Facilities Management*

Alternative 1 (No Action) would perpetuate the kinds and amounts of use that exist today (See Table 8-2).

Under the No Action Alternative, existing user capacity management actions would continue. These include the use of the wilderness permit system for overnight use of the backcountry and the reservations systems for camping and lodging accommodations. Day use capacity would be managed through the active management of day-use parking. Traffic staff would be needed to direct parking in Yosemite Valley, in particular, and during peak use days inbound traffic may be diverted.

Pilot transit programs would continue to provide limited additional service to destinations within the river corridor and Yosemite Valley in particular.

**TABLE 8-2: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 1 (NO ACTION)**

	Unit Type	Units	People
<b>Wilderness Above Nevada Fall</b>			
Visitor Overnight Use	Zone Capacities & Beds	380	380
Visitor Day Use	Day Hikers	350	350
Employee Housing	Employee Beds	15	15
Administrative Day Use	Day Patrols	5	5
<b>Yosemite Valley</b>			
Visitor Overnight Use	Rooms & Campsites	1,500	6,564
Visitor Day Use	Parking Spaces	-	8,272
Employee Housing	Employee Beds	1,315	1,315
Administrative Day Use	Parking Spaces	166	332
<b>Gorge</b>			
Visitor Overnight Use	Rooms & Campsites	-	-
Visitor Day Use	Parking Spaces	180	869
Employee Housing	Employee Beds	9	9
Administrative Day Use	Parking Spaces	2	4
<b>El Portal</b>			
Visitor Overnight Use	Rooms & Campsites	-	-
Visitor Day Use	Parking Spaces	214	740
Employee Housing	Employee Beds	192	192
Administrative Day Use	Parking Spaces	610	1,220
<b>South Fork Above Wawona</b>			
Visitor Overnight Use	Permits	20	20
Visitor Day Use	Day Hikers	6	6
Employee Housing	Employee Beds	-	-
Administrative Day Use	Day Patrols	1	1
<b>Wawona</b>			
Visitor Overnight Use	Rooms & Campsites	203	865
Visitor Day Use	Parking Spaces	-	1,295
Employee Housing	Employee Beds	121	121
Administrative Day Use	Parking Spaces	30	60
<b>South Fork Below Wawona</b>			
Visitor Overnight Use	Backpackers	3	3
Visitor Day Use	Day Hikers	3	3
Employee Housing	Employee Beds	-	-
Administrative Day Use	Day Patrols	1	1



## Visitor Overnight Capacity

### Camping

Under Alternative 1, campgrounds in the Merced Wild and Scenic River corridor, including Yosemite Valley, would remain in their present locations and configuration, and at their existing capacities. The total camping capacity in the corridor under Alternative 1 would be 565 campsites accommodating up to 3,510 people per night. Table 8-3 outlines existing campground locations in the Merced Wild and Scenic River corridor and the capacities of those campgrounds.

**TABLE 8-3: CAMPING FACILITIES- ALTERNATIVE 1 (NO ACTION)**

Existing Locations	Alt 1 (No Action)
<b>Segment 2: Yosemite Valley</b>	
Backpackers Campground	25 walk-in sites
Camp 4 Campground	35 walk-in sites
Lower Pines Campground	76 sites
North Pines Campground	86 sites
Upper Pines Campground	240 sites
Yellow Pine Administrative	4 group sites
<b>Segment 7: Wawona</b>	
Wawona Campground	99 sites (one group site and two stock use sites)
<b>Total Camping in Corridor</b>	<b>565 sites</b>

### Lodging

Under Alternative 1, lodging facilities in the Merced Wild and Scenic River corridor, including Yosemite Valley, would remain in their present locations and configuration, and at their existing capacities. The total lodging capacity in the corridor under Alternative 1 would be 1,160 units accommodating up to 3,979 people per night. Table 8-4: Lodging – Alternative 1 (No Action)

outlines the existing lodging locations in the Merced Wild and Scenic River corridor and their capacities.

**TABLE 8-4: LODGING – ALTERNATIVE 1 (NO ACTION)**

Existing Locations	Alt 1 (No Action)
<b>Segment 1: Wilderness</b>	
Merced Lake High Sierra Camp	22 units (60 beds)
<b>Segment 2: Yosemite Valley</b>	
Ahwahnee Hotel	123 rooms
Housekeeping Camp	266 units
Curry Village	400 units*
Yosemite Lodge	245 rooms
<b>Segment 7: Wawona</b>	
Wawona Hotel	104 rooms
<b>Total Lodging in Corridor</b>	<b>1,160 units</b>
*Curry Village's number accounts for the removal of temporary guest lodging units at Boys Town, per the 2009 Settlement Agreement.	

## Visitor Day Use Capacity and Transportation Options

Under Alternative 1, parking and transportation infrastructure remain the same as existing conditions. Parking areas would remain at their current locations and the supply of spaces would be the same. During peak use periods parking demand would generally exceed the formally designated parking supply, and the number of vehicles searching for parking remains in the transportation circulation system and cause considerable traffic congestion and crowding.

In 2011, for example, 68 out of the 100 days of the peak summer season had more vehicles in Yosemite Valley than there were parking spaces. On the highest visitation day in 2011, as many as 6,300 vehicles were in East Yosemite Valley at one time with only 5,200 available spaces (200 of which producing vegetation or related impacts), and an estimated 1,200 vehicles were on East Valley roadways that can handle only 400 circulating vehicles without unacceptable congestion impacts (long travel times or growing queues at intersections and searching/waiting for parking spaces). On many high use days in recent years, vehicle queues form in mid-to-late afternoon along Northside Drive from Yosemite Lodge to Camp 6. On some days, the queue may reach past Curry Village as far as Stoneman Bridge (1.5 miles). This increases average travel times from Curry Village to Camp 4 to 30 minutes or more; under “free flow” conditions the trip takes about 8 minutes. It also increases the likelihood of traffic jams that may last for hours.

Under these conditions, traffic management staff try to react to specific traffic circulation, flow, and parking problems, sometimes implementing temporary access restrictions to East Yosemite Valley or maintaining emergency lanes (which further congests traffic).

Under Alternative 1, transportation models indicate that during the peak 100 days of summer use, there would be 81 days where inbound traffic exceeds the supply of parking spaces in East Yosemite Valley and creates congestion on roads as described above. Under this no-action alternative, use would also be allowed to increase in future years because there are no formal user capacities prescribed for day use. Taken together, the ad hoc traffic management actions (the shunt, emergency lane closures, directed parking at lots, traffic management at pedestrian crossings) are stop-gap measures to control impact and avoid gridlock, but traffic and parking conditions on these days will be poor.

The total day-use parking spaces available in Yosemite Valley under Alternative 1 would be 2,337 and corridorwide the total day-use parking spaces available under would be 3,021. Table 8-5 summarizes the number of parking spaces for day use for each relevant segment of the river corridor.

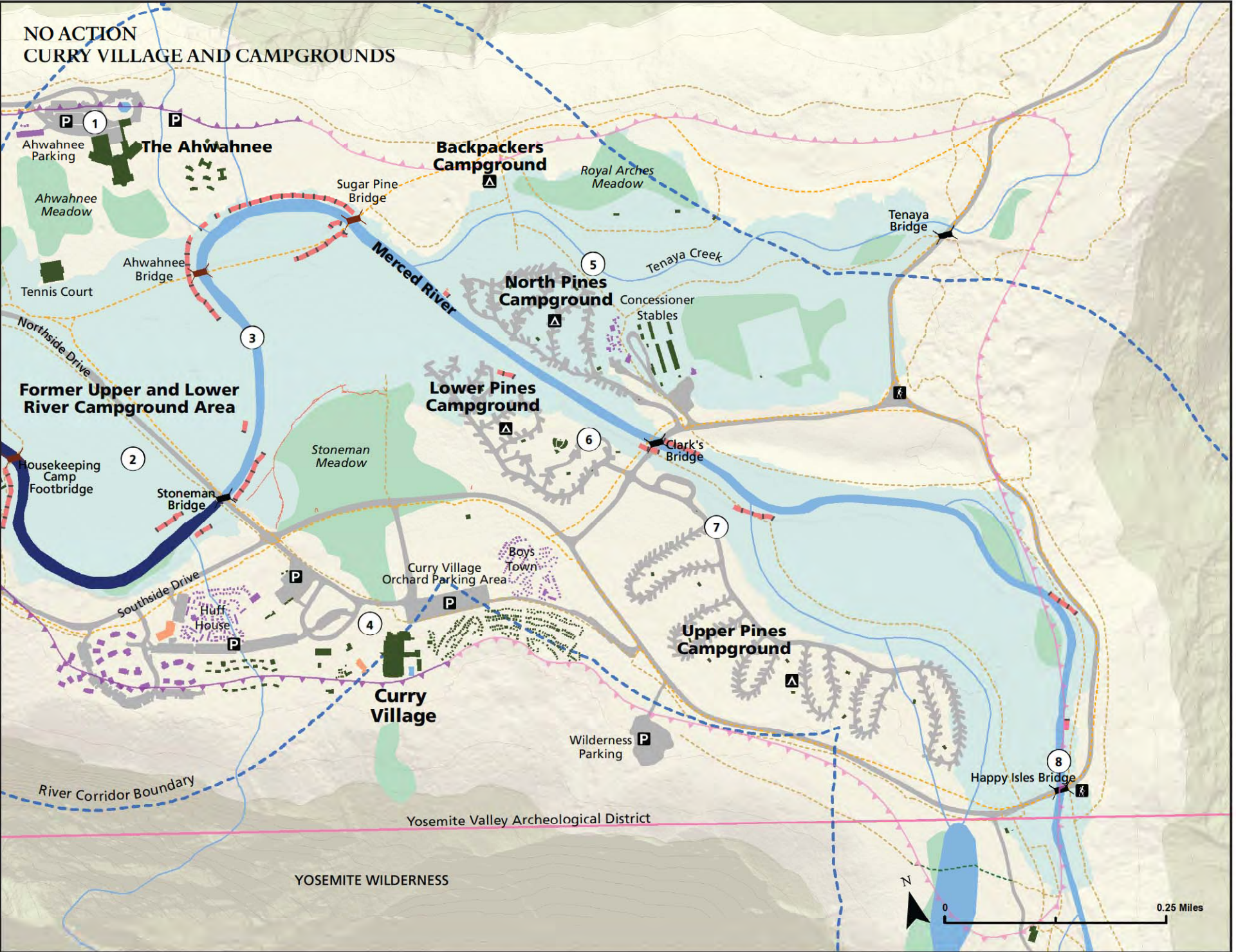
Under Alternative 1, transit would be provided to and around Yosemite Valley using a combination of in-valley free shuttle bus service, regional transit, and private tour buses. Under Alternative 1, public transit options would include all existing routes and continuation of the 2012 summer pilot program for expansion of transit on the Highway 120 corridor.

**TABLE 8-5: DAY-USE PARKING AREAS – ALTERNATIVE 1 (NO ACTION)**

Location	Alt 1 (No Action)
Segment 2: Yosemite Valley	2,337 spaces
Segment 3: The Gorge	180 spaces
Segment 4: El Portal	214 spaces
Segment 7: Wawona	290 spaces
Total Parking	3,021 spaces



# ALTERNATIVE 1: NO ACTION



## EAST YOSEMITE VALLEY: CURRY VILLAGE AND CAMPGROUNDS

- 1. The Ahwahnee**
  - Ahwahnee Meadow Former Golf Course and Tennis Court: Meadow and oak habitats around The Ahwahnee would continue to contain ditching, fill material, encroaching conifers and abandoned infrastructure.
  - Ahwahnee Hotel Parking: Parking at The Ahwahnee would not meet overnight and day-use demand, and the historic gate house would not be restored.
  - Ahwahnee Hotel Services and Facilities: The National Historic Landmark would have 123 lodging units and provide visitor services, including food service, dining, bar, gift shop, sweet shop and pool.
- 2. Former Upper and Lower River Campground**
  - Former Upper and Lower River Campground: This area, which is critical to the hydrologic connectivity between Ahwahnee and Stoneman meadows, and once contained 262 campsites before the 1997 flood, would continue to passively restore to natural conditions.
- 3. River Reach Between Clark's and Sentinel Bridge**
  - River Reach Between Bridges: Between Clark's and Sentinel bridges, the river channel would continue to lack channel complexity and be shallower and wider than naturally would occur.
- 4. Curry Village Area**
  - Residential Area: Temporary accommodations at Huff House would continue to house concessioner employees.
  - Curry Village Lodging: There would be 400 guest units, which accounts for the removal of temporary guest lodging units at Boys Town, per the 2009 Settlement Agreement.
  - Stoneman Meadow: Ditching, roads, and informal trails would remain in Stoneman meadow.
  - Curry Orchard Parking Area: The parking lot would be unimproved and contain 424 parking spaces.
  - Curry Village Services and Facilities: The facilities and services would be unchanged. The grocery store, pizza deck and bar, pavilion, swimming pool, bike stand, raft rental, ice rink, Happy Isles Snack Stand, and the Nature Center at Happy Isles would continue to provide visitor services.
  - Curry Village Wilderness Parking Area: The parking lot would be unimproved and contain 190 parking spaces.
- 5. North Pines and Backpackers Campground Area**
  - Backpackers Campground: There would be 25 sites in close proximity to Tenaya Creek.
  - Royal Arches Meadow: The meadow would contain tiles, pipes and conifer saplings, as well as the remains of a former road bed.
  - North Pines Campground: There would be 86 campsites.
  - Concessioner Stables in Yosemite Valley: The stables would be used by the concessioner to provide day rides in the Valley and house stock animals used to operate the High Sierra camps. The kennel service would continue to operate.
  - Valley Campgrounds: Campsites would remain in close proximity to the river, without formal designated river access points.
  - Eroded Riverbanks: Heavy visitor use of the riverbanks along some river reaches would continue, leading to denuded areas and accelerated riparian erosion.
- 6. Lower Pines Campground Area**
  - Western Portion of Lower Pines Campground Loop: The closed portion of Lower Pines campground, damaged by the 1997 flood, would continue to passively restore. Compacted soils and fill material would remain.
  - Lower Pines Campground: There would be 76 campsites.
- 7. Upper Pines Campground Area**
  - Upper Pines Campground: There would be 240 campsites.
  - Upper Pines RV Dump Station: The dump station would remain in close proximity to the river.
- 8. Happy Isles Area**
  - Happy Isles: Inadequate way-finding and unclear pedestrian circulation would continue, contributing to vegetation trampling.
  - Happy Isles Road Bridge, Stoneman, Clark's, Ahwahnee and Sugar Pine Bridges: The historic bridges would continue to have footings within the bed and banks of the Merced River, constricting the hydrologic flow of the river. The berm connecting the Ahwahnee and Sugar Pine Bridge would remain.
  - Pack Stock Trail: Trail from Concessioner Stables to Happy Isles would continue to be within the bed and banks of the river, subject to seasonal flooding, accelerated erosion, and sediment deposition in the river.

Scenic Vista Management: Conifers would continue to impinge views of iconic viewpoints and locations.

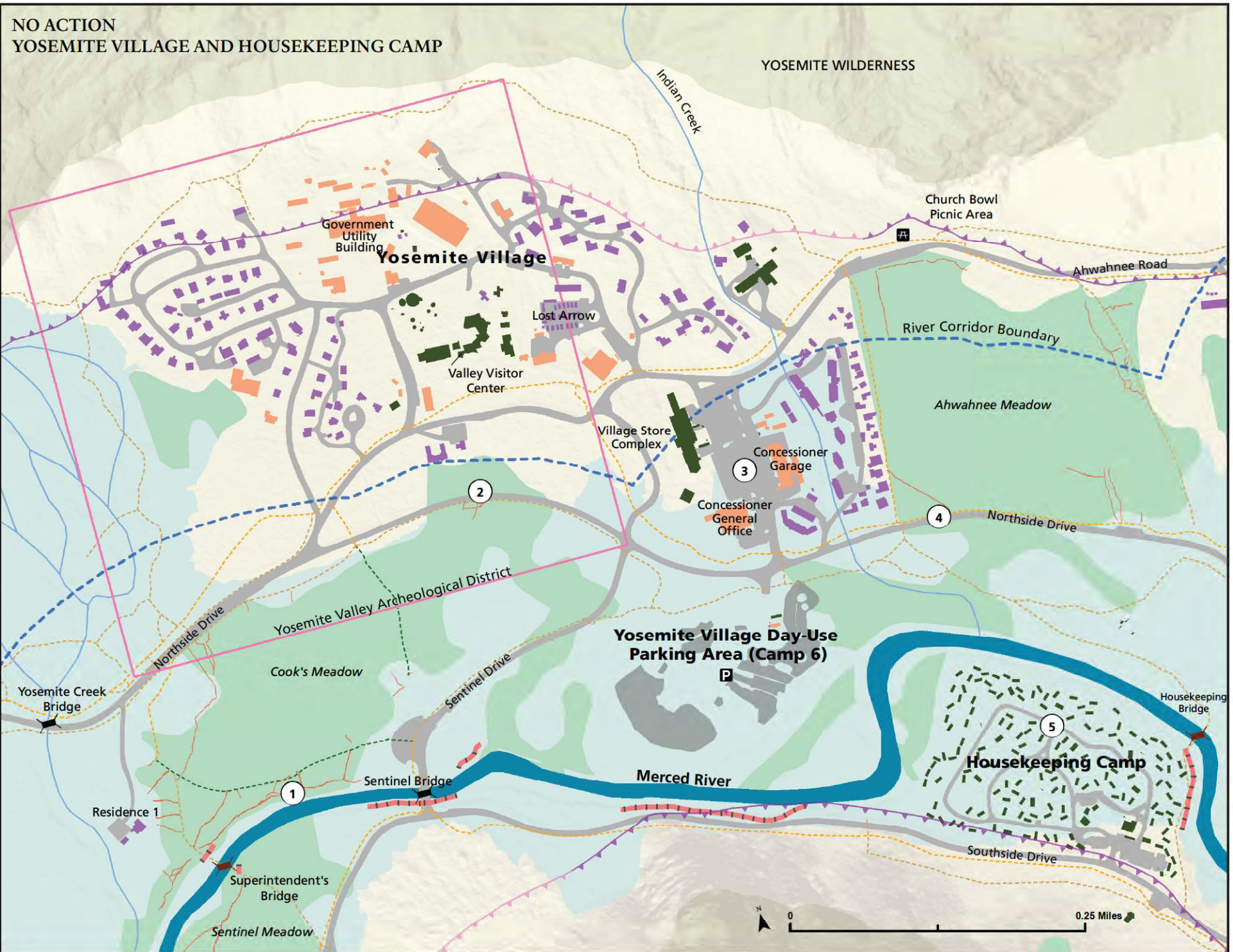
Cultural Resources: Informal and formal trails, pack stock trails, stock use and operational staging, vehicles and bicycles, camping, illegal campfires, graffiti, and trash would continue to impact culturally sensitive areas.



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# ALTERNATIVE 1: NO ACTION



## EAST YOSEMITE VALLEY: YOSEMITE VILLAGE AND HOUSEKEEPING CAMP

- 1. Superintendent's and Sentinel Bridge Areas**
  - Superintendent's and Sentinel Bridges: The bridges would continue to have footings within the bed and banks of the Merced River.
  - Southside Drive Intersection: The three-way intersection at Sentinel Drive and Southside Drive would remain.
- 2. Cook's Meadow Area**
  - Informal Shoulder Parking Along Meadows and Sensitive Habitat: Informal parking would continue along meadow edges and sensitive habitats at Cook's Meadow.
  - Cook's Meadow Abandoned Roadbed: The old roadbed north of Northside Drive between the Rangers' Club and the three-way stop would remain in meadow habitat.
- 3. Yosemite Village**
  - Way-finding from the Yosemite Village Day-use Parking Area: Visitors would continue to have difficulty finding the Village visitor center from the Camp 6 day-use parking area.
  - Yosemite Village Day-Use Parking Area: This parking area would continue to be a six-acre unimproved parking lot in close proximity to the river (portions in the 5- and 10-year floodplain). Approximately 517 vehicles would be accommodated. The Yosemite Village parking lot would continue to have approximately 237 parking spaces.
  - Concessioner General Office Building: The Concessioner General Office would remain in the river corridor and the 100-year floodplain.
  - Lost Arrow: Concessioner employees would continue to be housed in these temporary accommodations.
  - Intersections: The three-way intersection at Sentinel Drive and Southside Drive would remain, and the offset four-way intersection at Village Drive and Northside Drive (Camp 6) would remain.
  - Yosemite Village Services and Facilities: The level of services and facilities offered in Yosemite Village would remain unchanged.
  - Valley Garage: The Valley Garage, located in the river corridor and 100-year floodplain, would continue to service shuttles, tour buses, and visitor and concessioner vehicles.
  - Concessioner Employee Housing: Tecoya and Ahwahnee Row employee housing would continue to house concessioner employees.
- 4. Ahwahnee Meadow Area**
  - Ahwahnee Meadow: Northside Drive, the adjacent bike path and other formal trails would continue to bisect the meadow.
  - Ditches in Meadows: Human-constructed ditches would remain in meadows throughout Yosemite Valley.
- 5. Housekeeping Camp Area**
  - Housekeeping Camp Lodging: Many of the 266 Housekeeping Camp lodging units would continue to exist in the 2- to 10-year floodplain. The riprap that armors the riverbank to protect this infrastructure would be retained. High visitor use in this area would continue to result in denuded riverbanks in some areas.
  - Housekeeping Camp Services and Facilities: Visitor-use facilities would remain unchanged. Services would include shower houses, restrooms, laundry, and groceries.

Scenic Vista Management: Scenic Views: Conifers would continue to impinge views of iconic viewpoints and locations.

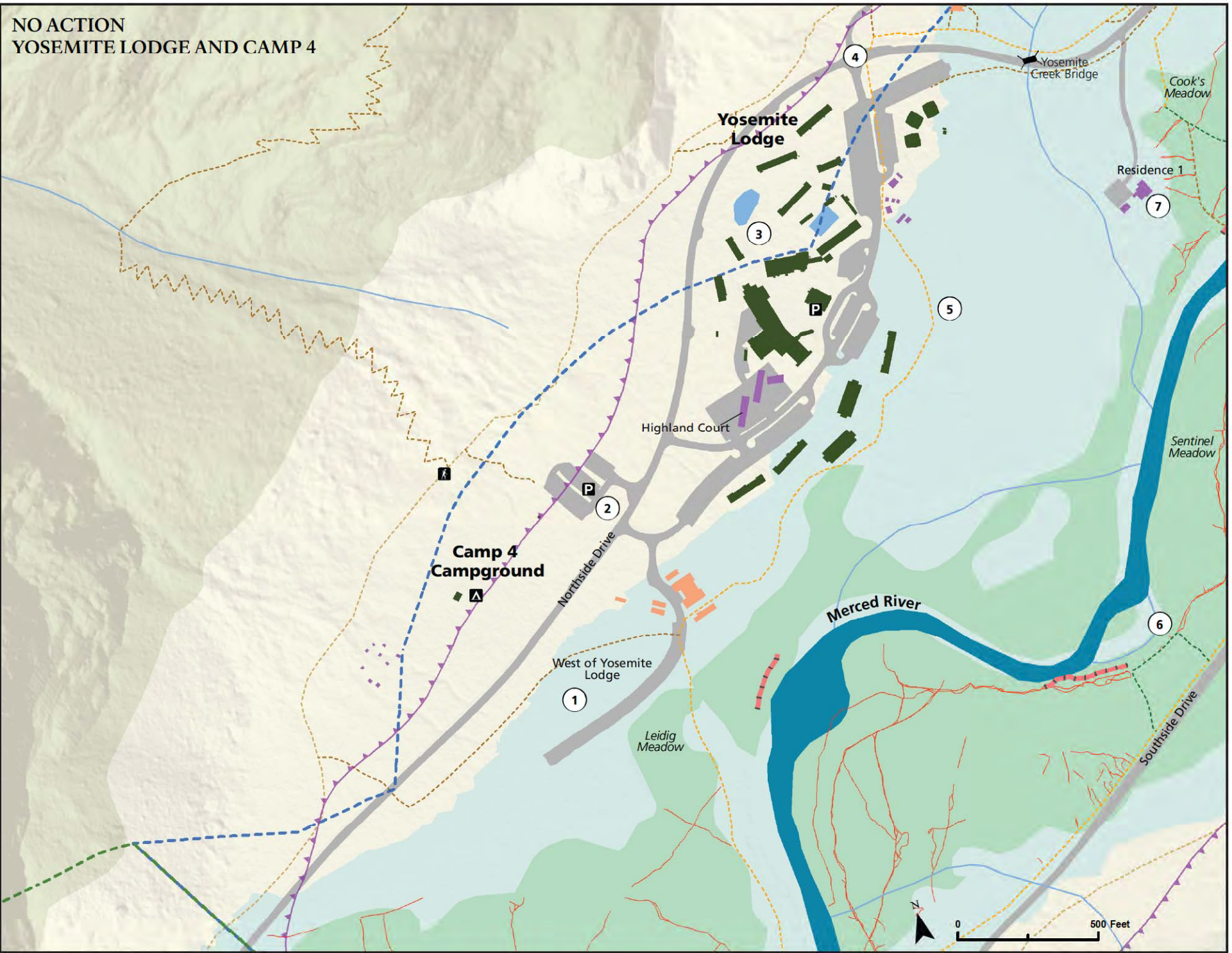
Cultural Resources: Informal trails and rock-climbing activities impact culturally sensitive areas. The LeConte Memorial Lodge National Historic Landmark would remain in "fair" condition.



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# ALTERNATIVE 1: NO ACTION



## EAST YOSEMITE VALLEY: YOSEMITE LODGE AND CAMP 4

- Yosemite Lodge Annex**
  - West of Yosemite Lodge: The west of Yosemite Lodge area would continue to provide over flow parking for tour buses and transit buses, day use and overnight use. The area was formerly employee housing prior to the 1997 flood.
  - Bike Path: The bike path through Leidig Meadow would remain in close proximity to the river and be inundated during parts of the year.
  - River Access: There would continue to be no designated river access point for visitors.
  - Former Yosemite Lodge Cabins: Fill and compacted soils would remain in the former cabins area, which were removed following the damage of the 1997 flood.
- Camp 4 Area**
  - Camp 4 Shuttle Stop: Camp 4 shuttle stop would remain an informal shuttle stop.
  - Camp 4 Campground: Camp 4 would have 35 campsites.
  - Camp 4 Parking: The unimproved parking lot at Camp 4 would contain 89 parking spaces.
- Yosemite Lodge Area**
  - Yosemite Lodge: There would be 245 lodging units. Yosemite Lodge would continue to be used for overnight lodging, parking, and food service. There would be no change to the level of service and facilities; services would include post office, pool, bicycle rental and snack stand. Buildings would remain within the 100-year floodplain.
  - Temporary Concession Employee Housing at Yosemite Lodge: Concessioner employees would continue to be housed at the Thousands Cabins and in temporary accommodations at Highland Court.
  - Day-use Parking Demand: Demand for day-use parking would continue to exceed supply during summer peak-use periods.
- Yosemite Lodge Intersection at Northside Drive**
  - Yosemite Lodge Intersection: Traffic congestion resulting from visitors using the on-grade pedestrian crossing at Northside Drive to get to Yosemite Falls would continue.
- Former Pine and Oak Area**
  - Former Pine and Oak cabins at Yosemite Lodge: The former Pine and Oak cabins area, removed following damage sustained from the 1997 flood, would continue to passively restore. Nonnative fill soils, soil compaction and an abandoned road network.
- Sentinel Meadow**
  - Sentinel Meadow Trampling: Sentinel meadow would continue to receive visitor use impacts.
- Residence 1**
  - Residence 1: This historic structure, also known as the Superintendent's House, would continue to be subject to recurring flooding and subsequent water damage. The poor condition of the historic interior finishes of the Superintendent's House and structural issues related to settling of the foundation would remain. Visitor use in this area would continue to cause radiating informal trails in Cook's Meadow.

Scenic Vista Management: Conifers would continue to impinge views of iconic viewpoints and locations.

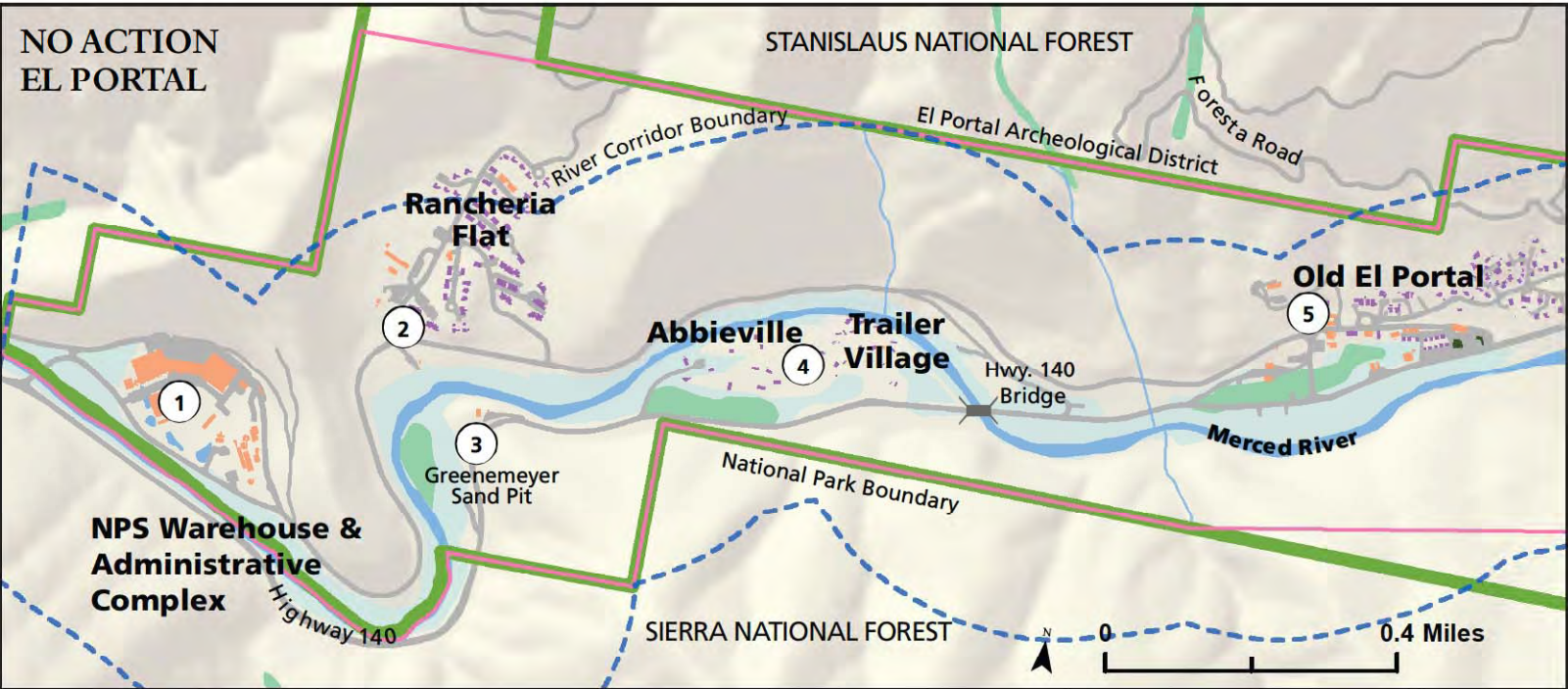
Cultural Resources: Non-technical climbing on a large bedrock mortar (pounding rock) near Lower Yosemite Falls would continue to cause impacts to the archeological resource.



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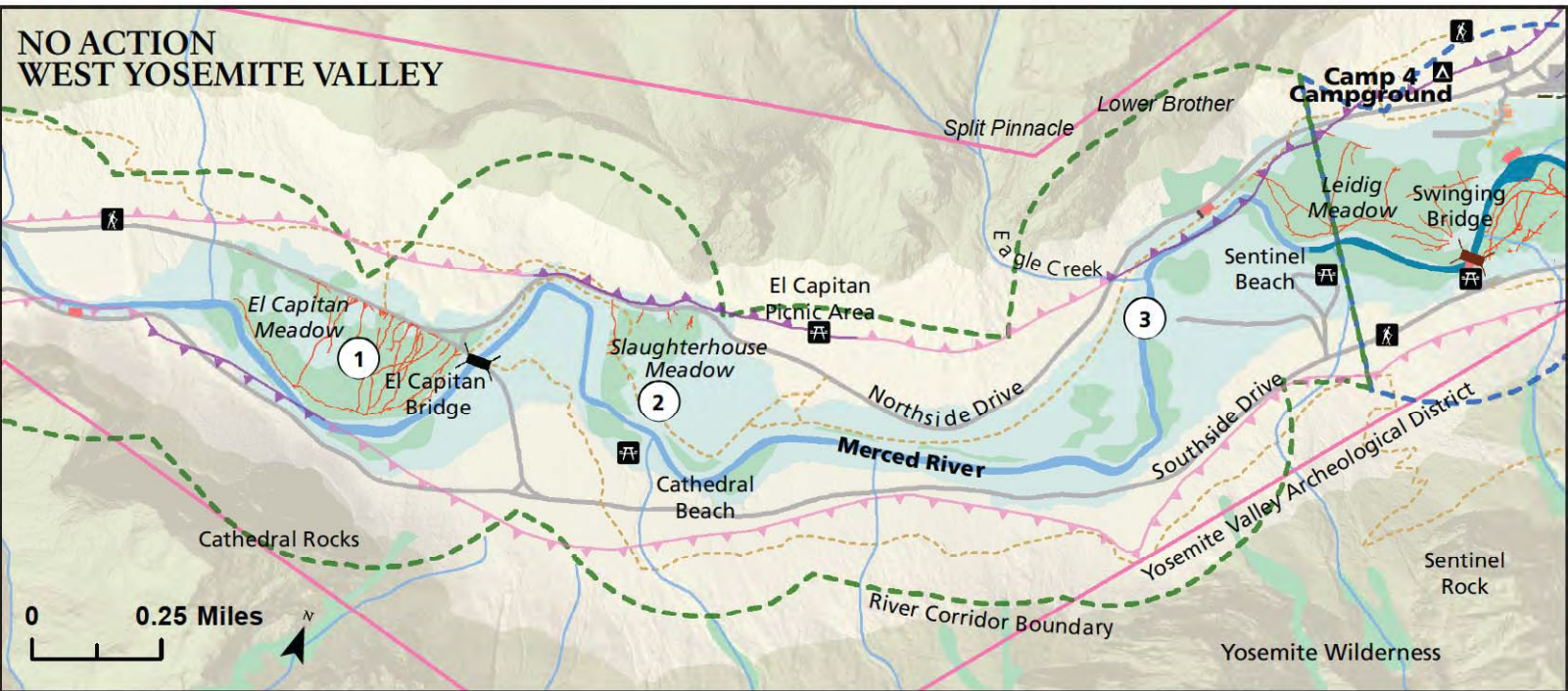
# ALTERNATIVE 1: NO ACTION



## EL PORTAL

1. Roadside Parking at the NPS Administrative Complex: Off-street parking between the Merced River and Foresta Road would continue to lack design features to prevent water contamination from automotive fluids, surface water runoff, or sediment transport.
2. Employee Housing at Rancheria Flat: Vacant lots would continue to exist in the Rancheria Flat area of El Portal.
3. Greenemeyer Sand Pit: This former mine operation area would continue to contain fill material that precludes natural flooding and regeneration of riparian plants.
4. Abbieville and Trailer Village
  - Housing: This area, located outside the 100-year floodplain, would continue to occupy a large development footprint and provide for housing land use for temporary NPS employees and park partner employees. Also, 36 private residences currently exist here.
  - Riparian Zone: Development, including paved roads, parking and compacted soils, would continue to exist in the riparian zone.
5. Old El Portal
  - Valley Oak Restoration: The valley oak population at El Portal exists in a generally protected state, but oak seedling recruitment is limited by competition from invasive species, parking under the drip lines of trees and associated soil compaction, herbivory, and existing development. Valley oaks are also sensitive to overwatering, pruning, grade changes, and asphalt covering the root system.
  - Odger's Fuel Storage Facility: Presence of this facility in the floodplain is not in compliance with NPS Floodplains Guidelines that require fuel storage facilities to be located outside of the 500-year floodplain.
  - Residential Area: Nine vacant lots exist in Old El Portal.

Cultural Resources: Informal trails, gravel roads, abandoned infrastructure, and visitor use would continue to impact culturally sensitive areas.



## WEST YOSEMITE VALLEY

1. El Capitan Meadow and Devil's Elbow
  - Valley Meadows: Conifers would continue to encroach into Yosemite Valley meadows.
  - Upstream of El Capitan Moraine: The river reach upstream of the El Capitan moraine to the Sentinel picnic area would continue to lack channel complexity and large wood accumulation.
  - El Capitan Meadow: Soil compaction and trampled vegetation would continue to exist due to informal trails and easy access to the meadow from roadside parking. The NPS would continue to remove invasive non-native plants following the Invasive Plant Management Plan and continue with prescribed fire following the Fire Management Plan, including mechanical removal of conifer saplings to reduce fuel load.
  - El Capitan Bridge, River access: No formal designated river access would be established along a high visitor use stretch of river with sensitive riverbanks.
  - El Capitan Shuttle Stop: The shuttle stop in this area would remain an informal shuttle stop.
2. Devil's Elbow and Slaughterhouse Meadow Area
  - Devil's Elbow: Visitor use between El Capitan Bridge and Devil's Elbow would continue to exceed the design of existing infrastructure. Visitor parking and river access would continue to create safety and resource concerns.
  - Valley Loop Trail impacts through meadows: The Valley Loop Trail would continue to pass through sensitive and sometimes inundated meadow habitat in Slaughterhouse Meadow and Bridalveil Meadow.
  - Cathedral Beach Picnic Area: Visitor use would continue to exceed the design of the existing infrastructure in this picnic area. There would be no formal river access and the parking would not be delineated. Picnic benches would continue to be easily moved through out the area.
3. Sentinel Beach and Swinging Bridge
  - Eagle Creek meadow and drainage: The Eagle Creek/Rocky Point sewage plant infrastructure would remain underground in Eagle Creek meadow. The natural braided morphology of Eagle Creek would continue to be channelized near Northside Drive.
  - Yellow Pine Administrative: Yellow Pine Campground would continue to be available for administrative use (four group sites for up to 120 people.)
  - Sentinel Beach Picnic Area: The picnic area would continue to be affected by high visitor use that exceeds the design of the existing infrastructure.
  - Leidig Meadow: Informal trailing in Leidig meadow would continue to cause extensive levels of habitat fragmentation, particularly in the area surrounding the north side of Swinging Bridge.
  - Valley Swinging Bridge river access: Current fencing along the bike path would continue to lead people to access the river upstream, river right of Swinging Bridge, causing streambank erosion.

Scenic Vista Management: Trees would continue to impinge views of iconic viewpoints and locations.

Cultural Resources: Informal trails, rock climbing, camping, vandalism, human waste and fire rings, would continue to impact culturally sensitive areas.

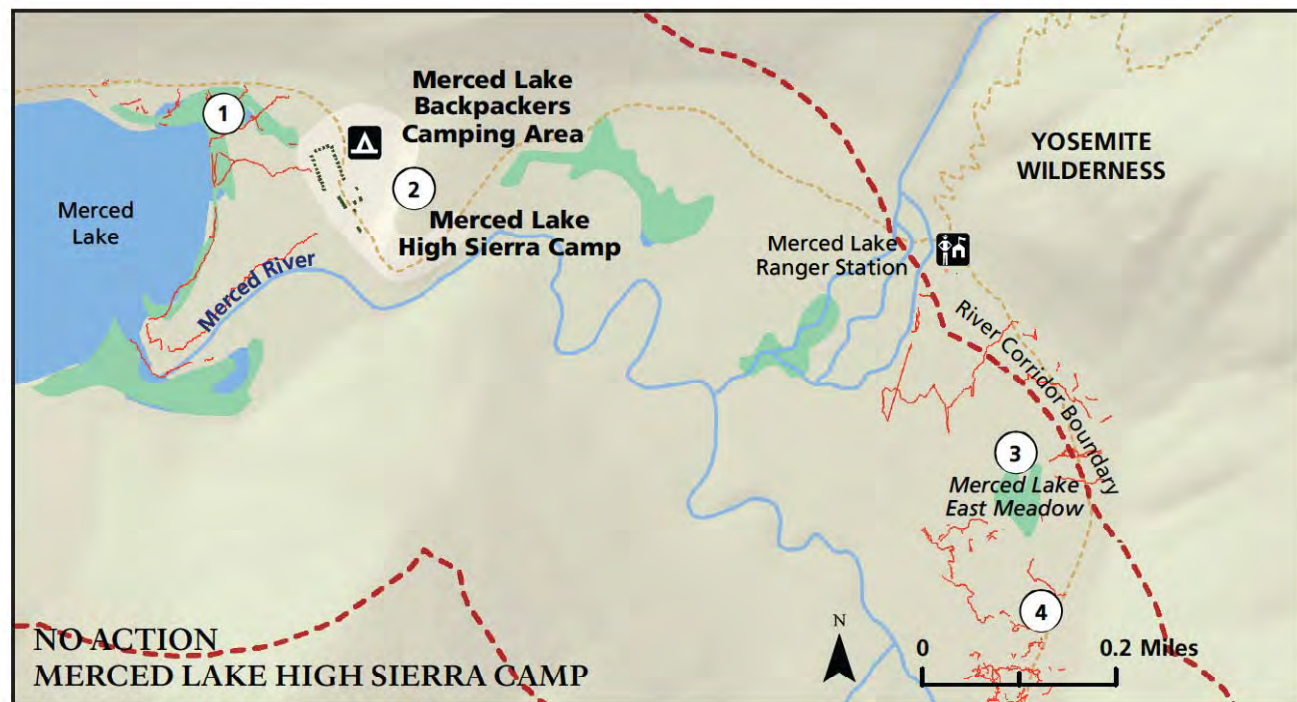
## Legend

Parking Area	Informal Trail	Designated Wilderness	Stream
Campground	Valley Loop Trail	Archeological District	Merced River (Rafting Prohibited)
Ranger Station	Bike Path	Housing	Merced River (Rafting Permitted)
Picnic Area	Boardwalk	Management Activities & Services	
Trailhead	Trail	Visitor Based Activities & Services	
100 ft. Contour	100-year Floodplain	Recreational Segment	
Revetment	Meadow & Riparian Vegetation	Wild Segment	
Calculated Rock-fall Hazard Line	Sierra Sweet Bay Vegetation	Scenic Segment	
Inferred Rock-fall Hazard Line	Surfaced Area		



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# ALTERNATIVE 1: NO ACTION



## MERCED LAKE HIGH SIERRA CAMP

1. Merced Lake Shore Meadow: Informal trails would continue to exist in Merced Lake Shore Meadow, adjacent to the Merced Lake High Sierra Camp.
2. Merced Lake High Sierra Camp and Merced Lake Backpackers Camping Area
  - Merced Lake Backpackers Camping Area: Infrastructure at the camping area would include a water system with flush toilets and bear boxes for food storage.
  - Merced Lake High Sierra Camp: The High Sierra Camp would continue to have 22 lodging units (60 beds) and a water system with flush toilets.
3. Merced Lake Ranger Station Meadow: The meadow would continue to have high levels of bare ground associated with administrative pack stock grazing.
4. Special-Status Plants: Trails through sensitive habitats would continue to impact fragile plant species in several places in the river corridor.

## OTHER SEGMENT 1 CAMPING AREAS

- Little Yosemite Valley Camping Area: Infrastructure at the camping area includes a composting toilet and bear boxes for food storage. This would remain a designated camping area for the Little Yosemite Valley Wilderness Zone.
- Moraine Dome Camping Area: This area would remain as a designated camping area for the Little Yosemite Valley Wilderness Zone.



## WAWONA

1. Wawona Campground and South Fork Picnic Area
  - Wawona Campground would contain 97 campsites (96 individual sites and 1 group site) and would continue to be served by septic tanks and leach fields.
  - The South Fork Wawona picnic area would continue to be undelineated and have no designated river access.
2. Wawona Store Area
  - Roadside parking on Wawona Road would continue to create vehicle/pedestrian conflicts and associated traffic congestion.
  - The Wawona Store parking facility would not accommodate parking demand.
  - The restrooms, existing numbers of picnic tables, and parking spaces would continue to serve visitors in their present condition and configuration. There would be no formal river access point from the picnic area to the river.
3. Wawona Stables: The concessioner would continue to provide day rides originating from the Wawona Stables.
4. Wawona Hotel Complex
  - The hotel would continue to have 104 lodging units, providing overnight guests with a swimming pool and tennis courts.
  - A nine-hole golf course, associated with the hotel with retail and food service, would remain in service. The golf course would continue to serve as a spray field for the water reclaimed by the Wawona wastewater treatment plant.
5. Recreational Vehicle Facilities: The RV dump site in Wawona would continue to be located in close proximity to the river.
6. NPS Maintenance Area
  - Maintenance Yard: The maintenance facility would continue to exist in its current location, condition and configuration.
  - Wawona Stock Camp: The stock camp has two sites and would continue to be located in a sensitive resource area.

Cultural Resources: Ground disturbing activities, potential loss to shallow deposits of historic artifacts and features, abandoned infrastructure, informal trails and visitor use affect culturally sensitive areas.

Legend			
Parking Area	Informal Trail	Designated Wilderness	Stream
Campground	Valley Loop Trail	Archeological District	Merced River (Rafting Prohibited)
Ranger Station	Bike Path	Housing	Merced River (Rafting Permitted)
Picnic Area	Boardwalk	Management Activities & Services	
Trailhead	Trail	Visitor Based Activities & Services	
100 ft. Contour	100-year Floodplain	Recreational Segment	
Revetment	Meadow & Riparian Vegetation	Wild Segment	
Calculated Rock-fall Hazard Line	Sierra Sweet Bay Vegetation	Scenic Segment	
Inferred Rock-fall Hazard Line	Surfaced Area		

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## Detailed Description of Alternative 1 (No Action)

The following section describes the existing issues affecting river values in the Merced River corridor that would continue under Alternative 1 for the purposes of providing a baseline for comparison with the action alternatives (Alternatives 2-6). The intent is to identify where additional management is needed to address these issues, as described in Chapter 5. This section also describes the existing condition user capacity, land use, and facilities management in the Merced River corridor. All of the descriptions are organized by river segment.

### *Segment 1- Wilderness above Nevada Fall (Wild Segment)*

#### **Current Conditions: Issues Affecting River Values**

##### *Biological Values*

- Administrative pack stock grazing – Merced Lake Ranger Station Meadow would continue to reflect high levels of bare ground and trampling associated with high levels of administrative pack stock grazing.
- Meadow trails – There would be few or no mitigations for informal trails, trails in wet and/or sensitive vegetation, and trails that fragment meadow habitat, including meadow trails in the Triple Peak Fork, wetlands near Echo Valley and Merced Lake shore, and the mineral springs between Merced Lake and Washburn Lake.

##### *Scenic Values*

The Merced Lake High Sierra Camp would remain, affecting scenic views in the Merced Lake area.

##### *Recreational Values*

The wilderness experience would continue to be affected by high levels of visitor use along trails, at the Merced Lake High Sierra Camp, and at designated camping areas.

#### **Current Condition: User Capacity, Land Use and Facilities Management**

This alternative would accommodate the same kinds and amounts of use that exist today in this segment. The kinds of use would continue to focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude.

##### *Visitor Activities and Services*

Primary activities in this segment would continue to include hiking and overnight backpacking.

- Merced Lake Backpackers Camping Area and the associated infrastructure, such as flush toilets, water system, and bear boxes, would remain.
- Merced Lake High Sierra Camp would continue to have a 60-bed capacity, offer the same level of services, and all associated infrastructure would remain.
- Designated camping areas would continue to include Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Area.
- Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area.

### *Visitor Overnight Capacity*

The Merced Lake High Sierra Camp would remain at its current capacity of 22 units (60 people per night). For dispersed camping, including those staying in the designated areas mentioned above, the wilderness zone capacities would remain unchanged as follows in Table 8-6:

**TABLE 8-6: WILDERNESS ZONE CAPACITIES – ALTERNATIVE 1 (NO ACTION)**

Wilderness Zones	Alt 1 No Action Zonewide Capacity	Alt 1 No Action Zone Capacity in River Corridor
Little Yosemite Valley Zone	<b>150</b> people	<b>150</b> people
Merced Lake Zone	<b>50</b>	<b>50</b>
Washburn Lake Zone	<b>150</b>	<b>100</b>
Mount Lyell Zone	<b>50</b>	<b>10</b>
Clark Range Zone	<b>50</b>	<b>10</b>

### *Visitor Day Use Capacity*

Day use generally occurs along the trail between the top of Nevada Fall and Little Yosemite Valley. This use is primarily associated with hikers going to Half Dome, outside of the river corridor. This specific activity is managed through a permit system. As this is a wilderness area, the only access to this segment is by way of hiking trails. Day-use parking for the trailheads that access this segment is included in the calculations for Yosemite Valley (see Segment 2 below).

### *Administrative Activities*

Administrative uses in Segment 1 consist primarily of regular ranger patrols and backcountry utility work as well as occasional trail/restoration crews. These activities are seasonal and minimal in comparison to visitor use and would not affect the overall user capacity.

### *Employee Housing Capacity*

The Merced Lake ranger station and the Little Yosemite Valley trail crew and ranger camp would remain as temporary housing for employees working in this area. Rangers are stationed in Segment 1 for 4-8 days at a time. At any one point in time, between 6-10 NPS employees are stationed at Little Yosemite Valley ranger camp and 0-4 Merced Lake ranger station. On occasion trail crews of 5-15 people will pass through these areas may stay for 1-4 weeks at a time. There is no permanent housing in this segment.

### *Employee and Administrative Parking Capacity*

Employee and administrative parking for this segment is located in Yosemite Valley and therefore is accounted for in the Segment 2 employee and administrative parking capacities.

### *Transit Options*

Similar to parking, the only access to this wild segment is via hiking trails and the trailheads that provide access to this segment are located in Yosemite Valley (Segment 2). Thus, visitors who wish to recreate in this segment would use the transportation options to the Valley to access these trailheads. (Specific transportation options for reaching Segment 1 trailheads are listed below under Segment 2).

## Segment 2- Yosemite Valley (Recreational and Scenic Segments)

### Current Condition: Issues Affecting River Values

#### *Free-Flowing Condition*

- **Riverbank riprap** – The approximately 15,589 feet of riprap along the bed and banks of the Merced River within the park would remain.
- **Bridges** – All bridges and elevated roadways would remain in place without mitigations to address bridge-related impacts on free-flowing condition; this includes footings within the bed and banks of the Merced River, which serve as an impediment to hydrologic flows.
- **Abutments and abandoned infrastructure** – The abutments and infrastructure associated with the former bridge at Happy Isles and the gauge base would remain in their current location and condition. The infrastructure associated with the Pohono Bridge gauging station would remain inside the bed and banks of the river.

#### *Water Quality*

- **Pack Stock trail** – The pack stock trail, north of the river, between Clark's Bridge and the Concessioner Stables, would remain within the ordinary high-water mark; the area would continue to be subject to seasonal flooding, accelerated erosion, and sediment deposition in the river.
- **Upper Pines (RV) Dump Station** – The Upper Pines RV dump station would remain in close proximity to the river.
- **Yosemite Valley Day-use Parking Area (Camp 6)** – This unimproved parking area would remain without appropriate mitigations for water quality protection. It would continue to be located within the 5-10-yr floodplain, on former meadow, in the potential channel migration zone. Fill would remain in sensitive areas of this parking area.

#### *Biological Values*

As described above under "Overview", some ecological restoration could occur under Alternative 1 (No Action); however most of the management concerns identified in Chapter 5 regarding meadow fragmentation in several Yosemite Valley meadows and localized impacts on riparian habitat along the river would not be addressed in this alternative. Specifically:

- All existing development adjacent to the bed and banks of the river would remain, including camping, lodging facilities, and parking.
- **Ditching** – Human-constructed ditches would remain in meadows throughout Yosemite Valley.
- **General meadow hydrology** – Conifers would continue to encroach into Yosemite Valley meadows. While the NPS would continue the mechanical removal of conifers to reduce fuel loads under the park's *Fire Management Plan*, no additional action would be taken to mitigate conifer encroachment. Formal and informal trails, abandoned roadbeds, and informal roadside parking would remain in meadows and wetlands in Ahwahnee Meadow, El Capitan Meadow, Cook's Meadow, Leidig Meadow, and Sentinel Meadow. Roads and bike paths would continue to bisect Ahwahnee Meadow, Stoneman Meadow, Leidig Meadow, and Sentinel Meadow. Curry Village orchard parking area would remain in what was formerly part of Stoneman Meadow.
- **Former Pine and Oak Yosemite Lodge units** – There is no development in the site of the former Pine and Oak cabins at Yosemite Lodge. However, fill and impacts from soil compaction from

removal of the former Yosemite Lodge units and cabins after the 1997 flood would remain. A network of roads remains that once facilitated access to these lodging units would remain.

- **Abandoned Infrastructure**– Abandoned infrastructure would remain in Eagle Creek Meadow, Royal Arches Meadow, Cook’s Meadow, the western (closed) portion of former Lower Pines Campground and the former lodge cabin/volunteer center at Yosemite Lodge.
- **Valley Loop Trail** – The Valley Loop Trail would continue to pass through sensitive and sometimes inundated meadow habitat in Slaughterhouse Meadow and Bridalveil Meadow.
- **Ahwahnee Meadow** – The Ahwahnee Meadow topography would continue to be modified by ditching; fill material found in the former golf course; a former roadbed in the southwest corner of the meadow; and large conifers that have become established along the former roadbed. Additionally, the tennis court would remain in a black oak community.
- **Bridalveil Meadow** – A head-cut from former ditch would remain adjacent to Bridalveil Meadow.
- **Former Upper and Lower River Campgrounds** - Graded landscape, filled drainages, compacted soils, existing (amphitheater), abandoned infrastructure, and invasive plant infestations would remain.
- **El Capitan Meadow**- Soil compaction and trampled vegetation resulting from informal trails and easy access to the meadow from roadside parking would continue. The NPS would continue to remove invasive non-native plants following the *Invasive Plant Management Plan*.
- **Foot traffic** – Heavy foot traffic associated with campgrounds, lodging, rafting operations, and picnic areas would continue to denude riparian vegetation. High levels of visitor use would remain near the river at Valley Campgrounds, El Capitan Bridge, Swinging Bridge, and Sentinel Beach Picnic Areas.
- **Housekeeping Camp** – Several Housekeeping Camp units would remain located in the 2-10 year floodplain.
- **Yosemite Lodge** – Several buildings would remain in the 100-year floodplain.
- **Pohono Bridge to Diversion Dam** – There would continue to be no designated river access points in this reach; as a result, soil erosion and loss of vegetation would continue as well as unsafe parking practices resulting from improper roadside parking.

### *Geologic/Hydrologic Values*

- **River Reach Upstream of El Capitan Moraine** – The NPS would take no action to enhance the riparian habitat and improve channel complexity in the river reach upstream of El Capitan moraine to the picnic area at Sentinel Beach.
- **Eagle Creek Drainage** – No action would be taken to remove the berm or repair the channelization near Northside Drive.
- **River channel** – The NPS would take no action to mitigate river widening and low channel complexity between Clark’s Bridge and Sentinel Bridge.

### *Cultural Values*

- **Traditionally used plant populations** – Traditionally used plant populations would continue to be managed by actions prescribed in the park’s invasive plant management program. Conifers and abandoned infrastructure would remain in black oak habitat.
- **Archeological sites** – Informal and formal trails, various types of visitor use, parking, and graffiti would continue to impact archeological sites in Yosemite Valley.



- **Residence 1 (Superintendent's House)** – This historic structure would remain subject to recurring flooding and subsequent water damage. The historic interior finishes, especially the distinctive plaster work, would remain in poor condition. Structural issues related to settling of the foundation have resulted in displacement of walls and floors would not be addressed. In addition, informal trailing that impact Cook's Meadow would not be addressed.
- **Historic resources** – Alternative 1 would maintain all the collective sites representing the prominent historic patterns of development in Yosemite Valley in their current locations and in their current status. Those resources that are in conflict with other ORVs (e.g., Sugar Pine Bridge) and in poor or fair condition (e.g., Residence 1 and LeConte Memorial Lodge) would remain as such.

### ***Scenic Values***

The following visual intrusions into the natural scenery in Yosemite Valley would remain:

- Human-made structures in Yosemite Valley (including roads and traffic through meadows and the presence of certain visitor and administrative facilities in the river corridor),
- Vegetation growth that has intruded on scenic viewpoints historically available to park visitors, and
- Riverbank erosion, informal trails, and riparian vegetation that affect direct and foreground views of the river, river-dependent resources, and the peaks and walls rising above the river.

### ***Recreational Values***

The following recreational values would continue:

- **Recreational Activity Participation**- All current recreational activities would continue in the No Action Alternative, including site seeing, scenic driving, day hiking, wildlife viewing, picnicking, floating, creative arts, camping, bicycling, nature study, rock climbing and engaging in ranger lead programs.
- **Recreational Setting Attributes**- The Merced River would continue to serve as a focal point for recreation in Yosemite Valley. Existing conditions of natural and cultural conditions will also negatively impact the recreational values by diminishing the quality of settings for visitors to enjoy.
- **Recreational Experience Quality**- Visitors in both park surveys and other studies report feeling crowded by other visitors in Yosemite Valley during peak periods, especially in parking areas that provide access to the river and other major visitor destinations. However, visitors still report a relatively high level of visitor satisfaction.

## **Current Condition: User Capacity, Land Use and Facilities Management**

Alternative 1 (No Action) would accommodate the same kinds and amounts of use that exist today.

### ***Visitor Activities and Services***

Under the No Action Alternative, recreational activities would remain as they are today. Yosemite Valley would provide for a diversity of river-related and other recreational opportunities.

Activities:

- **Interpretation** – There would continue to be limited interpretive nature walks that educate the public on natural river processes and stewardship of river-related resources.

- *Way finding* – Inadequate way finding and unclear pedestrian circulation would remain at Happy Isles.
- *Boating*- Commercial and private boating is currently allowed on a 2.4 mile reach of the Merced River between Stoneman Bridge and Sentinel Picnic Area. Peak use levels of the open boating reach in Yosemite Valley is most commonly between 150-250 boats per day, but can be as high as 300 boats per day. About two-thirds of this use is from commercial rafts.

Services:

- *Curry Village Services*: The configuration and level of services and facilities in Curry Village would remain unchanged. The Concessioner Stables would continue to be used by the concessioner to house the stock animals used for and day rides and to operate the High Sierra Camp. The herd has decreased in size since this facility was constructed, but the facility footprint remains the same. A kennel service would also continue to be operated out of the stables.
- *Housekeeping Camp*: Visitor use facilities at Housekeeping Camp would continue to include shower houses and restrooms, laundry and a grocery store.
- The configuration and level of services and facilities in *Yosemite Village* would remain unchanged, including facilities such as the Concessioner General Office, Concessioner Garage, and the Bank Building. Inadequate visitor way-finding at Yosemite Village Day-use Parking Area (Camp 6) would persist.
- *Bridalveil Fall*: The existing design of the pedestrian circulation system at this popular attraction site does not accommodate the level of visitor use it receives. A network of social trails exists. Neither the pedestrian walkways nor the restrooms meet current accessibility standards.
- *El Capitan Meadow*: The shuttle stop at El Capitan is not a formal, appropriately designed stop.

**Visitor Overnight Capacity**

Overnight capacities would remain the same. Reservation systems for both lodging and camping would continue.

Campgrounds would maintain a total of 466 sites accommodating up to 2,892 people per night.

- *Backpackers Campground* – 25 campsites including 2 administrative sites would remain in close proximity to the river.
- *Former Upper River Campground* – The former campground area would continue to passively ecologically restore to natural conditions. Material such as asphalt and fill material would remain.
- *Former Lower River Campground*: The former campground area would continue to passively ecologically restore to natural conditions. Material such as asphalt and fill material would remain.
- *Lower Pines* – 76 campsites would be retained (16 sites are for administrative use; 18 sites are RV-only).
- *North Pines* – 86 campsites would be retained (5 sites are for administrative use; 23 sites are RV-only).
- *Upper Pines* – 240 campsites would be retained (2 are for administrative use; 44 sites are RV only sites)
- *Camp 4* – The current configuration and number of campsites would remain at Camp 4.

Lodging would remain at a total capacity of 1,034 units, accommodating up to 3,672 people per night.

- *The Ahwahnee*: Services and facilities that include bar and food service, dining room, gift shop, sweet shop, pool, and tennis courts would be retained.
- There are 400 lodging units at *Curry Village* that can be included Alternative 1 (No Action) per the 2009 Settlement Agreement; 103 additional temporary guest lodging units currently in the Boys Town area are not considered part of this alternative.
- The *Curry Orchard Parking* area would continue to have approximately 424 parking spaces that are not formalized with best management practices.
- All 266 units at *Housekeeping Camp* lodging units would be retained, and would remain within the 100-year floodplain.
- *Yosemite Lodge* services and facilities would be retained in current configuration and at current level of service, and would continue to be used for overnight lodging, parking and food service.

### ***Visitor Day Use Capacity***

In this alternative, no changes would be made to available parking capacity in Yosemite Valley (2,337 spaces accommodating up to 7,260 people at one time).

Parking and traffic circulation at The Ahwahnee would continue to be inadequate to meet overnight and day-use demand.

The Wilderness Parking Area was not designed as a formal parking area and would continue to be undelineated and undersized for demand. Soils in this location, which once served as a landfill for Curry Village, would not be remediated.

**Yosemite Village Day-use Parking Area (Camp 6/Village Store):** There is currently a four-way intersection at the exit of the parking area near Northside and Sentinel Drives. People cross at this intersection to get to and from visitor services from the parking area. Informal shoulder parking overflow from the day-use parking area is encroaching on sensitive habitat in this location. This parking area is an approximately 6 acre dirt lot, currently being used to park approximately 517 vehicles on peak days using directed parking. There are 237 Yosemite Village parking spaces.

**Yosemite Lodge:** Demand for day-use parking would continue to exceed supply during summer peak-use periods. There would continue to be no parking at Highland Court, due to the placement of temporary housing in the parking lot after the 1997 flood. The west portion of the Yosemite Lodge parking area would continue to be used for overflow parking for tour buses and transit buses, day use and overnight use.

**Camp 4:** The Camp 4 Parking Lot would continue to be inadequately sized for current levels of overnight and trailhead parking. There would continue to be a total of 89 parking spaces in the main Camp 4 Parking Lot, 29 overnight vehicles and 33 day use vehicles in the overflow parking across Northside Drive.

### ***Administrative Activities***

Administrative uses are well-established in this segment. Both NPS administrative offices and concessioner offices are located in the Valley along with NPS and concession employee housing.

### ***Employee Housing Capacity***

All employee housing would remain in this segment under this alternative. This would include 1,151 beds for concessioner employees and 71 units (164 beds) for NPS employees. There would continue to be temporary housing at Huff House. Temporary housing would continue to occupy the Lost Arrow parking

lot. The Tecoya Dorms, Ahwahnee Row Housing, and associated parking would remain within the 100-year floodplain, with no development setback from Indian Creek. There would continue to be employee housing in the Yosemite Lodge area at Highland Court and the Thousands Cabins. Yellow Pine Administrative Campground would continue to only be available for administrative use (4 group sites for up to 120 people.)

### *Employee and Administrative Parking Capacity*

Parking for administrative functions would be located within the land assignments for these uses, and would not compete with visitor parking.

### *Transit Options*

Regional bus service into Yosemite Valley is shown in Table 8-7. A maximum of 270 people at one time could arrive to the Valley on regional transit.

Commercial tour buses are allowed to park in 15 parking spaces allocated for that use near the Yosemite Lodge. With all seats filled on these buses, a maximum of about 720 people could arrive to Yosemite Valley on commercial tour buses. All regional transit runs are done with 48 passenger buses.

**TABLE 8-7: TRANSIT OPTIONS- ALTERNATIVE 1 (NO ACTION)**

9. Regional Transit Options	
HWY 140 Merced/Mariposa to Yosemite Valley	8 runs / day (4 from Merced; 4 from Mariposa) (year round)
HWY 41 Fresno/Oakhurst to Yosemite Valley	No Service
HWY 120 West Groveland/Sonora to Yosemite Valley	1 weekday run- Sonora to Valley 2 weekend runs- Groveland to Valley (summer only)
HWY 120 East Inyo/Mono County (Mammoth Lakes) to Yosemite Valley	1 run per day (summer only)
10. Yosemite Valley Shuttle Options	
East Yosemite Valley	7 minute peak interval between buses Year round except Visitor Center direct
Visitor Center Express Yosemite Valley Day-use Parking Area to Visitor Center	15 min. interval between buses (summer only)
El Capitan Crossover	30 min. interval between buses (summer only)
West Yosemite Valley	No service

### ***Segment 3 – Merced Gorge (Scenic Segment)***

#### **Current Conditions: Issues Affecting River Values**

##### ***Scenic Values***

Views from the river and roads in Segment 3 continue to have high aesthetic value. Pullouts and roadside interpretive displays would be maintained.

#### **Current Conditions: User Capacity, Land Use and Facilities Management**

##### ***Visitor Activities and Services***

The kinds of use that are currently provided in this segment would continue. The primary activity would remain scenic driving along Highway 140 for travelers to other park destinations. However, several pull-outs provide parking and access to the river and other parts of the corridor along this segment.

- River related recreational activities would continue to include swimming, fishing, and climbing. These activities occur in summer when the river is low and the air and water temperatures are warm.
- Kayaking/boating would not be allowed in this segment under this alternative due to the safety concerns associated with accessing the river for search and rescue operations during high use periods. This section of river is steep and rocky, and boatable only by the most advanced paddlers.

##### ***Visitor Overnight Capacity***

There are no overnight accommodations in this segment.

##### ***Visitor Day-use Parking Capacity***

The day-use parking capacity in this segment would remain at 180 spaces.

##### ***Administrative Activities***

Administrative use in this segment would continue to be focused on the Arch Rock Entrance Station and the thru-traffic accessing Yosemite Valley and other park destinations.

##### ***Employee Housing Capacity***

The residential unit at the Arch Rock Area would continue to house up to 9 NPS employees.

##### ***Employee and Administrative Parking Capacity***

Minimal designated parking would be available for administrative use at the Arch Rock Entrance station. This parking is signed for employees only; employees do not compete with visitors for parking and access.

##### ***Transit Options***

Public transit options along this segment would be expanded as described in the Yosemite Valley segment (see Segment 2 above).

## ***Segment 4- El Portal (Scenic Segment)***

### **Current Conditions: Issues Affecting River Values**

#### ***Free-Flowing Condition***

- **Abandoned infrastructure**– Abandoned infrastructure and imported fill at Cascades Picnic Area, Abbeville, and Trailer Village would remain.
- **River channel** – The Merced River in El Portal would continue to be confined by riprap and Highway 140. Standards for revetment repair would not be developed in partnership with CalTrans.
- **Greenemeyer sand pit** – Greenemeyer sandpit would continue to contain fill material that precludes natural flooding and regeneration of riparian plant communities.

#### ***Water Quality***

- **NPS Maintenance and Administrative Complex**– The off-street and roadside parking areas would be continue to be located between the Merced River and Foresta Road. These areas were not designed or built to prevent water quality contamination from automotive fluids, surface water runoff or sediment transport.

#### ***Cultural Values***

- **Archeological sites** - Abandoned infrastructure located on site number CA-MRP-0181/H would continue to impact an area that is highly valued by traditionally associated American Indians. In addition, informal trails, non-essential gravel roads, and visitor use that contribute to archeological site disturbances at CA-MRP-0250/H and CA-MRP-0251/H in Old El Portal would remain.

### **Current Conditions: User Capacity, Land Use and Facilities Management**

#### ***Visitor Activities and Services***

Most recreational activities that take place in this segment are oriented toward the local community, while the vast majority of park visitors pass through en-route to Yosemite Valley and other park destinations. However, a small number of park visitors would continue to visit the Merced River in the El Portal segment as a destination, and not continue into Yosemite. Primary river recreation activities including swimming, fishing and boating would continue.

#### ***Visitor Overnight Capacity***

There are no NPS overnight accommodations for the public in El Portal. An expansive lodging complex is located on private land near the park boundary, outside of NPS jurisdiction.

#### ***Visitor Day-use Parking Capacity***

The current amount of visitor day-use parking (214 spaces) would be retained, consisting primarily of parking at the Store and Gas Station and along the roadsides.

### ***Administrative Activities***

The El Portal Administrative Site within this segment was established to accommodate administrative use in support of Yosemite National Park. These well-established administrative uses would remain under Alternative 1.

### ***Employee Housing Capacity***

Employee housing is currently made up of 126 units that house 192 employees in this segment.

### ***Employee and Administrative Parking Capacity***

Parking for administrative functions would be located within the land assignments for these uses and would not compete with visitor parking. NPS would maintain the 610 parking spaces for administrative uses and the 106 residential spaces.

### ***Transit Options***

As in the Yosemite Valley and Merced Gorge segments along Highway 140, public transit along this travel corridor would be maintained. For a complete summary of the transit option along this corridor, see the Segment 2 summary of Transit Options above.

## ***Segment 5- South Fork Merced River above Wawona (Wild Segment)***

### **Current Conditions: Issues Affecting River Values**

#### ***Cultural Values***

Informal trails and visitor use would continue to impact rock ring features and related archeological resources in this segment.

### **User Capacity, Land Use and Facilities Management**

Use in Segment 5 would remain very low and river values would remain protected under Alternative 1.

#### ***Visitor Activities and Services***

Recreational activities in this segment remain limited to occasional overnight backpacking and day hiking. The kinds of recreational activities would remain the same in Alternative 1.

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. This use would not be regulated under Alternative 1.

#### ***Visitor Overnight Capacity***

Very little overnight use occurs in Segment 5. No changes to wilderness zone capacities are proposed in Alternative 1.

### ***Visitor Day-use Parking Capacity***

As this is in Wilderness, the only immediate access to this segment is via hiking trails. Day-use parking for the trailheads that lead to this segment is included in the Wawona area (see Segment 7 below) or by way of USFS trails that via Quartz Mountain and Chiquito Pass. Otherwise, very little day use occurs along this segment.

### ***Administrative Activities***

Administrative uses are inconsequential in this segment and no changes are proposed.

### ***Employee Housing Capacity***

There is no employee housing in this segment.

### ***Employee and Administrative Parking Capacity***

There is no employee parking in this segment.

### ***Transit Options***

Similar to parking, the only access to this wild segment is via hiking trails and the trailheads that provide access to this area are located in Wawona (Segment 7) or by way of U.S. Forest Service trails. Visitors who wish to recreate in this segment would use the transportation options to Wawona to access these trailheads. (Specific transportation options for reaching Segment 5 trailheads are listed below under Segment 7).

## ***Segment 6 and 7- Wawona and Wawona Impoundment (Recreational Segments)***

### **Current Conditions: Issues Affecting River Values**

#### ***Free-Flowing Condition***

- **Wawona impoundment** – The current water collection and distribution system would be retained. The water conservation plan relating to the minimum flow analysis for the South Fork would continue to be implemented.
- **Abandoned infrastructure** – Abandoned metal pipes in side channels on the South Fork Merced River would remain, dewatering the terrace.

#### ***Water Quality***

- **Water withdrawals** – Surface water withdrawals from the South Fork of the Merced River in Wawona would continue and when drought reduces river flows to less than 6 cubic feet per second. The NPS would continue to limit withdrawals to 10% or less of the river's actual flow, implementing water conservation measures as needed to provide adequate water service to the community.
- **Waste water collection system for the Wawona Campground** – Wawona Campground would be served by septic tanks and leach fields. When the capacity is exceeded, there would continue to be a potential for effluent to migrate into ground water and the river.
- **Wawona recreational vehicle (RV) dump station** – The Wawona RV dump station would remain very close to the banks of the river.



- **Wawona Store Picnic Area**– The Wawona Store Picnic Area near Pioneer History Center would continue to receive visitor use levels during peak periods that exceed the design of the existing infrastructure. There would be no formal river access point here on this steep riverbank.
- **South Fork Wawona Picnic Area** - The South Fork Wawona Picnic Area is not delineated and has no formal river access point. Visitors would continue to access the river by creating informal trails.

### ***Cultural Values***

- **Archeological Sites** - Informal trails and visitor use would continue to cause ground disturbing impacts to surface and sub-surface archeological resources.

## **Current Conditions: User Capacity, Land Use and Facilities Management**

Overall, Alternative 1 would provide for the same kinds and amounts of use that presently exist in the Wawona area. Segment 6 includes the Wawona impoundment and no use is allowed in this area due to water quality and safety concerns. Therefore, the summary of user capacity provided below pertains only to Segment 7.

### ***Visitor Activities and Services***

A range of visitor recreation activities would continue to be available. River related activities would include swimming, fishing and boating.

- Swimming opportunities would continue to be popular at the Swinging Bridge area.
- Fishing regulations would continue.
- Private boating would continue to be allowed, excluding the Wawona impoundment.

Other non-river related recreational activities in this segment include picnicking, camping, lodging, education and interpretation at the History Museum, special events at the Wawona Hotel, and golfing. Each of these activities would continue under this alternative.

- Picnicking would continue at the Wawona Store area and the South Fork picnic area. No improvements to these facilities would occur, other than routine maintenance. No designated river access would be provided.

### ***Visitor Overnight Capacity***

The overnight capacity of the Wawona Hotel would remain the same at 104 rooms accommodating a maximum of 247 people per night.

The Wawona Campground capacity would remain the same at 96 individual sites and 1 group site. The 2 stock-use campsites would also remain, bringing the total capacity of camping to a maximum of 618 people per night.

### ***Visitor Day-use Parking Capacity***

Day-use parking capacity would remain at 290 spaces, as in the other action alternatives.

### ***Administrative Activities***

NPS Administrative uses are well-established in this segment would continue. Both NPS administrative offices and visitor services offices remain located in their current locations.

### ***Employee Housing Capacity***

There are 79 employee housing units in this river segment. No changes are proposed to employee housing in this segment.

There would continue to be a total of 118 concessioner employees in Wawona under Alternative 1. The majority of these employees would live in the Wawona community or elsewhere outside the river corridor.

### ***Employee and Administrative Parking Capacity***

Parking for administrative functions would be located within the land assignments for these uses and would not compete with visitor parking.

### ***Transit Options***

Transit options would remain unchanged in Alternative 1. The Wawona area shuttle would continue, serving the key destinations within this segment along with the Mariposa Grove of Giant Sequoias. The daily concession operated shuttle between Wawona and Yosemite Valley would also continue.

## ***Segment 8- South Fork Merced below Wawona (Wild Segment)***

### **Current Conditions: Issues Affecting River Values**

There are no issues or actions related to river values in this segment.

### **Current Conditions: User Capacity, Land Use and Facilities Management**

#### ***Visitor Activities and Services***

Most recreational use in this segment consists of day visitors swimming or hiking. Additionally, some rafters may put in below the Wawona campground, attempting the Class 5 multi-day adventure down the South Fork through the Sierra National Forest to the junction with the Main Stem Merced. However, this section of river is very short within the National Park, and very few people attempt this trip given the high skill level required. These activities would continue under this alternative.

#### ***Visitor Overnight Capacity***

No overnight use is proposed for this segment.

#### ***Visitor Day-use Parking Capacity***

The only immediate access to this segment is via hiking trails. Day-use parking is included in the Wawona area (see Segment 7 below). Otherwise, very little day use occurs along this segment.

#### ***Administrative Activities***

Little or no administrative use occurs along this segment and no changes are proposed.

### ***Employee Housing Capacity***

There is no employee housing in this segment.

***Employee and Administrative Parking Capacity***

There is no employee or administrative parking in this segment.

***Transit Options***

Transit services for access to this segment are described above under Segment 7.

***Necessity of Major Public-use Facilities and Services***

Under this alternative all of the facilities and services evaluated in Chapter 7 would remain. A determination as to their necessity in accordance with the WSRA mandate is not required.

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- |   |                                  |
|---|----------------------------------|
| 1 Curry Village Residential Area        | 7 Curry Pavilion (food services) |
| 2 Huff House Temporary Employee Housing | 8 Stoneman Meadow                |
| 3 Historic cabins (guest lodging)       | 9 Curry Orchard Parking Area     |
| 4 Curry Village Ice Rink                | 10 Campground Reservation Center |
| 5 Bicycle rental and raft rental stands | 11 Tents (guest lodging)         |
| 6 Stoneman Cottage                      | 12 Boys Town guest lodging       |

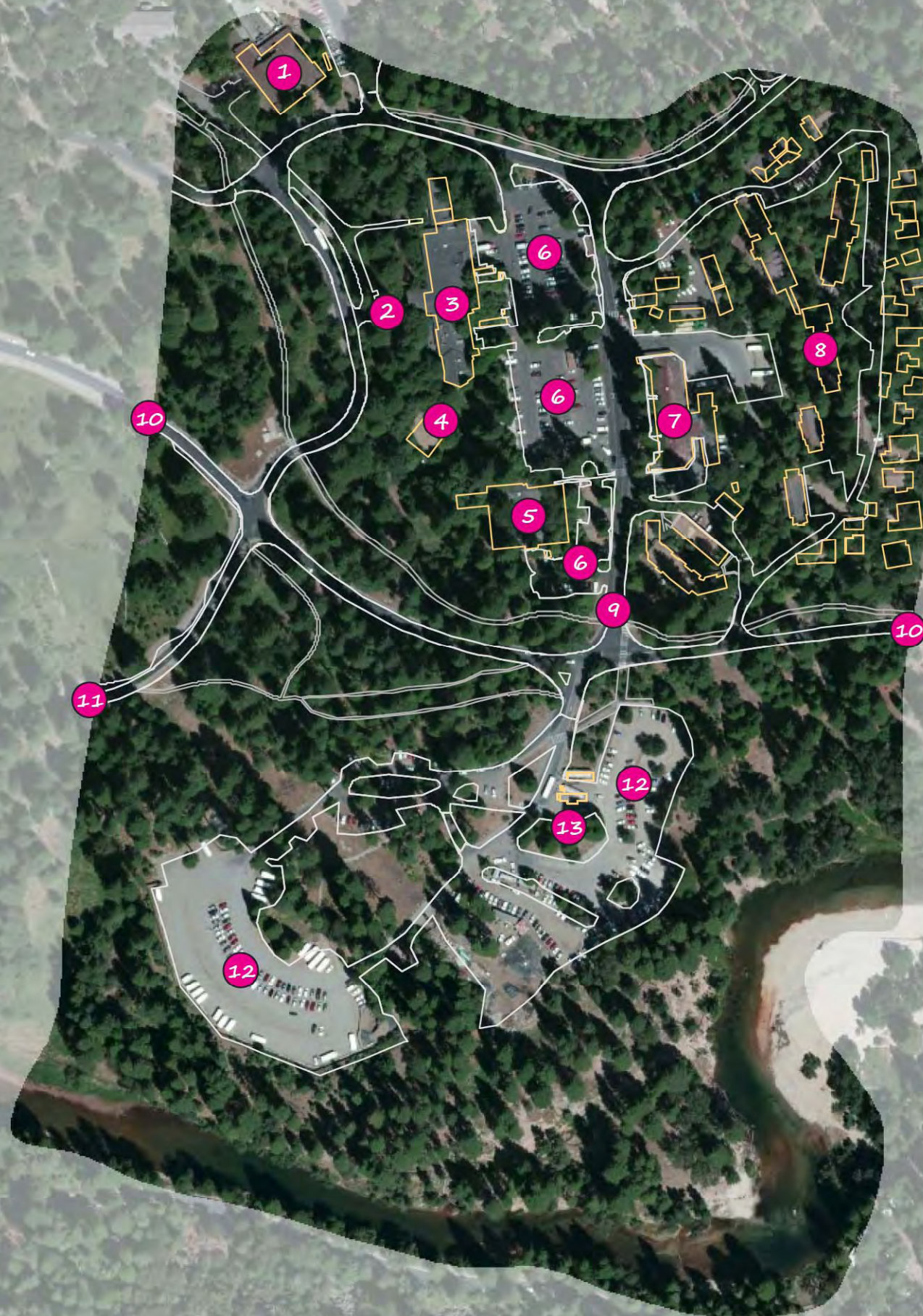
**Alternative 1: No Action**  
**Curry Village**  
Yosemite National Park  
United States Department of the Interior • National Park Service



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- 1 Food service
- 2 Village Mall
- 3 Village Store
- 4 Art Activity Center (former bank building)
- 5 Concessioner General Office
- 6 Parking area
- 7 Concessioner Garage
- 8 Employee housing area
- 9 Village Drive
- 10 Northside Drive
- 11 Sentinel Drive
- 12 Yosemite Village Day-use parking area (Camp 6)
- 13 Temporary restrooms and visitor contact station



**Alternative 1: No Action**  
**Yosemite Village Day-use Parking Area**  
Yosemite National Park  
United States Department of the Interior • National Park Service



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- 
- 1 Yosemite Lodge driveway and parking areas
- 2 Guest lodging
- 3 Thousands Cabins employee housing
- 4 Swimming pool, snack and bicycle rental stands, and post office
- 5 Food service and retail stores
- 6 Lodge registration
- 7 Highland Court temporary employee housing
- 8 Linen storage and laundry
- 9 NPS volunteer office
- 10 Former Yosemite Lodge Annex (disturbed area)
- 11 Camp 4 walk-in campground
- 12 Former service station site
- 13 Camp 4 parking facility



**Alternative 1: No Action**  
**Yosemite Lodge and Camp 4**  
Yosemite National Park

United States Department of the Interior • National Park Service



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- 1 Open storage areas
- 2 NPS stables and corral
- 3 Covered storage structures
- 4 Search and Rescue operations
- 5 Fueling station
- 6 Government Utility Building
- 7 Service bay access
- 8 Utility buildings
- 9 Former construction management office (removed)
- 10 Concessioner Maintenance and Warehouse Building



**Alternative 1: No Action**  
**Yosemite Valley Maintenance Area**  
Yosemite National Park  
United States Department of the Interior • National Park Service



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## ACTIONS COMMON TO ALTERNATIVES 2-6

The *Merced River Plan/DEIS* would address many management concerns or considerations in the same way, regardless of the alternative selected. This section groups these common actions to avoid redundancy under each alternative. These actions do not constitute an independent alternative, but rather, are an integral part of Alternatives 2-6. These common actions are the heart of the *Merced River Plan*: they address how river values would be protected, regardless of how the visitor experience might vary across Alternatives 2-6 and how related services and facilities might vary.

In addition to the actions listed in this section, each alternative would incorporate the boundaries, classifications, and Section 7 determination process outlined in Chapters 3 and 4. The mitigation measures described in Table 2-2 and the Mitigation Measures described in Appendix C would also be common to Alternatives 2-6.

### Actions to Protect and Enhance River Values

The protection and enhancement of river values that would be common to Alternatives 2-6 is described in greater detail in Chapter 5, “River Values and Their Management.” That chapter (1) states the management standards for each value, (2) analyzes the current condition of each value and the management concerns or considerations related to achieving and maintaining the management standards, and (3) identifies the actions that would be required to protect and enhance each value. The actions to protect and enhance the river’s geologic, hydrologic, and biological values are described in detail in the Ecological Restoration Plan included in Appendix E.

Many of the actions included in the Ecological Restoration Plan would protect or enhance multiple river values; for example, removal of road shoulder parking would improve natural water flows into meadows and discourage informal foot trails through meadows, protecting and/or enhancing hydrologic, biological, cultural, and scenic values.

Table 8-8 and the maps that follow highlight major actions for protecting and enhancing river values that are common to all the action alternatives.

**TABLE 8-8: SUMMARY OF MAJOR ACTIONS FOR PROTECTING AND ENHANCING RIVER VALUES—COMMON TO ALTERNATIVES 2-6**

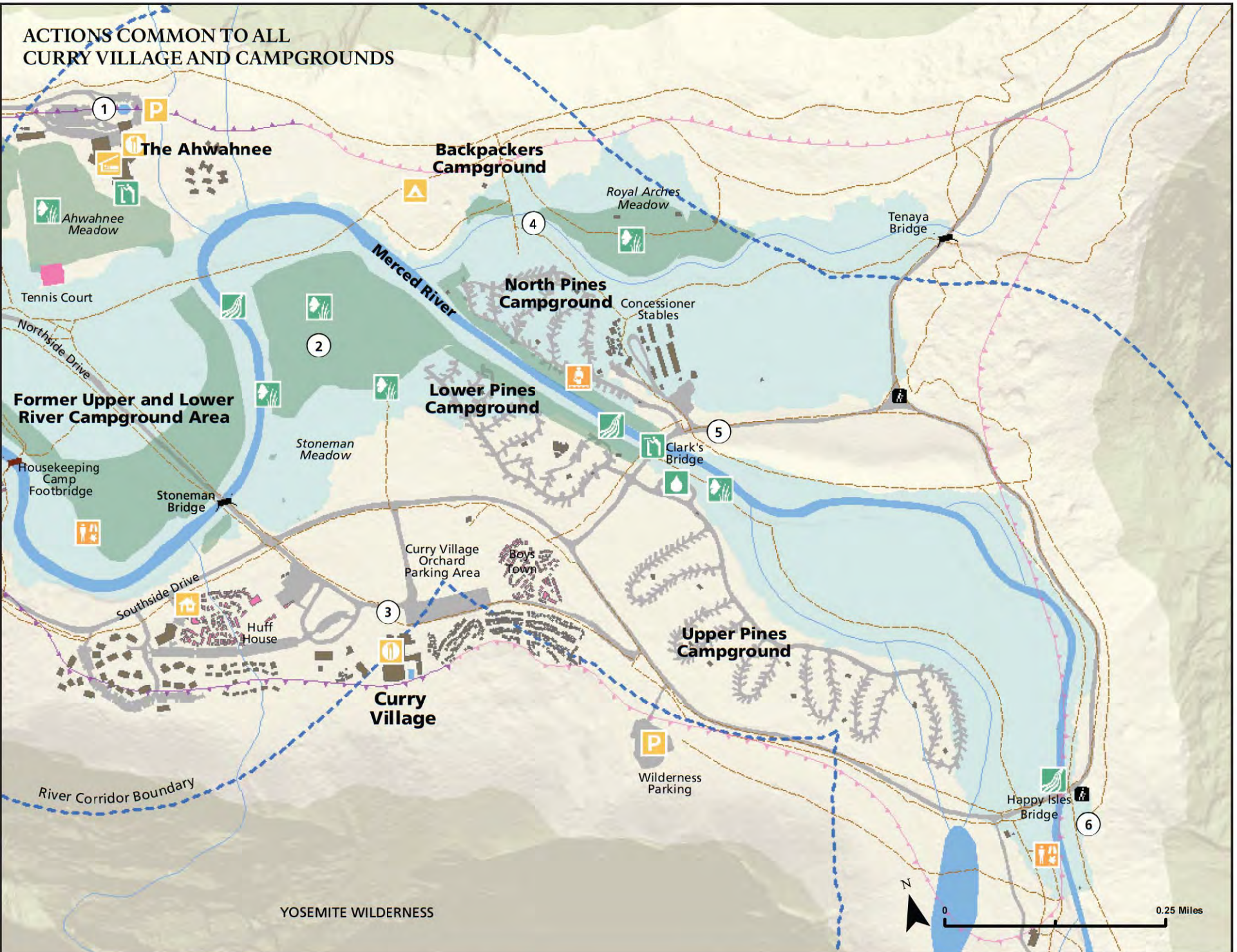
Ecological Restoration Actions (Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values)	
<b>Corridorwide</b>	
<b>Ecological Restoration Acreage</b>	164 acres total (refer to Appendix E for specific locations)
<b>Riprap to be Removed</b>	5,700 linear feet (refer to Appendix E for specific locations)
<b>Segment 2: Yosemite Valley</b>	
<b>Free Flow / Geologic/Hydrologic Values</b>	<ul style="list-style-type: none"> <li>Place large wood into river banks and river channel and construct log jams between Clark’s and Sentinel bridges to enhance riparian habitat and channel complexity.</li> <li>Remove riverbank riprap.</li> <li>Remove the Happy Isles bridge footings and outdated infrastructure at the Pohono gauging station.</li> </ul>

**TABLE 8-8: SUMMARY OF MAJOR ACTIONS FOR PROTECTING AND ENHANCING RIVER VALUES—COMMON TO ALTERNATIVES 2-6**

<b>Ecological Restoration Actions (Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values)</b>	
<b>Segment 2: Yosemite Valley (continued)</b>	
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>At a minimum, remove existing campsites from within 100 feet of the bed and banks of the river.</li> <li>Establish a riparian buffer to prohibit any new development within 150 feet of the bed and banks of the river.</li> <li>Move Yosemite Village Day-use Parking Area parking north at least 150 feet away from the river.</li> <li>Implement a 50-foot riparian setback from Indian Creek.</li> <li>Direct river access to resilient sandy beaches and sandbars; fence off sensitive riparian areas and restore native riparian vegetation.</li> </ul>
<b>Meadow Restoration</b>	<ul style="list-style-type: none"> <li>Remove abandoned infrastructure, including tiles, pipes, and abandoned roads, and ecologically restore sites.</li> <li>Improve meadow hydrology by removing artificial fill, filling ditches, constructing culverts, and removing remnants of abandoned underground utilities to enhance water flows into meadows (actions in particular meadows would sometimes vary among alternatives).</li> <li>Remove 6 miles of informal trails to reduce meadow fragmentation; restore disturbed areas to natural conditions; eliminate some roadside parking and fence some areas to reduce the potential for informal trailing through sensitive meadow habitat.</li> <li>Eliminate some roadside parking and fence some areas to reduce the potential for informal trailing through sensitive meadow habitat.</li> <li>Improve the condition of plant communities at specific locations in Yosemite Valley (67 potential acres targeted) by restoring the mosaic of meadow, riparian deciduous, black oak, and open mixed conifer forest vegetation. Management actions could include revegetation, prescribed fire, mechanical removal of conifers, and infrastructure redesign.</li> </ul>
<b>Segment 4: El Portal</b>	
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore Greenemeyer sand pit.</li> <li>Enhance valley oaks in Old El Portal by creating an oak recruitment area of at least 1 acre in the vicinity of the current bulk fuel storage area.</li> </ul>
<b>Segment 7: Wawona</b>	
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore portions of the Wawona campground. Relocate or remove all campsites currently within 100 feet of the bed and banks of the river.</li> </ul>
<b>Scenic Values</b>	
<b>Segment 2: Yosemite Valley</b>	
<b>Iconic Scenic Views</b>	<ul style="list-style-type: none"> <li>Reduce visual intrusions as part of the ecological restoration program.</li> <li>Ensure that new development is protective of scenic values.</li> <li>Implement management treatments, including removal of vegetation, to protect views from 47 vista points within the river corridor.</li> </ul>
<b>Cultural Values</b>	
<b>Segment 2: Yosemite Valley</b>	
<b>Ethnographic and Archeological Resources</b>	<ul style="list-style-type: none"> <li>Remove informal trails, non-essential roads, and infrastructure that impacts archeological sites.</li> <li>Delineate bike paths, roads, bridle paths, parking, staging, and trails away from sensitive cultural and ethnographic resource areas.</li> <li>Remove graffiti, and install fencing around rock art and other sensitive features to discourage inappropriate visitor use.</li> <li>Develop site management plans for archeological sites with complex uses and impacts such as Yosemite Village.</li> </ul>
<b>Recreational Values</b>	
<b>Segment 2: Yosemite Valley</b>	
<b>River-related Recreation</b>	<ul style="list-style-type: none"> <li>Improve circulation and access while reducing crowding at key attraction sites.</li> <li>Manage boating to improve dispersed recreation along the river in Yosemite Valley.</li> </ul>



# COMMON TO ALL ACTION ALTERNATIVES



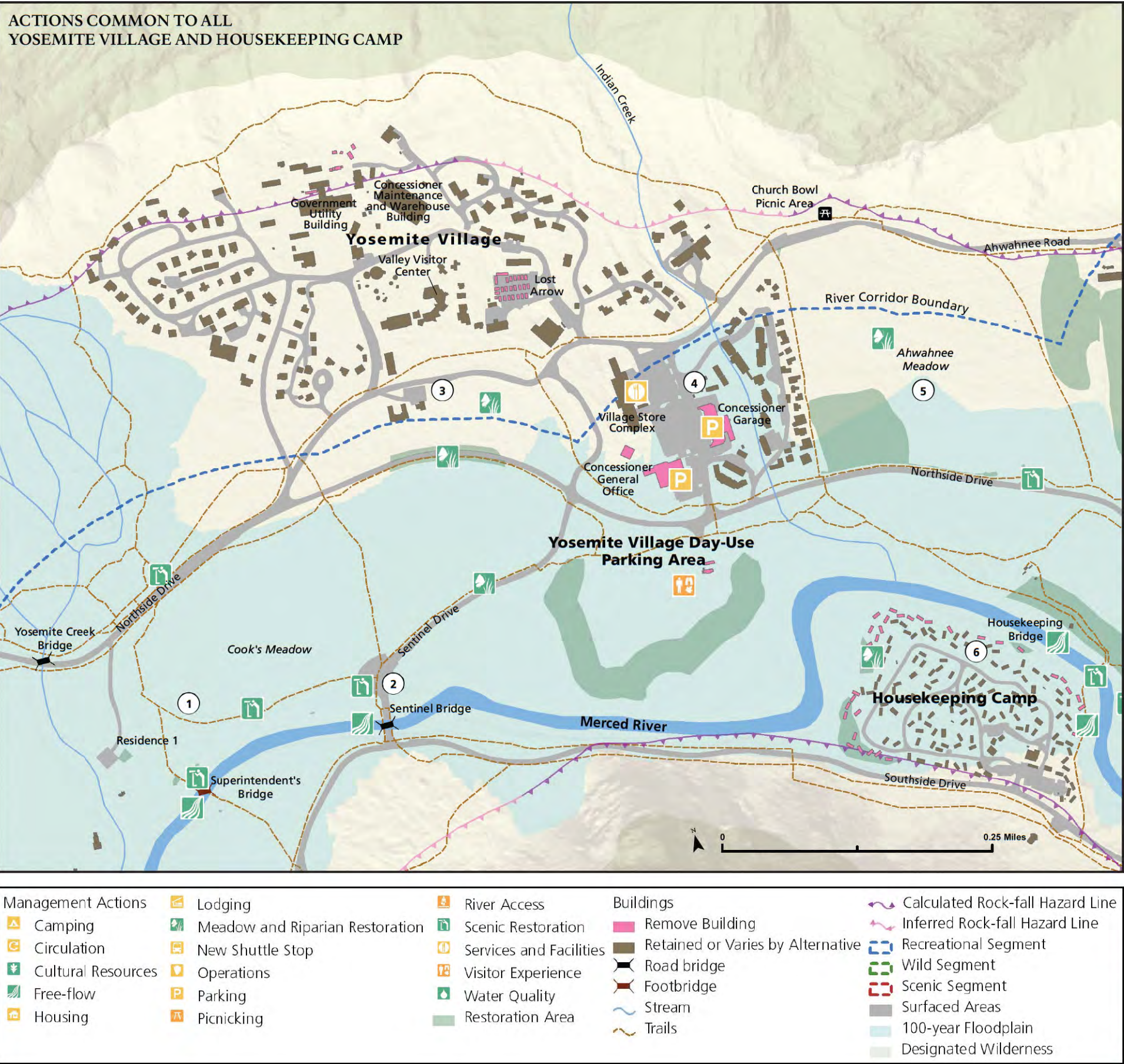
## EAST YOSEMITE VALLEY: CURRY VILLAGE AND CAMPGROUNDS

- The Ahwahnee**
    - Meadow Restoration:** Restore 5.7 acres by removing conifers to reconnect isolated meadow portions to improve hydrologic connectivity. Remove tennis courts from black oak woodland and ecologically restore area.
    - Scenic Views:** Selectively thin trees that encroach on views toward Yosemite Falls and maintain views from inside the historic building.
    - Lodging:** Retain the existing 123 units.
    - Parking:** Redesign existing parking lot; providing for proper drainage. Construct new 50-space parking lot east of the area. Follow Ahwahnee Historic Structure Report and cultural landscape report recommendations for parking area configuration and gatehouse restoration.
    - Services and Facilities:** Retain bar and food service, dining room, gift shop, and sweet shop. Remove pool.
  - Stoneman Meadow and River Reach Between Bridges**
    - Meadow Ecological Restoration:** Use restoration fencing to protect the meadow's north end. Remove encroaching conifers and invasive plants.
    - Interpretation of River Processes:** Create an interpretive nature walk through Lower Rivers area that emphasizes river-related natural processes and stewardship.
    - Large Wood Management:** Leave large wood in river that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks.
    - Hydrologic Processes:** Place eight naturally-looking constructed log jams to address river widening in the channel between Clark's and Sentinel Bridges. Restore riverbank erosion through brushlayering and revegetation.
    - Riparian Restoration:** Ecologically restore 20 acres of the former Lower Pines Campground, which was closed after the 1997 flood.
  - Curry Village**
    - Curry Village Residential Area:** Remove temporary housing at Huff House and Boys Town. Replace with new housing units at Huff House to accommodate 164 employee beds.
    - Services and Facilities:** Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center, and Curry Village swimming pool. Remove the Happy Isles snack stand, bike and raft stand, and Curry Village ice rink. Eliminate commercial horseback day rides at Concessioner Stables in Yosemite Valley.
    - Wilderness Parking Area:** Formalize parking using best management practices to protect water quality. Remediate soils in the area, which was once a landfill site for Curry Village.
  - North Pines and Backpackers Campgrounds**
    - Backpackers Campground Western Expansion:** Construct 16 new camping sites west of Backpackers Campground.
    - Royal Arches Meadow Restoration:** Remove conifers, decompact soils, and revegetate area with native species. Remove infrastructure, such as tiles, pipes, and abandoned road.
    - River Access:** Direct visitors at Lower and North Pines campgrounds to four resilient sandy beaches through signage and maps.
  - Clark's Bridge Area**
    - Clark's Bridge:** Place large wood to lessen scouring from the bridge, along with a constructed log jam.
    - Upper Pines RV Dump Station:** Relocate RV dump station and utilities away from the river to mitigate potential threat to water quality.
    - Riverbank Restoration:** Direct visitors to resilient river access point. Stabilize eroded riverbanks.
  - Happy Isles Area**
    - Happy Isles Wayfinding:** Improve wayfinding from the shuttle stop to Happy Isles and the Mist Trail.
    - Happy Isles Road Bridge:** Place large wood to lessen scouring from the bridge along with brush layering and a constructed log jam. Remove former footbridge abutments.
    - Pack Stock Trail:** Remove 3,800 feet of pack stock trail near the riverbank. Remove asphalt and decompact hardened surfaces. Re-vegetate with native plants.
- Cultural Resource Protection**
- Cultural Resource Protection:** Delineate trails; remove informal trails; and remove graffiti to protect culturally sensitive resources. Also, direct visitor use for additional protection.



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- EAST YOSEMITE VALLEY: YOSEMITE VILLAGE AND HOUSEKEEPING CAMP
1. Superintendent's Bridge Area

Cook's Meadow South Boardwalk: Selectively thin conifers encroaching on open vistas across the meadows and views of Yosemite Falls, Sentinel Rock, North Dome, and Glacier Point.

Superintendent's Bridge Free-Flowing Condition: Install constructed log jams on the Merced River, and utilize bioengineered stabilization on rip-rap to improve hydrologic function.

Superintendent's Bridge Scenic Views: Thin conifers to maintain views of Sentinel Rock and North Dome.

Hutchings View: Selectively thin conifers to maintain distant views of Half Dome, Yosemite Falls, Sentinel Rock, North Dome, Glacier Point, Royal Arches, and Washington Column.
2. Sentinel Bridge Area

Free-Flowing Condition: Place large wood to lessen scouring from the bridge. Place a constructed log jam to increase channel complexity.

Scenic Views: Selectively thin encroaching conifers and burn undergrowth to open distant views of Half Dome.

Informal Shoulder Parking: Remove roadside parking along Sentinel Drive that encroaches on sensitive habitat. Ecologically restore area to natural conditions.
3. West Yosemite Village

Informal Shoulder Parking: Remove roadside parking along Cook's Meadow. Restore meadow conditions.

Roadbed Restoration near Cook's Meadow: Remove fill of former roadbed north of Northside Drive between the Rangers' Club and the three-way stop. Re-vegetate with native meadow species.
4. East Yosemite Village

Village Visitor Contact Center: Re-purpose the Village Sport Shop for public use with pathways leading from the Yosemite Village Day-use Parking Area to the building. Remove the Arts and Activities Center (aka Bank Building).

Yosemite Village Services and Facilities: Retain Village Store and Grill. Re-purpose the Village Sport (Mountain) Shop as a visitor contact center.

Concessioner General Office: Remove building from river corridor. Re-locate essential concessioner functions to the Concessioner Warehouse and Maintenance Building.

Concessioner Garage Relocation: Remove Concessioner Garage building, and re-locate the function to the Government Utility Building area, outside the river corridor. Re-develop garage footprint as visitor parking. Expand visitor vehicle services in El Portal and Wawona service stations.

Indian Creek Area: Create a setback for Indian Creek by pulling parking and residential yard use back 50 feet from the creek. Fence area and restore native riparian vegetation.
5. Ahwahnee Meadow Area

Valley Meadow Ditch Restoration: Fill 2,155 feet of human-constructed ditches in Valley.

Ahwahnee Meadow Scenic Views: Selectively thin encroaching conifers from oak woodland and meadow to maintain distant view of Yosemite Falls, North Dome, Royal Arches, Half Dome, Glacier Point, and Castle Cliffs.
6. Housekeeping Camp Area

Ecological Restoration and River Access: Restore riverbank by brush-layering, decompacting soils, and planting riparian species. Direct visitors to two resilient beach locations at the western edge of camp. Fence off current eastern river access point on a steep eroded bank.

Scenic Views: Selectively thin conifers to maintain views of Glacier Point and Yosemite Falls.

Revetment Removal: Remove 3,400 feet of revetment built into the riverbank that impacts hydrologic flow. Re-vegetate with riparian species. Replace an additional 2,300 feet of revetment with bioengineered riverbank stabilization.
- Cultural Resource Protection

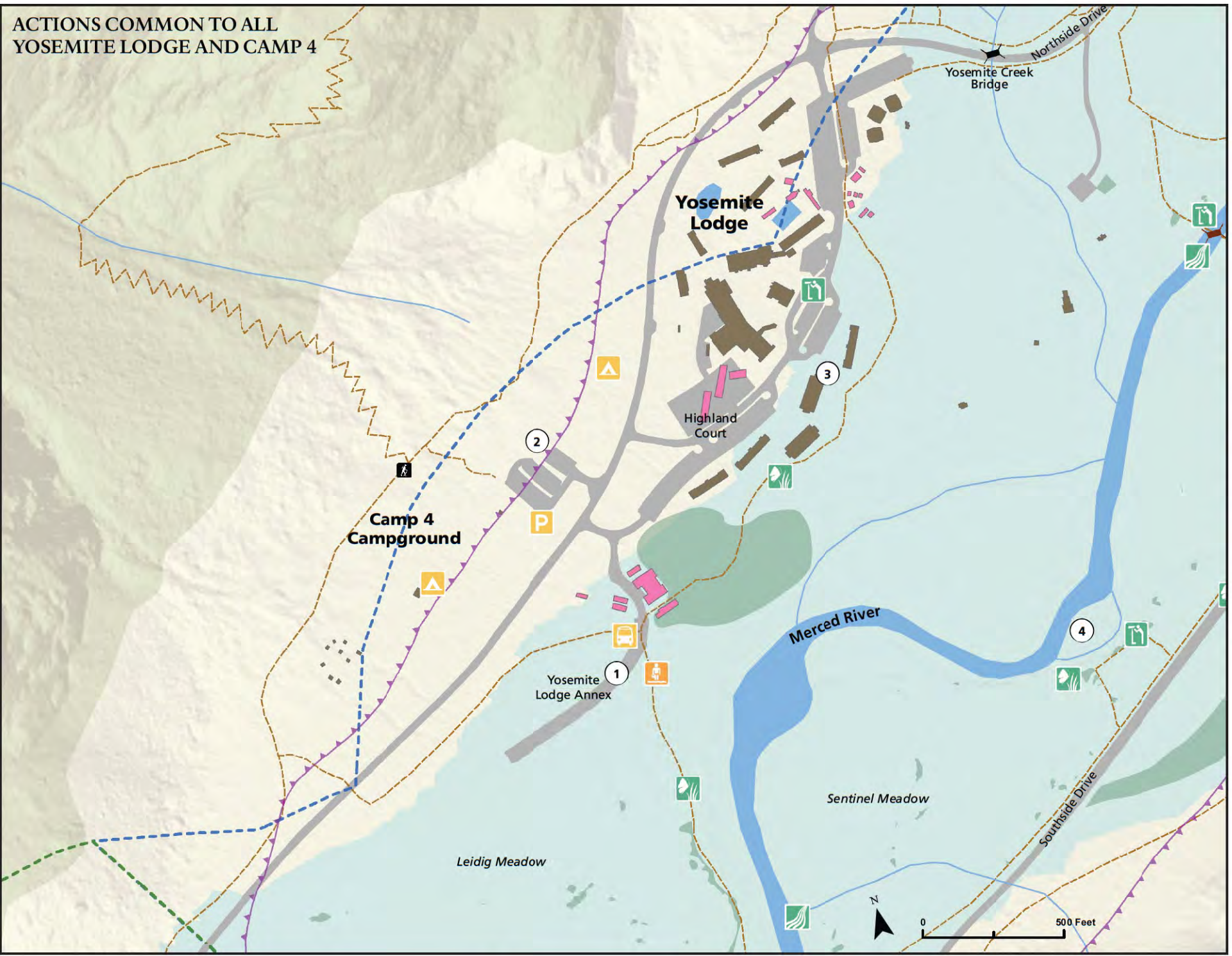
Remove informal trails that contribute to archeological site disturbance. Develop historic structure report and address recommendations for treatment to bring LeConte Memorial Lodge, which is an National Historic Landmark, to "good condition."



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# COMMON TO ALL ACTION ALTERNATIVES



Management Actions	Lodging	River Access	Buildings	Calculated Rock-fall Hazard Line
Camping	Meadow and Riparian Restoration	Scenic Restoration	Remove Building	Inferred Rock-fall Hazard Line
Circulation	New Shuttle Stop	Services and Facilities	Retained or Varies by Alternative	Recreational Segment
Cultural Resources	Operations	Visitor Experience	Road bridge	Wild Segment
Free-flow	Parking	Water Quality	Footbridge	Scenic Segment
Housing	Picnicking	Restoration Area	Stream	Surfaced Areas
			Trails	100-year Floodplain
				Designated Wilderness

## EAST YOSEMITE VALLEY: YOSEMITE LODGE AND CAMP 4

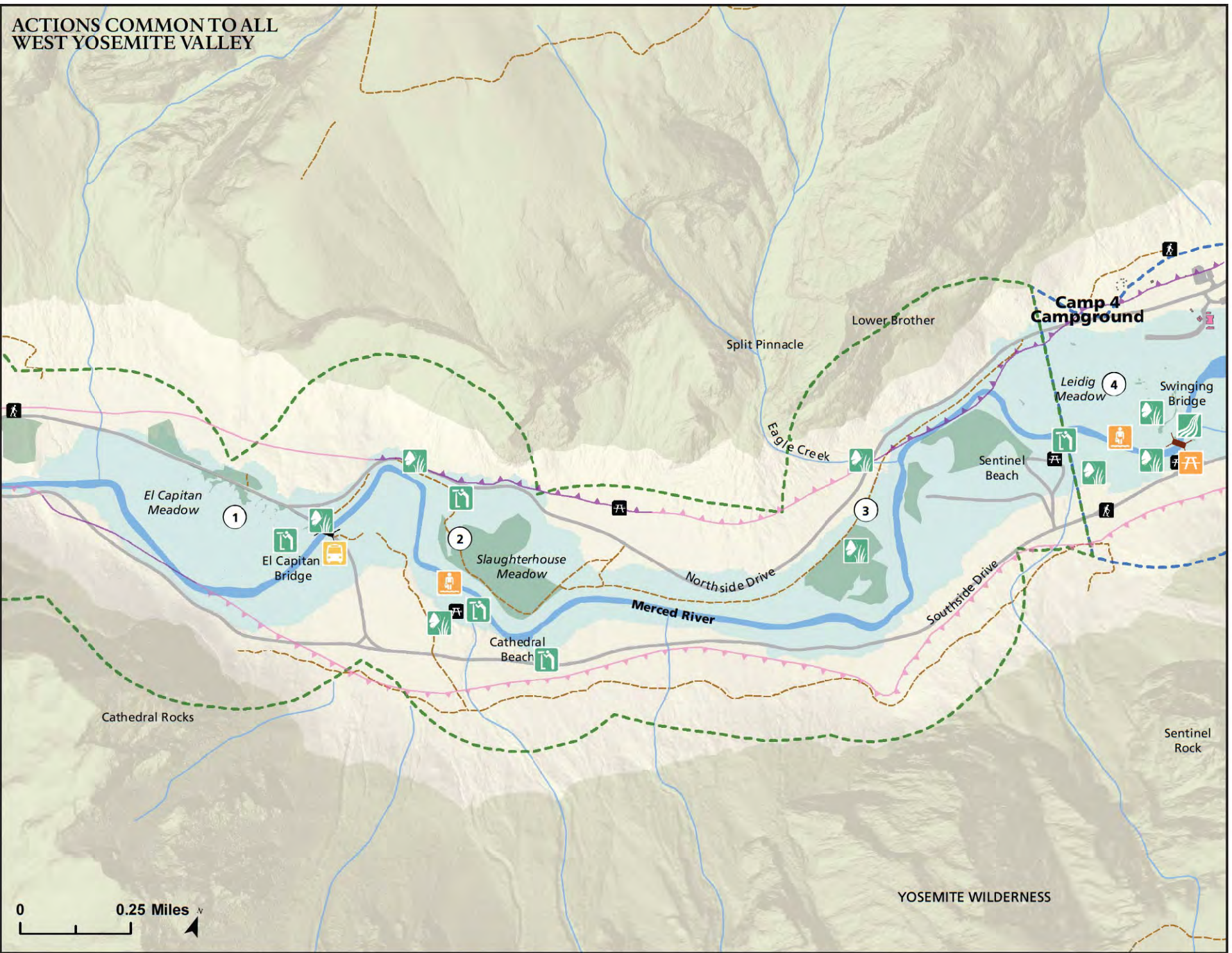
- Yosemite Lodge Annex**
    - Leidig Meadow Bike Path: Replace a section of paved trail within the bed and banks of the river with an elevated boardwalk.
    - Yosemite Lodge Beach Access: Direct river access to the Swinging Bridge sandbar and fence sensitive riparian area.
    - Former Yosemite Lodge Cabin Area Restoration: Restore 4.5 acres on western portion of Yosemite Lodge complex at site of lodging units removed after the 1997 flood. Remove fill, decompact soils, and plant native riparian species.
  - Camp 4 Area**
    - Parking: Construct a 41-space parking lot for the Camp 4 Campground.
    - Camp 4 Campground: Retain 35 campsites. Expand Camp 4 eastward with 35 additional walk-in sites.
    - Camp 4 Shuttle Stop: Construct a formal shuttle stop near Camp 4.
  - Yosemite Lodge Area**
    - Yosemite Lodge Portico Scenic Views: Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls.
    - Yosemite Lodge Concessioner Housing: Remove old and temporary housing at Highland Court and at the Thousands Cabins.
  - Sentinel Meadow**
    - Meadow Boardwalk: Add a 150-foot section of boardwalk to the west of the existing boardwalk to accommodate visitor use and reduce meadow trampling.
    - Meadow Scenic Views: Selectively thin conifers to maintain view of Half Dome, Yosemite Falls, Sentinel Rock, North Dome, Royal Arches, Cathedral Rocks, and Washington Column for boardwalk visitors.
- Cultural Resource Protection**
- Divert visitor use away from large bedrock mortar next to trail.



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# COMMON TO ALL ACTION ALTERNATIVES



## Management Actions

- Camping
- Circulation
- Cultural Resources
- Free-flow
- Housing

## Lodging

- Meadow and Riparian Restoration
- New Shuttle Stop
- Operations
- Parking
- Picnicking

## River Access

- Scenic Restoration
- Services and Facilities
- Visitor Experience
- Water Quality
- Restoration Area

## Buildings

- Remove Building
- Retained or Varies by Alternative
- Road bridge
- Footbridge
- Stream
- Trails

## Calculated Rock-fall Hazard Line

- Inferred Rock-fall Hazard Line
- Recreational Segment
- Wild Segment
- Scenic Segment
- Surfaced Areas
- 100-year Floodplain
- Designated Wilderness

## WEST YOSEMITE VALLEY

### 1. El Capitan and West Valley Meadows

**Plant Community Changes:** Improve condition of plant communities at specific locations in Yosemite Valley (67 potential acres targeted) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure re-design.

**El Capitan Meadow Restoration:** Re-route climber use trails on north side of road from meadow habitat to an appropriate upland route (a few meters to the east). Remove informal trails through meadow and oak woodland. Protect re-vegetated areas with fencing or other natural barriers and sign the area to reduce trampling of sensitive meadow vegetation. As opportunities arise through maintenance or restoration projects, improve hydrologic flow and meadow connectivity by extending the permeable road base across the entire segment of Northside Drive through El Capitan Meadow and add additional box culverts with bottom elevations equal to the meadow-surface elevation. Remove conifer saplings encroaching on meadow habitat.

**El Capitan Bridge River Access:** Re-direct visitors accessing the Merced River near El Capitan Bridge from sensitive riverbanks to resilient sandbar points. Fence and re-vegetate the eroded area.

**El Capitan Shuttle Stop:** Construct a formal shuttle bus stop in a location appropriate for the design for the restoration of the meadow and formalized river access.

**Upstream of El Capitan Moraine:** Localized ecological restoration would enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area. Restoration would include willow planting, brush layering, uninhibited accumulation, and strategic placement of large wood.

### 2. Devil's Elbow and Cathedral Beach

**Devil's Elbow Restoration:** Relocate parking from Devil's Elbow to the east of current parking lot. Delineate a trail for river access to the large sandbar to the east. Remove the informal trail. Restore meadow conditions.

**Cathedral Beach Picnic Area River Access:** Designate a formal river access point, and direct use to more resilient areas. Remove infrastructure in the 10-year floodplain. Restore area by fencing sensitive areas, decompacting soils and planting native vegetation. Selectively thin conifers to maintain views of El Capitan

### 3. Eagle Creek Area

**Eagle Creek Meadow Restoration:** Remove Eagle Creek/Rocky Point sewage plant abandoned infrastructure to restore 3.5 acres of meadow habitat. Remove berm and parking lot abutting the creek, add culverts to allow dispersed water delivery, and re-vegetate with native plants.

### 4. Sentinel Beach and Swinging Bridge Area

**Sentinel Beach Picnic Area:** Redesign the picnic area in its current location to better accommodate visitor-use levels at this picnic area. Formalize parking. Designate formal river access point. Re-establish riparian vegetation. Fence off sensitive areas, and re-direct use to more resilient areas. Selectively thin deciduous trees to open distant views upriver.

**Leidig Meadow Restoration:** Remove informal trails that incise and fragment meadow. Restore native meadow vegetation.

**Swinging Bridge Ecological Restoration:** Install protective fencing along denuded area. Re-vegetate with native plants. Connect new fencing to bridge to direct river access to a large sandbar downstream. Place a constructed log jam and large wood to lessen scouring from the bridge to improve hydrologic processes.

**Swinging Bridge Picnic Area:** Delineate picnic area by fencing and re-vegetate the river terrace 50 feet from the river. Use fences to re-direct visitor use across the bridge to river access to the Swinging Bridge sandbar. Remove revetment. Rebuild riverbank through bioengineering techniques. Re-establish riparian vegetation.

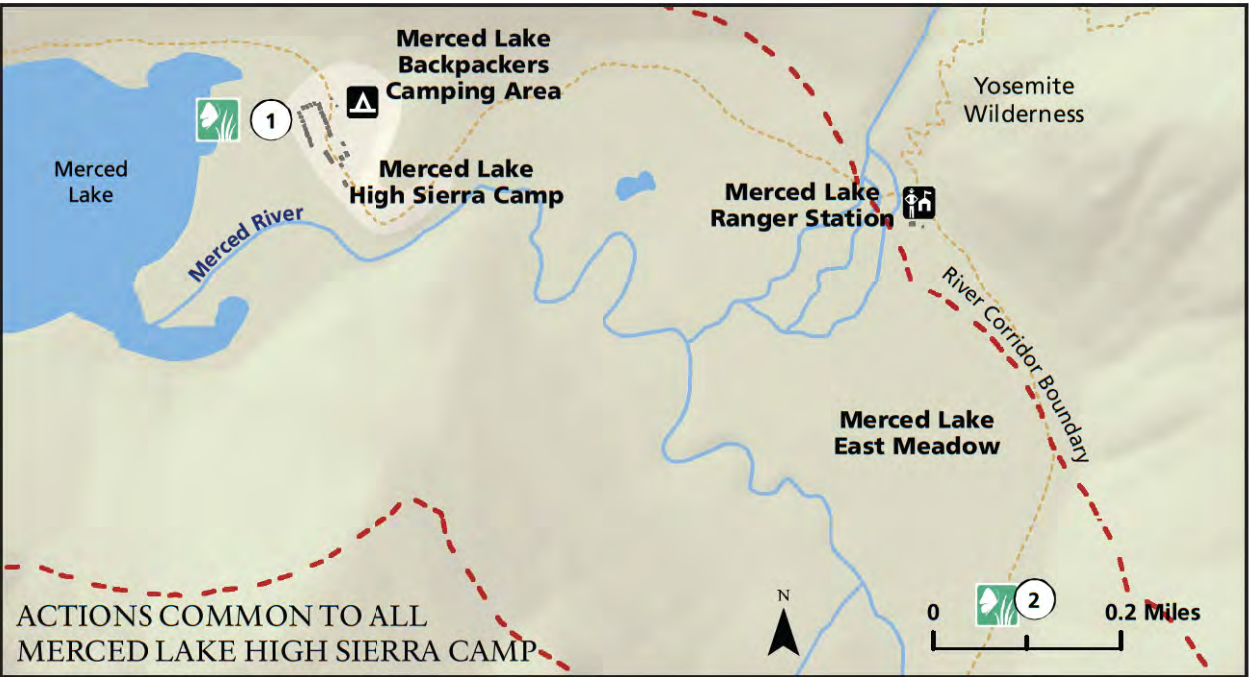
## Cultural Resource Protection

**Rehabilitate informal trails that impact archeological sites.** Prohibit climbing on rock art boulders. Divert visitor use away from prehistoric rock art shelter. Increase interpretation and education effort about cultural resources for climbers and other visitors.



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# COMMON TO ALL ACTION ALTERNATIVES



## MERCED LAKE HIGH SIERRA CAMP

1. Merced Lake Shore Meadow  
Restoration: Ecologically restore the meadow adjacent to the Merced Lake High Sierra Camp. Remove informal trails, decompact soils, fill ruts with native soils, and re-vegetate denuded areas.
2. Special-Status Plants  
Restoration: Re-route trails out of wetlands to avoid special-status plant habitat.



## EL PORTAL

1. NPS Administrative Complex  
Parking: Formalize and pave dirt parking area located across Foresta Road from NPS Warehouse building, using best management practices, within existing footprint. Remove informal roadside parking, between Foresta Road and the Merced River, and ecologically restore the area.
2. Rancheria Flat  
Employee Housing: Construct infill housing units to replace removed temporary housing in Yosemite Valley (the number of infill units varies across the alternatives).
3. Greenemeyer Sand Pit  
Restoration: Ecologically restore the former mine operation area to natural conditions. Remove nonnative fill material and re-contour.
4. Abbieville and Trailer Village  
Restoration: Remove asphalt and imported fill. Re-contour and plant native riparian species and oaks within 150 feet of the river.
5. Old El Portal  
Employee Housing: Construct infill-housing units, for 12 beds, in Old El Portal to replace Yosemite Valley temporary housing.
- Valley Oaks Restoration: Protect valley oaks in El Portal through best management practices related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the drip line of valley oaks.
- Fuel Storage Facility in the Floodplain: Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompact soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.

## Cultural Resource Protection

- Address abandoned infrastructure, and remove informal trails, and non-essential roads to protect archeological resources. The plan to address abandoned infrastructure will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution developed will include a recommended approach for deterring visitor use.

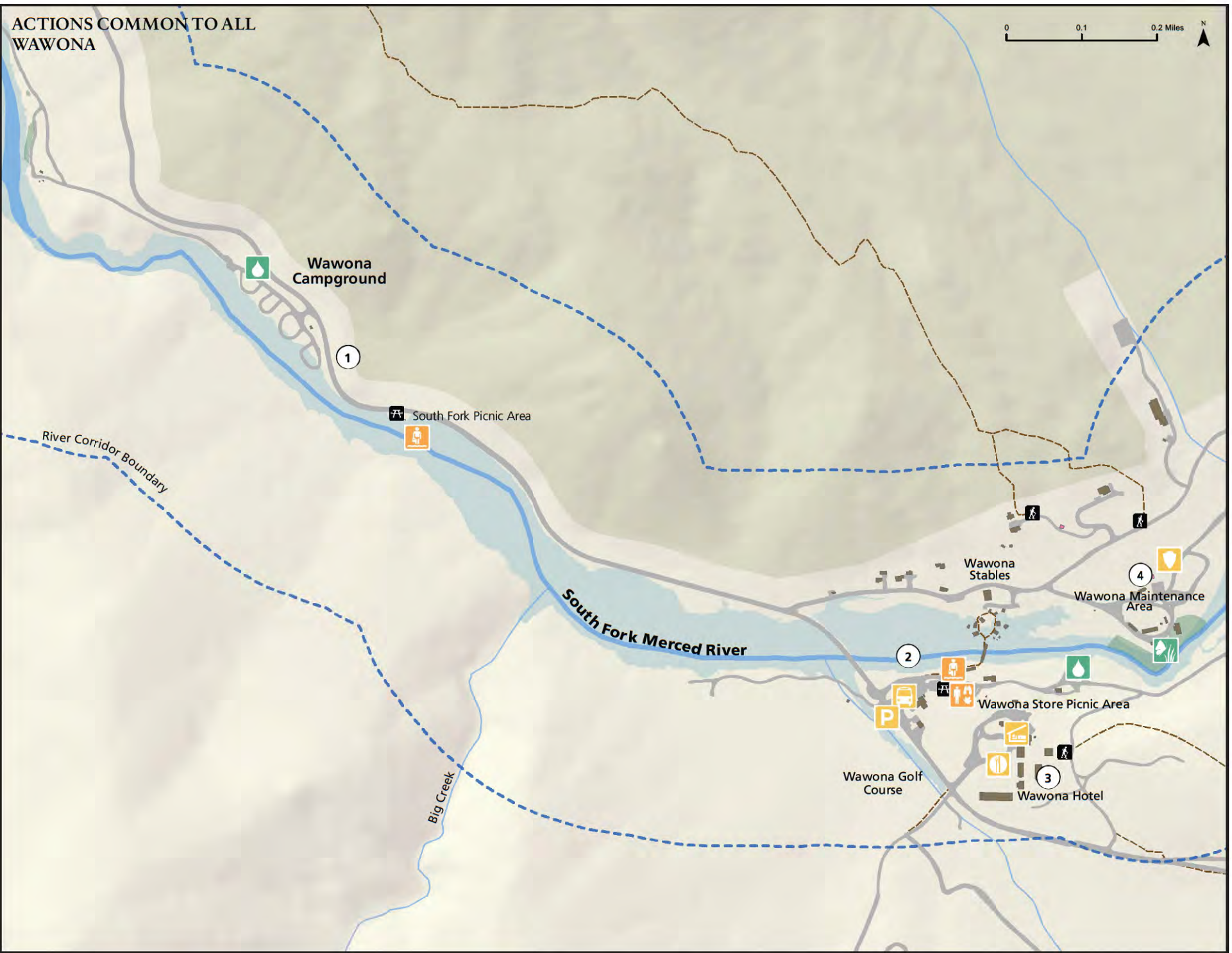
## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		

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# COMMON TO ALL ACTION ALTERNATIVES



## WAWONA

- Wawona Campground and South Fork Picnic Area**
    - Wawona Campground Septic System:** Remove septic system, and connect to the sewer system. Build a lift station above the campground to connect to the existing water treatment plant.
    - South Fork Picnic Area:** Delineate picnic area. Add formal river access and path to the South Fork Merced River that encourages visitors to walk in resilient areas.
  - Wawona Store Area**
    - Picnic Area and River Access:** Add picnic benches. Place fencing to direct visitors to three hardened river access points. Add a path to river that encourages visitors to walk in resilient areas.
    - Parking:** Retain day-use parking. Formalize eight tour bus parking spaces at Wawona Store. Remove roadside parking between store and Chilnualna Falls Road.
    - Shuttle Stop:** Retain all shuttles. Re-design bus stop for both tour buses and shuttles to accommodate existing visitor-use levels.
    - Public Restroom:** Replace existing public restroom facilities with larger restrooms to accommodate existing visitor-use levels.
    - Wawona Recreational Vehicle Dump Station:** Relocate the RV dump station to the Wawona Campground, away from the river. Design and construct the RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the ordinary high-water mark.
  - Wawona Hotel Area**
    - Lodging:** Retain the existing 104 lodging units at the Wawona Hotel.
    - Services/Facilities:** Retain hotel restaurant and swimming pool.
  - Wawona Maintenance Area**
    - Operations:** Construct a building and grounds facility, a combined structural and wildland fire station, and a roads facility. Rehabilitate CCC structures for potential re-use.
    - Ecological Restoration:** Remove staged materials, abandoned utilities, vehicles, and parking lot within 150 feet of the river. Restore native ecosystem.
- Cultural Resource Protection**
- Relocate two stock use campground sites from sensitive resource area. Remove informal trails. Remove shoulder and off-road parking from sensitive resource area. Follow the Wawona Hotel Historic Structures Report to bring contributing elements to "good" condition.

Management Actions	Lodging	River Access	Buildings	Calculated Rock-fall Hazard Line
Camping	Meadow and Riparian Restoration	Scenic Restoration	Remove Building	Inferred Rock-fall Hazard Line
Circulation	New Shuttle Stop	Services and Facilities	Retained or Varies by Alternative	Recreational Segment
Cultural Resources	Operations	Visitor Experience	Road bridge	Wild Segment
Free-flow	Parking	Water Quality	Footbridge	Scenic Segment
Housing	Picnicking	Restoration Area	Stream	Surfaced Areas
			Trails	100-year Floodplain
				Designated Wilderness

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### ***Free-flowing Condition***

Management considerations associated with this river value include the riverbank riprap, infrastructure within the bed and banks of the river, and bridges. These considerations would be addressed under all the action alternatives by removing riprap (although the amount of riprap removed would vary by alternative) and by removing abandoned infrastructure from the river channel. Once these structures were removed, the natural topography would be restored and the sites would be revegetated with native riparian vegetation. The alternatives would vary primarily in whether any of the historic bridges would also be removed from the bed and banks of the river to improve free flow. To prevent future impacts, the NPS would require all projects involving construction within the bed or banks of the river to undergo a Section 7 analysis as described in Chapter 4.

The actions common to Alternatives 2-6 are listed below, by segment.

### **All Segments**

- Develop a set of best management practices for revetment construction and repair throughout the river corridor. Practices would include use of vertical retaining walls where possible to limit impacts on the river channel.

### **Segment 2: Yosemite Valley**

- Remove riprap from a minimum of 5,700 linear feet of river bank to restore natural river processes. Replace riprap with native riparian vegetation, and revegetate the river banks with riparian species (3,400 linear feet). Use bioengineering techniques where riverbank stabilization is necessary for infrastructure protection (2,300 linear feet).
- Remove remnants of former sewer treatment facilities, sewer and water lines, and man-holes.
- Remove the abutments and infrastructure associated with the former Happy Isles footbridge; remove the river gauge base.
- Move the gauging station north of the river outside of the bed and banks of the river.
- Place large wood to lessen the scouring from the bridge abutments on all remaining bridges. Use brush layering and place constructed log jams.

### **Segment 4: El Portal**

- Remove abandoned infrastructure and imported fill at the Cascades Picnic Area, Abbieville, and Trailer Village.
- Ecologically restore to natural conditions at Greenemeyer Sandpit by removing fill material and re-contouring while maintaining river and utility access.
- Develop standards for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide Caltrans with recommendations when repair/replacement is necessary.

### **Segments 6/7: Wawona and Wawona Impoundment**

A water conservation plan is in effect at Wawona to help ensure that water withdrawals remain within levels determined by a minimum flow analysis to be protective of the river's free flowing condition and water

quality (see Chapter 5). Additionally the following actions would be taken under Alternatives 2-6 to protect the river's free-flowing condition.

- Retain the current water collection and distribution system at the Wawona Impoundment.
- Remove abandoned infrastructure from the South Fork side channel.

### ***Water Quality***

Management considerations pertaining to water quality include the impacts of surface water runoff from parking lots; potential hazards related to dump stations, septic tanks, and leach fields; and accelerated erosion and potential sediment loading in the Merced River. These considerations would be addressed under all the action alternatives by relocating facilities away from the river. (Actions to address accelerated riverbank erosion and potential sediment loading are addressed under "Geologic/Hydrologic Values," below.) The common actions that would be taken under Alternatives 2-6 are listed below, by segment.

#### **Segment 2: Yosemite Valley**

- Relocate the Upper Pines Dump Station away from the river to a site between Curry Village and the entrance to the Pines Campgrounds.
- Move the Yosemite Village Day-use Parking Area (Camp 6 portion) away from the river and implement best management practices to mitigate stormwater runoff (see Appendix C: Mitigation Measures).

#### **Segment 4: El Portal**

- Pave the parking area at the NPS Maintenance and Administrative Complex using best management practices (see Appendix C, Mitigation Measures) to formalize employee parking within the existing footprint. Remove the informal parking sites between Foresta Road and the river and restore the site to natural conditions.

#### **Segments 6/7: Wawona and Wawona Impoundment**

- Retain the current water collection and distribution system.
- Remove the current septic system for the Wawona campground. Develop a wastewater collection system and a pump station above the campground to connect the facility to the existing wastewater treatment plant.
- Relocate the Wawona RV dump site away from the river. Design and construct the RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the ordinary high water mark.
- Delineate the boundaries of the two formal picnic areas in Wawona. Add formal river access points and paths to river that encourages visitors to walk in the resilient areas. Harden the three steep river access points at the Wawona Store Picnic Area using rockwork or staircase construction to prevent riverbank erosion. If needed, place fencing to direct visitors to these hardened access points.

### ***Geologic/Hydrologic Values***

The fundamental alluvial processes in Yosemite Valley are affected by accelerated riverbank erosion in localized areas, lack of natural levels of large wood in the river system, altered surface and groundwater flow

patterns, and alterations to the distribution and extent of connected floodplain. Management considerations and concerns about riverbank stability and channel widening (see Chapter 5) would be addressed under all the action alternatives by enhancing channel complexity and mitigating the scouring that has been encouraged by riverbank instability. Effort would be focused on Segment 2 through Yosemite Valley. (Restoration of riparian habitat addressed further under “Biological Values,” below.)

### **Segment 2: Yosemite Valley**

- Incorporate large wood into riverbanks to enhance habitat quality and provide structure for eroded riverbanks. Place large wood in river to enhance channel complexity and mitigate scouring from bridges. Construct eight log jams in the river channel between Clark’s Bridge and Sentinel Bridge to address river widening and low channel complexity. Design log jams to look natural, retaining root wads and avoiding straight-cut edges. (This work is described in detail in Chapter 5 and in the Ecological Restoration Plan in Appendix E.)
- Remove the berm and parking lot abutting Eagle Creek to improve drainage and reduce channelization; add culverts to allow more dispersed water delivery to the Eagle Creek Meadow; revegetate with native upland species.
- Plant willows, install brush layering, and allow uninhibited accumulation and strategic placement of large wood to enhance channel complexity in localized areas of the river reach upstream of the El Capitan moraine to the Sentinel picnic area.

### ***Biological Values***

As described in detail in Chapter 5, management concerns include meadow fragmentation in several Yosemite Valley meadows localized impacts on riparian habitat along the river. These concerns would be addressed under Alternatives 2-6 through an extensive ecological restoration program that is described in detail in Chapter 5 and in the Ecological Restoration Plan in Appendix E. Alternatives 2-6 would differ primarily in the width of a riparian buffer along the river (and consequently in the amount of existing development that would be removed from the riparian zone) and in the extent of meadow restoration (and consequently in the amount of existing development that would be removed from meadows). The major common actions are summarized below, by segment:

### **All Segments**

- Establish a 150-foot riparian buffer for all segments of the Merced Wild and Scenic River. Prohibit new development within this buffer, which would extend 150 feet beyond the ordinary high-water mark on both sides of the river.

### **Segment 1: Wilderness above Nevada Fall**

#### ***Meadow Habitat***

- Remove informal trails that incise meadow habitat, trails in wet and/or sensitive vegetation, and trails that fragment meadow habitat, including trails in the Triple Peak Fork meadow, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and other areas as necessary.

## Segment 2: Yosemite Valley

### *Riparian Habitat*

- At a minimum, remove existing campsites from within 100 feet of the bed and banks of the river. (Some alternatives would remove additional development for a wider riparian buffer; see Chapter 5 for a detailed discussion of riparian buffers). This would require the removal of some campsites from the Backpackers Camp, North Pines Campground, and Lower Pine Campground (including removal of the loop between sites 60-62 that is within the bed and banks of the river); a portion of the Yosemite Village day parking; and many of the lodging units at Housekeeping Camp. (The alternatives would differ in the possible replacement of these facilities.)
- Establish a 50-foot buffer for Indian Creek. At Ahwahnee Row and Tecoya Dorms, relocate parking and reduce residential yards so that they are outside the 50-foot buffer; restore native riparian vegetation and protect with restoration fencing.
- Redirect visitor use to more stable and resilient river access points, such as sandbars, and designate formal river access sites. Use fencing and signing to protect sensitive areas and restore native riparian vegetation. Locations would include Upper Pines Campground, Upper and Lower River Campgrounds, and Housekeeping Camp (refer to Appendix E for additional site-specific details).
- Pave and formalize five roadside pull-outs for river access Between Pohono Bridge and the intersection of the Big Oak Flat Road. Install curbing along pull-outs and along El Portal Road to prevent further encroachment towards the river and associated resource damage. Completely remove one pull-out that is not protective of resources. In the areas that require ecological restoration following parking and river access formalization, decompact soil and revegetate with riparian species, including willow. Install drainage improvements and head walls at 11 locations.
- Use brush layering techniques to repair localized riverbank erosion, and revegetate areas with appropriate native plants. Protect revegetated areas with closure signs, fencing, and/or natural barriers, such as rocks and logs. Riverbanks that would be addressed include those adjacent to Backpackers Camp and the Lower Pines and North Pines Campgrounds; Housekeeping Camp; the Yosemite Lodge beach access; the Swinging Bridge, Sentinel Beach, and Cathedral Beach picnic areas Devil's Elbow; the riverside areas between Pohono Bridge and the El Portal Road/Big Oak Flat Road intersection; and along the Valley Loop Trail. (See Appendix E for a detailed description of these ecological restoration actions.)
- In accordance with NPS policy, continue management toward removal of nonnative species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize studies of the Western pond turtle and foothill yellow-legged frog.

Conceptual site drawings for river access improvements along El Portal Road have been completed to allow the analysis of impacts of this potential project. See "Conceptual Site Drawings" at the end of the "Common to Alternatives 2-6" discussion for site details and design drawings.

### *Meadow Habitat*

Ecological restoration of meadows in Yosemite Valley would involve the following general kinds of management activities:

- Remove abandoned infrastructure (including tiles, pipes, and abandoned roads) from meadow, riparian, and floodplain habitat. Decompact soils, remove fill, and revegetate with riparian species. Areas that would be addressed include the former Eagle Creek/Rocky Point Sewage Plant site, Royal Arches Meadow, Cook's Meadow, western (closed) portion of former Lower Pines Campground, and the former lodge cabin/volunteer center at Yosemite Lodge.

- Improve meadow hydrology by removing artificial fill, filling ditches, and constructing culverts to enhance water flows into meadows (actions in particular meadows would sometimes vary among alternatives).
- Remove 6 miles of informal trails in Yosemite Valley meadows; restore natural conditions by decompacting soils, filling ruts with native soils, and revegetating denuded vegetation with appropriate native plants. Define and delineate formal trails in meadows with signs, fencing, and/or other natural barriers such as rocks and logs
- Eliminate some roadside parking and fence some areas to reduce the potential for informal trailing through sensitive meadow habitat.
- Improve the condition of plant communities at specific locations in Yosemite Valley (67 potential acres targeted) by restoring the mosaic of meadow, riparian deciduous, black oak, and open mixed conifer forest vegetation. Management actions could include revegetation, prescribed fire, mechanical removal of conifers, and infrastructure redesign.

Specific meadows in Yosemite Valley would receive the following protective management under Alternatives 2-6 (additional actions might be taken to further enhance these meadows under some alternatives):

- **Bridalveil Meadow:** Address stream headcutting by inserting live willow cuttings into the disturbed riverbank and adjacent meadow; reestablish the riparian shrub layer in the meadow to enhance meadow habitat.
- **El Capitan Meadow:** Remove all informal trails; restore areas disturbed by foot traffic and other areas of bare, compacted soils to natural conditions. Reroute climber use trails on the north side of the road away from the El Capitan meadow habitat to an appropriate upland route (a few meters to the east). As opportunities arise through maintenance or restoration projects, improve hydrologic flow and meadow connectivity by extending the permeable road base across the entire segment of Northside Drive through El Capitan Meadow and add additional box culverts with bottom elevations equal to the meadow surface elevation. Remove conifer saplings encroaching on meadow habitat.
- **Eagle Creek Meadow:** Remove abandoned infrastructure from the vicinity of Eagle Creek; restore the meadow to natural conditions.
- **Leidig Meadow:** Replace a section of paved trail with an elevated boardwalk.
- **Cooks Meadow:** Remove roadside parking along Cook's Meadow at Sentinel Drive and Northside Drive; remove informal trails in Cook's Meadow; ecologically restore meadow to natural conditions. Address use patterns to protect meadow habitat and black oak woodland (this action would additionally enhance the cultural value of the black oak woodland).
- **Ahwahnee Meadow:** Remove abandoned irrigation lines and fill, fill in ditches, and re-vegetate with native meadow vegetation. Remove the abandoned tennis courts from the black oak woodland. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers (about 5.7 acres of meadow restoration). Remove the abandoned tennis courts from the black oak woodland.
- **Stoneman Meadow:** Redesign the Orchard Parking Lot and apply engineering solutions to promote water flow from the cliff walls to Stoneman Meadow.

## Segment 4: El Portal

### *100-Year Floodplain*

- Ecologically restore the Greenemeyer sand pit.



- Restore the rare floodplain community of valley oaks in Old El Portal through implementation of best management practices. Create a valley oak recruitment area of 2.5 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots. Decomact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.

## **Segments 6/7: Wawona and Wawona Impoundment**

### ***Riparian Habitat***

- Relocate or remove all campsites at the Wawona campground currently within 100 feet of the bed and banks of the river; ecologically restore native riparian habitat.

### ***Cultural Values***

Cultural values are associated with traditionally used plant populations, archeological sites throughout the corridor, and historic resources in Yosemite Valley and at Wawona. Management concerns include the sustainability of traditionally used plant populations, notably black oak in Yosemite Valley. Management considerations include impacts to archeological sites caused by visitor use, and the condition of certain historic buildings and structures that are currently only in fair condition. These concerns and considerations would be addressed similarly under Alternatives 2-6, with little difference among the alternatives. The major common actions are summarized below, by segment:

## **Segment 2: Yosemite Valley**

### ***Traditionally Used Plant Populations***

Natural conditions for traditionally used plant populations would be restored in selected locations:

- Implement specific actions in the ecological restoration plan and the invasive plant management program aimed at addressing impacts to traditionally used plant populations.
- Introduce new black oak seedlings into stands stressed by past human activities.
- Implement more general actions to restore ecological conditions to meadow and riparian areas.

### ***Archeological Sites***

Many of the actions common to Alternatives 2-6 related primarily to visitor use and ecological restoration would also be protective of archeological sites. In addition, all the action alternatives would include ongoing inventory, documentation and monitoring, increased interpretation and outreach to help visitors understand the importance of protecting sensitive resources, and the development of archeological site management plans for areas with complex uses and impacts. The common actions are listed below.

- Protect archeological sites by managing visitor use and development:
  - Manage visitor use levels; design and locate facilities to direct use and avoid sensitive cultural and ethnographic resource areas.
  - Remove informal trails; use natural features to conceal and divert foot traffic around sites.
  - Protect rock art by removing graffiti and installing fencing to discourage inappropriate visitor use.

- Mitigate the potential effects of ecological restoration activities on archeological sites by using noninvasive techniques wherever possible.
- Remove climbing hardware from sensitive cultural features.
- Develop site management plans for archeological sites in areas with complex uses and impacts, such as Yosemite Village. The purpose of the plans would be to avoid resource loss through park actions such as development, repair, and maintenance of facilities and underground utilities.

### ***Historic Structures***

Historic structures that have fallen into fair or poor condition would be managed to return them to good condition through the following actions:

- Implement the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee parking lot to bring the Ahwahnee stone gate house and the Ahwahnee parking lot to “good” condition.
- Develop a historic structures report for the LeConte Memorial Lodge National Historic Landmark to determine the rehabilitation needed to bring the building to “good” condition.
- Rehabilitate the Superintendent’s House (Residence 1) per the Secretary of the Interior’s Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (Lingo 2012) to bring the building to “good” condition. This rehabilitation of the building would occur under all action alternatives, regardless of whether the building was relocated.

## **Segment 4: El Portal**

### ***Archeological Sites***

In recognition of the high cultural significance of sites CA-MRP-0181/H, CA-MRP-0250/H and CA-MRP-0251/H for traditionally associated American Indians, these sites would be protected from any further development. In addition, the following management action would occur:

- Prepare a plan of action for addressing the abandoned infrastructure on site CA-MRP-0181/H in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed would include a recommended approach for deterring visitor use within the site.

## **Segment 5: South Fork above Wawona**

### ***Archeological Sites***

The rock rings in this segment would be protected as follows:

- Complete documentation of rock ring features
- Remove informal trails and charcoal rings
- Inform Wilderness visitors about the importance of protecting archeological resources, and restrict Wilderness camping in the area of the site.

## Segments 6/7: Wawona and Wawona Impoundment

### *Archeological Sites*

Impacts to the Wawona Archeological District associated with park operations, visitor use, and natural forces would be minimized by the following management actions:

- Increase monitoring frequency for affected sites; increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend the district's National Register of Historic Places nomination to reflect district changes and impacts.
- Remove seven campsites from the Wawona Campground in culturally sensitive areas.
- Remove shoulder and off-road parking at the Wawona Hotel to protect cultural resources.

### *Historic Structures*

- Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to return the contributing elements at Clark Cottage to good condition.
- Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to return the contributing elements at the Main Hotel, Manager's Cottage, and Annex Building to good condition.

### *Scenic Values*

As described in detail in Chapter 5, visitor and administrative facilities intrude into the outstandingly remarkable natural scenery at several locations within the river corridor. Notable visual intrusions are caused by the Merced Lake High Sierra Camp (Segment 1) and by certain roads, traffic, and structures in Yosemite Valley (Segment 2). Natural scenery in Yosemite Valley is also diminished by unnatural conditions along river banks and in meadows, where eroded or compacted soils and denuded or trampled vegetation detracts from views. In other locations vegetation is intruding into views from scenic vista points traditionally enjoyed by park visitors, or into direct and foreground views of the river, often with peaks and walls rising in the background.

These considerations would be addressed under all the action alternatives by ecologically restoring natural conditions to riparian and meadow habitat, ensuring that future development is protective of scenic values, and managing vegetation at important vista points to protect viewing opportunities. The alternatives would differ primarily in the amount of existing development that would be removed to protect scenic values. The actions common to Alternatives 2-6 are listed below, by segment.

## Wild Segments 1 and 5: Wilderness above Nevada Fall and South Fork Merced River Above Wawona

Visual intrusions in these wild segments would be reduced or avoided through the following actions:

- Conduct a Visual Resource Management (VRM) contrast analysis (described in Chapter 5) to ensure that future development would not exceed a contrast rating of 4.

## Segment 2: Yosemite Valley

Reduce visual intrusions by removing unnecessary facilities from the river corridor (see the Analysis of Public-Use Facilities and Services, below, for the list of facilities that would be removed under all the action alternatives).

Improve natural scenery as part of the ecological restoration program:

- Ecologically restore eroded river banks, informal trails, and riparian vegetation that affect direct and foreground views of the river, river-dependent resources, and the peaks and walls rising above the river.
- Avoid future visual intrusions into the riparian zone by requiring a 150-foot setback from the ordinary high-water mark for any new development.
- Eliminate visual intrusions from meadows associated with informal trails.

Protect air quality by continuing to cooperate with regional authorities to reduce airborne contaminants caused by combustion, including carbon dioxide emissions, smoke caused by fire, and particulate matter generated by construction.

Ensure that new development or redevelopment in Yosemite Valley is protective of scenic values:

- Follow the guidance provided in “A Sense of Place: Design Guidelines for Yosemite Valley” in the location and design of new facilities. These design guidelines are intended to promote harmony between the built and natural environments.
- Conduct a Visual Resource Management (VRM) contrast analysis (described in Chapter 5) to ensure that future development would not exceed a contrast rating of 13 for West Yosemite Valley or a contrast rating of 22 for East Yosemite Valley.
- Selectively thin conifers and other trees and shrubs that encroach on selected scenic vista points (47 vista points, 14 of which have prominent views of the river in the foreground and 33 of which occur within the broader river corridor). See Appendix H, Scenic Vista Actions in the Merced River Corridor, for details regarding scenic vista actions.

## Segment 3: Merced Gorge

Ensure that new development or redevelopment is protective of scenic values:

- Conduct a Visual Resource Management (VRM) contrast analysis (described in Chapter 5) to ensure that future development would not exceed a contrast rating of 13.

## *Recreational Values*

As described in Chapter 5, management considerations for the recreational value in the wild segment above Nevada Fall are high levels of use and crowding at designated camping areas and high encounter rates along the trail between Little Yosemite Valley and Merced Lake.

In Yosemite Valley, the NPS determined there is a management concern on the recreational value resulting from a substantial shortage of parking available during the summer season (see Chapter 5 for more information). In addition, there are management considerations regarding the supply of Wilderness parking, insufficient parking at The Ahwahnee, crowding and congestion at popular attraction sites, and resource impacts resulting from boating activity.

## Segment 1: Wilderness above Nevada Fall

Alternatives 2-6 provide options to reduce, repurpose, or remove the Merced Lake High Sierra Camp to address impacts on wilderness experience at that location. Alternatives 2-6 also propose reductions in the Wilderness zone capacities to address crowding and encounter rates on trails (see User Capacities, Land Use, and Facilities Management – Visitor Overnight Capacity – Segment 1, below, for more on zone capacities.)

In addition, the following actions would be common to Alternatives 2-6:

### *Recreation Activity Participation*

- Provide opportunities for hiking, backpacking, and stock-use.
- Allow private boating on the stretch of river above Nevada Fall.

### *Recreational Setting Attributes*

- Enhance wilderness quality by providing education on “Leave-No-Trace” and minimum impact practices, maintaining regulations on food storage, area closers, resource monitoring, and regular ranger patrols and trail maintenance. Actions to protect natural and cultural ORVs would also benefit the recreational values by providing high quality settings for visitors to enjoy.

### *Recreational Experience Quality*

- Provide opportunities for solitude in designated Wilderness by managing overnight capacity through the Wilderness trailhead quota and permit system, maintaining group size limits, monitoring resources to study the effects of visitor use, and implementing area closures where necessary to protect river values.

## Segment 2: Yosemite Valley

Alternatives 2-6 consider a variety of management responses to address the management considerations identified in Chapter 5. Primary among these is the user capacity management program, which is used to drive decisions that result in common actions specifically addressing user capacity. (These are presented below under the heading “User Capacity, Land Use, and Facilities Management.”) User capacity, as it relates to specific locations and uses, is also addressed in detail and under each individual alternative.

Many general actions regarding the recreational setting, recreational activities, and quality of the recreational experience in Yosemite Valley would be common to Alternatives 2-6, and these are summarized below:

### *Recreational Activity Participation*

A range of high-quality, resource-based recreational and interpretive opportunities would be sustained by

- continuing use of the camping and lodging reservation systems
- improving facilities such as restrooms and trails
- improving infrastructure to promote access for people with disabilities
- monitoring and studying the effects of visitor use

Boating would be managed to prevent resource impacts by

- designating put-in and take-out locations
- conducting periodic checks of vessels for aquatic invasive species; and maintaining the prohibition on motorized boats

Swimming would be allowed on all segments of the river, except where disallowed in the Superintendent's Compendium.

### ***Recreational Setting Attributes***

Monitoring of the visitor densities and parking occupancies would ensure use does not exceed acceptable levels for key attraction sites and parking areas that provide for recreational access to the river. Actions to protect natural and cultural ORVs would also benefit the recreational values providing high quality settings for visitors to enjoy.

### ***Recreational Experience Quality***

Under Alternatives 2-6, monitoring of the visitor densities and parking occupancies (see Chapter 5) would ensure use did not exceed acceptable levels for key attraction sites and parking areas that provide for recreational access to the river.

## **User Capacity, Land Use and Facilities Management**

### ***Visitor Activities and Services***

The overall diversity of activities that currently exists within the river corridor would generally be retained under Alternatives 2-6.

### **Segment 1: Wilderness above Nevada Fall**

The primary river-related activities would remain hiking and overnight backpacking. The following management actions would be common to Alternatives 2-6:

Use would be managed in accordance with the findings of the "Determination of Extent Necessary" (Appendix L). Following is a summary of the management that would be common to all the action alternatives:

- Disallow camping or travel by commercial groups more than ¼ mile from a maintained trail or public access road.
- Limit all commercial stock trips to a 1:1.5 person-to-stock ratio. Accordingly, for every multiple of 3 persons (including employees), only two pack animals would be allowed in addition to three riding stock.
- Apply additional seasonal and weekend restrictions in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones as specified in Appendix L.
- Private boating would be allowed using dispersed, undesignated put-ins and take-outs. Generally, this kind of use would consist of short floats using pack raft or other craft that can easily be carried into this remote area. (The alternatives would vary in whether or not use levels would be restricted.)

## Segment 2: Yosemite Valley

The primary river-related activities would remain swimming, floating and water play, fishing, hiking, biking, climbing, camping, creative pursuits (such as writing, painting, photography), and educational and interpretive pursuits (such as attending ranger-led walks and programs). All the action alternatives would include the following actions to protect and enhance river-related recreation and reduce congestion at attraction sites:

- Allow private boating (commercial boating would be allowed only under Alternatives 4 and 6). Expected water craft would include rafts, kayaks, paddle boards, inner tubes, and inflatable mattresses. The locations where boating would be allowed would also vary among the alternatives.
- Create an interpretive nature walk through the Lower River area that emphasizes river-related natural processes, the park's ecological restoration work, and what visitors can do to protect the river.
- Improve opportunities for picnicking at the Cathedral, Sentinel, and Swimming Bridge picnic areas.
- Discontinue stock day rides provided by the concessioner.
- Improve the sense of arrival for park visitors as they are guided toward the primary Yosemite Village day-use parking area.
- Reduce congestion at Bridalveil Fall by redesigning trails, boardwalks, and the viewing platform at the base of the fall; improve accessibility; provide restrooms.

Alternatives 2-6 would eliminate services and facilities that were not determined necessary for public use. All existing and potential facilities were analyzed against two criteria: Is the facility needed for public use or resource protection, and if the facility is necessary, is it feasible to relocate it outside the river corridor? The results of this analysis, conducted for both visitor use and administrative facilities across all segments of the river corridor, is presented in tables located near the end of each alternative description. Results that were common across Alternatives 2-6 are presented in Table 8-11 at the end of this Actions Common to Alternatives 2-6 section. The following is a summary of the findings of that analysis related to visitor facilities in Segment 2:

- Visitor facilities that would be removed under all alternatives:
  - The Ahwahnee swimming pool and tennis court
  - Yosemite Village concessioner general offices, garage, and the art activity center/bank building (relocated outside the river corridor)
  - Yosemite Lodge swimming pool, snack stand, bike stand, and post office
  - Happy Isles snack stand
  - Curry village ice rink, bike stand, raft stand, and stock day rides
- Visitor facilities that would be reduced or converted to another use:
  - Yosemite Village sports shop (converted to noncommercial visitor use)
  - Yosemite Lodge nature shop (converted to noncommercial visitor use)
  - Lower Pines and North Pines Campgrounds (reduced)
  - Housekeeping Camp Lodging Units (reduced)



### **Segment 3: Merced Gorge**

Alternatives 2-6 would provide for similar kinds and amounts of use as exist today. The primary activity in this segment would remain scenic driving along Highway 140, with some picnicking, swimming, and fishing in summer, when the river is low and the air and water temperatures are warm, and rock-climbing during the spring and fall seasons, when the rock is dry and temperatures are cool.

### **Segment 4: El Portal**

Most recreational activities that currently take place in this segment are swimming, fishing, and boating by community residents, while the vast majority of park visitors pass through enroute to Yosemite Valley and other park destinations. However, additional use by visitors who might not continue into the park would be expected in this segment in the future. This use would be supported under Alternatives 2-6 by constructing an additional public restroom to accommodate visitors recreating in the El Portal segment.

### **Segment 5: South Fork Merced above Wawona**

Recreational activities in this segment would remain limited to occasional overnight backpacking, day hiking, and stock-assisted pack trips. The finding of the Determination of Extent Necessary (Appendix L) for commercial use in wilderness would be implemented across the action alternatives.

### **Segments 6/7: Wawona and Wawona Impoundment**

The current range of visitor recreation activities would remain at Wawona. River-related activities would include swimming, fishing, boating, picnicking, camping, and education and interpretation at the History Museum. The Wawona impoundment would remain closed to visitor use due to water quality and safety concerns. Therefore, the summary of user capacity provided below pertains only to Segment 7, where the following actions would be common to Alternatives 2-6:

- Replace the existing public restroom facilities next to the Wawona Store with larger restrooms to accommodate visitor use levels.
- Increase the number of picnic tables to accommodate more picnicking near the Wawona Store.
- Redesign Wawona Store bus stop (for both tour buses and shuttles) with seating and sun cover to accommodate the current volume and types of use.
- Provide access to the Wawona Swinging Bridge on the south side of the river on public land, delineating a trail and formal access that includes restrooms, waste disposal, and parking.

### **Segment 8: South Fork Merced below Wawona**

Most use along this segment would remain swimming or hiking by day visitors. The NPS would continue to allow kayakers attempting the Class 5 multi-day adventure down the South Fork through the Sierra National Forest to put in below the Wawona Campground.

### ***Visitor Overnight Capacity***

Overnight capacity would be managed through ongoing permit and reservation systems. The Wilderness permit system would manage use in the backcountry, while the reservation systems would manage frontcountry camping and lodging accommodations.

### Segment 1: Wilderness above Nevada Fall

Backpack camping would continue at undesignated sites dispersed throughout the wilderness. (The alternatives would vary in whether or not facilities would be provided to support backpack camping.)

The zone capacities for Merced Lake, Washburn Lake, Mount Lyell and Clark Range zones would remain the same across Alternatives 2-6 (Table 8-9).

**TABLE 8-9: WILDERNESS ZONE CAPACITIES SEGMENT 1**

Wilderness Zones	Common to All Zonewide Capacity	Common to All Zone Capacity Specific to the River Corridor
Merced Lake Zone	50	50
Washburn Lake Zone	150	100
Mount Lyell Zone	50	10
Clark Range Zone	50	10
* <b>Note:</b> Little Yosemite Valley (LYV): The number of people in the LYV zone differs by alternative		

### Segment 2: Yosemite Valley

#### *Camping*

New walk-in campgrounds would be provided under Alternatives 2-6 west of the Backpackers Camp (16 sites) and east of Camp 4 (35 sites). These sites would partially offset the number of sites that would be removed under each alternative to restore ecological conditions (the number of which would differ among the alternatives). Common to Alternatives 2-6, two campsites would be removed from the Upper Pines Campground to protect cultural resources, and at the Lower Pines Campground, the loop road between sites 60 and 62 would be removed from the bed and banks of the river. The total amount of camping at all campgrounds would differ among the alternatives.

#### *Lodging*

Lodging at the Ahwahnee and the Wawona Hotel would remain at current levels under all the alternatives (123 units at the Ahwahnee and 104 units at the Wawona Hotel). Lodging at other locations would differ among the alternatives.

### Segment 3: Merced Gorge

No overnight accommodations would exist in this segment under any alternative.

### Segment 4: El Portal

No overnight visitor accommodations would exist in this segment under any alternative. Private overnight lodging located adjacent to the river and bounded by this segment would not be affected by any alternative as this lodging facility is on private land and is not regulated by the NPS.

### Segment 5: South Fork Merced above Wawona

Very little overnight use would occur in this segment. The wilderness zone capacities would remain the same across Alternatives 2-6 (Table 8-10).

**TABLE 8-10: WILDERNESS ZONE CAPACITIES-SEGMENT 5**

Wilderness Zones	Zone Capacity	Zone Capacity in River Corridor
South Fork Zone	150	15
Johnson Creek Zone	50	5
Chilnualna Creek Zone	100	0

### **Segments 6/7: Wawona and Wawona Impoundment**

The overnight capacity of the Wawona Hotel would remain the same at 104 rooms accommodating a maximum of 247 people per night. The capacity of the Wawona Campground would vary by alternative.

### **Segment 8: South Form Merced below Wawona**

No overnight use would occur in this segment.

### ***Visitor Day Use Capacity***

The following paragraphs discuss the management of visitor day use and user capacity, which were introduced in Chapter 5 (as part of the discussion of management standards for river values) and Chapter 6 (as part of the discussion of visitor use and user capacity). As noted in Chapter 6, the maximum number of day use visitors at one time in the river corridor would vary among the alternatives. However, the method for calculating the maximum number of day use visitors at one time would be the same under all the alternatives and is summarized below.

In Segment 2 (Yosemite Valley) and Segment 7 (Wawona), visitor day use capacities would be determined through a combination of day-use parking spaces for visitors arriving in private vehicles, and by the capacity of regional transit and commercial tour buses. In Segment 3 (Merced Gorge) and Segment 4 (El Portal), visitor day use capacities would be determined through the number of day-use parking spaces for visitors arriving by private vehicles. In Segments 2, 3, 4, and 7, visitor day use capacities also include people in vehicles circulating on park roads. In-park shuttles would facilitate visitor circulation within the Merced River corridor, but would not affect the number of people who could be in the corridor, or a specific segment of the corridor, at one time.

The only access to wild segments of the river corridor (Segments 1, 5, and 8) is via hiking trails, and the trailheads that provide access to these segments would remain located in Yosemite Valley (Segment 2) or Wawona (Segment 7).

A summary of user capacities by alternative is provided in the overview section of the alternatives descriptions in this chapter. The actions related to visitor day use capacity that would be common to Alternatives 2-6 are described below, by segment.

### **Segment 1: Wilderness above Nevada Fall**

The only access to this wild segment is via hiking trails, and the trailheads that provide access to this segment would remain located in Yosemite Valley (Segment 2). Transportation options for accessing the trailheads are included in the discussion of day use capacity for Yosemite Valley, below.

## Segment 2: Yosemite Valley

The day use capacity of Segment 2 would differ under the alternatives, depending on the amount of available day parking, but also some differences in regional transit service. Action related to visitor day-use parking under Alternatives 2-6 would include:

- Retain a total 15 day parking spaces for commercial tour buses near Yosemite Lodge, accommodating up to 720 people at one time in Yosemite Valley.
- Remediate the soils at the Wilderness parking lot, which was once a landfill for Curry Village and formalize parking with 190 spaces.
- Remove roadside parking from areas where parking does resource damage or is in conflict with ORVs. Specifically this includes 40 spaces along Cook's Meadow, 58 spaces along Sentinel Drive, 12 spaces along Village Drive, 20 spaces near Northside drive and the Curry 4-way, and 14 spaces between Big Oak Flat Road/El Portal Road intersection and El Portal Bridge.
- Redesign and formalize the existing parking lot at The Ahwahnee, providing for proper drainage. Construct an additional 50 parking space lot to the east of the existing parking lot. The parking lot at The Ahwahnee would be designed to accommodate the 50 spaces lost after a rock fall in 2009.

Under Alternatives 2-6, an East Yosemite Valley day-use parking permit system could be instituted whenever conditions reached the point where day use demand frequently exceeded available day parking for a particular alternative. Because day parking would be reduced under Alternatives 2-4, a day-use reservation system would need to be implemented immediately under these alternatives. Under Alternative 5 or 6, an East Yosemite Valley day-use parking permit system would be implemented whenever visitation to the East Yosemite Valley exceeded the parking availability and caused formal traffic diversions to be instituted at the El Capitan Crossover for 14 or more days during the summer season for two consecutive years (see Chapter 6). If implemented, the day-use parking permit system would require follow-on planning and environmental compliance, taking into account all of the following factors:

- **Seasonality** – The permit system would be instituted during the peak use summer season and during daylight hours only.
- **Allocation** – The system would ensure fair and equitable allocation of permits to all visitors on a mixed first-come, first-served and advanced reservation basis.
- **Distribution** – Permits would be available by multiple means including internet, telephone and in-person.
- **Permit Compliance** – Permits might be checked at either park entrance stations and/or on-site at day-use parking areas in the Valley.
- **Costs and Fees** – The permit system would need to address the costs of administration and whether fees would be required.
- **Thru Traffic and other Considerations** – The permit system would need to take into account the various types of day users to Yosemite Valley including administrative traffic, pass-thru travelers, special events and groups, etc. Similarly, development of the permit system would also need to account for the economic impacts (both positive and negative) to gateway communities.

Public transit options common to Alternatives 2-6 include:

- New public transit service between Fresno and Yosemite Valley would be established across the alternatives.

- Under Alternatives 2-6, the concession operated in-park shuttle services in Yosemite Valley and from Wawona to Yosemite Valley would remain. Additionally, a formal shuttle bus stop at El Capitan Meadow would be constructed in all alternatives and access to meadows would be formalized to address informal trail impacts.

### **Segment 3: Merced Gorge**

The day-use parking capacity in this alternative would continue to total 180 spaces at various roadside pull-out locations. This parking capacity would be consistent across Alternatives 2-6 and would accommodate up to 869 people at one time. No visitors would be delivered to this segment via public transit. This river segment is considered a “pass through” segment and therefore it would not contain any stops for passengers to enter or depart from transit services traveling through this corridor under Alternatives 2-6.

### **Segment 4: El Portal**

The visitor day-use parking capacity in El Portal would vary among the alternatives. However, because most visitors parking in the day parking spaces at El Portal would be expected to take shuttles into the park, under alternatives that increase visitor day-use parking in El Portal (Alternatives 4, 5, and 6), those visitors are counted as part of the day use calculations for Yosemite Valley and not for El Portal.

### **Segment 5: South Fork Merced above Wawona**

The only access to this wild segment is via hiking trails, and the trailheads that provide access to this segment would remain located in Wawona (Segment 7). Transportation options for accessing the trailheads are included in the discussion of day use capacity for Wawona, below.

### **Segments 6/7: Wawona and Wawona Impoundment**

The day parking capacity would remain 290 spaces across all actions alternatives, accommodating up to 911 people at one time. Roadside parking between the store and Chilnualna Falls Road would be removed across all action alternatives. Tour bus parking spaces would continue to be provided for eight buses accommodating up to 384 people at one time. The number of people arriving via regional transit would vary by alternative (from a low of 26 to a maximum of 311 people at one time).

### **Segment 8: South Fork Merced below Wawona**

The only access to this wild segment is via hiking trails, and the trailheads that provide access to this segment would remain located in Wawona (Segment 7). Transportation options for accessing the trailheads are included in the discussion of day use capacity for Wawona, below.

### ***Administrative Activities***

Administrative functions and facilities would generally be retained in their current locations under Alternatives 2-6, with some changes in housing capacity and office space allocations. All such activity would remain within the overall management and oversight of the NPS.

### Segment 1: Wilderness above Nevada Fall

Administrative uses in this segment would consist primarily of ranger patrols and backcountry utility work. These activities are seasonal in nature and minimal in comparison to visitor use and would not affect the overall user capacity.

### Segment 2: Yosemite Valley

Administrative uses would remain prevalent in this segment. No changes in NPS administrative facilities would be proposed under any alternative. The following changes in concessioner administrative facilities would be included in Alternatives 2-6.

- Remove the Concessioner Garage from the 100-year floodplain and relocate the NPS garage function to the historic Government Utility Building in the NPS Government Utility Area, which is outside the river corridor. Repair and towing services for the public that previously operated from the garage would be available in El Portal.
- Remove the Concessioner General Office Building and relocate the function to the Concessioner Warehouse Building (which would be expanded in Alternative 6).
- Visitor-use management program would ensure access for traditionally associated American Indians for participation in annually scheduled traditional and cultural events.

Conceptual site drawings have been completed for the relocation of the garage and the Concessioner General Office Building, to allow the analysis of impacts of these potential projects. See "Conceptual Site Drawings" at the end of the Actions Common to Alternatives 2-6 discussion for site details and design drawings.

### Segment 3: Merced Gorge

Only administrative use associated with the Arch Rock Entrance Station occurs in this segment. The associated residential use is described below.

### Segment 4: El Portal

Administrative uses would remain prevalent in this segment under Alternatives 2-6. This would include all administrative uses associated with the NPS Maintenance Facility. Existing uses would remain in their existing locations with the following exception:

- Remove the Odger's Bulk Petroleum Storage from its current location to facilitate valley oak habitat restoration; relocate this facility outside the river corridor.
- In consultation with traditionally associated American Indian tribes and groups, determine the best method for removing the aboveground abandoned infrastructure associated with CA-MRP-0181.

### Segments 6/7: Wawona and Wawona Impoundment

The NPS maintenance and administrative building complex within Segment 7 would be redesigned and improved under all the action alternatives, as follows:

- Construct a 4,500 square foot building and grounds maintenance facility, a 6,800 square foot combined structural and wildland fire station, and a 4,000 square foot roads maintenance facility to provide facilities to optimize operational efficiency.
- Rehabilitate the existing California Conservation Corp structures for potential reuse.

- Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer at the Wawona Maintenance Yard and restore native ecosystem. Provide a 150-foot wide restoration buffer.

### ***Coordination with Traditionally Associated American Indian Tribes and Groups***

The National Park Service would coordinate with traditionally associated American Indian tribes and groups to protect ethnographic resources:

- Implement best management practices to ensure continued coordination between traditionally associated American Indian tribes, groups, and traditional practitioners (through the Park American Indian Liaison) with law enforcement, fire management, interpretation, invasive species management, ecological restoration, and facilities management programs; include operational guidelines for material staging areas, parking, etc., to protect ethnographic resources.
- Assure access for traditionally associated American Indians for participation in annually scheduled traditional cultural events. In addition, assure tribal access for the personal conduct of traditional cultural practices through the Yosemite tribal fee waiver pass program.

### ***Employee Housing and Employee Parking***

#### **Segment 1: Wilderness above Nevada Fall**

The Merced Lake Ranger station and the Little Yosemite Valley trail crew and ranger camp would remain as temporary housing for employees working in this area. Rangers are stationed in this segment for 4-8 days at a time and these seasonal camps would continue to be used under all alternatives. There would be no permanent housing in this segment under any alternative.

#### **Segment 2: Yosemite Valley**

The existing employee housing for 164 NPS required occupants would be retained under Alternatives 2-6.

Under Alternatives 2-6 the temporary concessioner employee housing would be removed; the total housing provided for concessioner employees would differ among the alternatives, based on the visitor experience to be provided and the commercial services needed to support that experience. Under Alternatives 2-6, the following temporary concessioner employee housing would be removed:

- Curry Village: Remove temporary housing at Boys Town and Huff House housing.
- Yosemite Village: Remove Lost Arrow temporary housing
- Ahwahnee Hotel: Remove Ahwahnee tents
- Yosemite Lodge: Remove Thousand Cabins and Highland Court.

Under all alternatives, parking for administrative functions would be provided within the land assignments for these uses (adjacent to administrative buildings), where it would not compete with visitor parking spaces or conflict with visitor circulation patterns.



### **Segment 3: Merced Gorge**

The residential unit at the Arch Rock would continue to house up to 9 NPS employees under Alternatives 2-6. Minimal designated parking would continue to be available for exclusive employee and administrative use in this area and would not compete with visitor parking and access.

### **Segment 4: El Portal**

Additional employee housing would be developed in El Portal for concessioner employees under Alternatives 2-6. The amount and type of housing (high density vs. single-family homes) would differ among the alternatives. The following actions would be common to all the alternatives:

- Add infill units (duplexes) to the El Portal Village Center to accommodate up to 12 employees.
- Remove or relocate 36 existing private residences in the Abbieville/Trailer Village area to accommodate restoration and housing actions. The former footprints that are within the 150-foot riparian buffer would be ecologically restored. All new housing re-development would be outside the 100-year floodplain. Other redevelopment would be outside of the 150-foot riparian buffer.

### **Segment 5: Wilderness above Wawona**

No employee housing would be provided in this segment.

### **Segments 6/7: Wawona and Wawona Impoundment**

The existing NPS and concessioner employee housing in the Wawona community and elsewhere outside the river corridor would be retained.

### **Segment 8: South Fork below Wawona**

No employee housing would be provided in this segment.

## **Analysis of Facilities and Services**

Table 8-11 presents the park's assessment of the particular facilities and services that would be needed to support public use and/or to protect river resources based on the types, levels, and locations of use proposed across all the action alternatives. As an example, wayfinding to the Yosemite Village area from the primary parking area would be improved by removing and relocating both the Concession General Office building and the Yosemite Village Garage (shuttle and fleet maintenance facility) to a location outside the river corridor in Yosemite Valley. Additionally, an overall reduction in commercial services would occur across all alternatives, with services such as bike rentals, the Curry Village ice rink, and commercial horseback day rides eliminated. Additionally, existing development within 100 feet of the river are removed such as campsites in North Pines, Lower Pines, and Backpacker's Campgrounds as well as units within the ordinary high water mark at Housekeeping Camp. Finally, all temporary employee housing at Curry Village and the Yosemite Lodge would be removed.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds</b>			
Curry Pavilion and Food Service	Retained	<b>Yes:</b> This food service facility is necessary to support day visitors and those overnight visitors who are staying at lodging facilities without kitchenettes.	<b>No.</b> Food services are components of the overnight guest accommodations at this location. They are required to be located very near the overnight sleeping units.
Curry Village Grocery Store	Retained	<b>Yes:</b> This grocery provides visitors (as well as park residents) a limited range of merchandise including packaged and fresh groceries, sundries, and outdoor products that are frequently needed by campers and hikers, and day and overnight visitors.	<b>No.</b> Groceries are a component of overnight accommodations and need to be provided proximate to sleeping units
Curry Village Pizza Deck & Bar	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging facilities without kitchenettes. The Curry Village Pizza Deck and Bar serve casual dining lunch and dinner to lodging guests and many other visitors to Yosemite Valley.	<b>No.</b> Food services are components of the overnight guest accommodations at this location. They are required to be located very near the overnight sleeping units.
Curry Village Ice Rink	Service eliminated / facility removed	<b>No:</b> The ice rink at Curry Village, which has offered seasonal commercial ice skate rental and recreation in an outdoor setting within a closed loop ice creation facility, is not a vital visitor experience.	<b>N/A:</b> This service will be eliminated.
Commercial Horseback Day Rides in Yosemite Valley	Service eliminated	<b>No:</b> To date, the stable operations in Yosemite Valley provides seasonal commercial guided equestrian services for recreational use. This facility and service also supports the High Sierra Camp operations.	<b>N/A:</b> This service will be eliminated.
Curry Village Bike Rental	Service eliminated / facility removed	<b>No:</b> The bike rental operation at Curry Village is not a vital visitor service.	<b>N/A:</b> This service will be eliminated.
The Ahwahnee Rooms and Cottages	Retained	<b>Yes:</b> This National Historic Landmark is a significant contributing element of the Valley Historic ORV that cannot feasibly be relocated outside the corridor. Its retention in the river corridor is integral to protecting the historic ORV in this segment.	<b>No.</b> The Ahwahnee hotel is a National Historic Landmark within a historic district. It is not feasible to consider moving the hotel structure or the cottages in their entirety.
The Ahwahnee Bar & Food Service	Retained	<b>Yes:</b> This food service facility is necessary to support day visitors and those overnight visitors who are staying in the hotel.	<b>No.</b> Food services are a key component of the hotel. The existing bar, dining room and kitchen are located within the interior of the main hotel building and are not feasible to remove or relocate
The Ahwahnee Dining Room	Retained	<b>Yes:</b> This food service facility is necessary to support day visitors and those overnight visitors who are staying in the hotel.	<b>No.</b> Food services are a key component of the hotel. The existing bar, dining room and kitchen are located within the interior of the main hotel building and are not feasible to remove or relocate.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
The Ahwahnee Gift Shop	Retained	<b>Yes:</b> Located within the interior of the NHL, the gift shop offers a variety of gifts and souvenirs, consistent with the gift shop mission statement and the visitor experience goals of this alternative.	<b>No.</b> The Ahwahnee hotel gift shop is located within the interior of the hotel. It is not practical to consider moving it to an alternative location.
The Ahwahnee Sweet Shop	Retained	<b>Yes:</b> Located within the interior of the NHL, the gift shop offers a variety of gifts and souvenirs, consistent with the gift shop mission statement and the visitor experience goals of this alternative.	<b>No.</b> The Ahwahnee hotel Sweet Shop retail service is located within the interior of the hotel. It is not practical to consider moving it to an alternative location.
The Ahwahnee Swimming Pool	Removed	<b>No:</b> The hotel swimming pool is not integral to the Historic ORV or to the integrity of the hotel's National Historic Landmark Status. (Please confirm)	<b>No.</b> The Ahwahnee hotel swimming pool is a feature of the hotel.
The Ahwahnee Tennis Court	Removed	<b>No:</b> These are currently obsolete and have not been maintained since 2005.	<b>N/A:</b> This facility will be removed
The Ahwahnee Parking Lot	Retained	<b>Yes:</b> This parking lot is immediately outside the Ahwahnee hotel and is utilized by hotel guests.	<b>No.</b> This parking lot serves hotel guests. It would not be feasible to remove the parking lot near the hotel to an alternative outside the river corridor.
Boys Town Employee Housing Area	Re-located (to Huff House area)	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Huff House Employee Housing Area	Re-developed (with high-density housing)	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Ahwahnee Employee Dormitory	Retained	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Curry Village Employee Residence Area	Retained and reduced. Targeted removal of buildings in rock-fall zone will take place prior to MRP	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Happy Isles Nature Center	Retained	<b>Yes:</b> Serves as the primary interpretation & education center for visitors to east Yosemite Valley and the John Muir / Mist Trail. This facility is used by Nature Bridge as a winter classroom. Classroom activities revolve around the river water quality.	<b>Yes.</b> The services provided from this facility could be provided from an alternative outside of the river corridor if a suitable alternative location is identified. However, the river resource is currently an important component of activities taking place at this location.
Happy Isles Snack Stand	Removed	<b>No:</b> This facility, a mobile food service cart that provides limited food and beverages to visitors hiking the Vernal-Nevada Fall corridor, is not a vital visitor service.	<b>No.</b> There are not suitable locations for this service to be relocated to because the purpose is proximity to the Mist Trail, one of these most popular day hikes in Yosemite Valley and numerous visitors are under-prepared in terms of hydration.
Le Conte Memorial Lodge	Retained	<b>Yes:</b> This National Historic Landmark building is used by the Sierra Club for visitor interpretive and education programs. It is a significant contributing element of the Valley Historic ORV that cannot feasibly be relocated outside the corridor. Its retention in its historic location is integral to protecting the historic ORV in this segment.	<b>No:</b> The Le Conte Memorial Lodge is a National Historic Landmark that would not be feasible to relocate outside the river corridor. The services offered at this location could be relocated should an alternative site be identified.
Happy Isles Loop Road	Retained	<b>Yes:</b> This road is consistent with a recreational classification and is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that connects all major visitor service nodes. The bridge is also use by NPS for law enforcement and fire protection.	<b>No.</b> It is not feasible to relocate the existing roadway from its present location
Clark's Bridge	Retained	<b>Yes:</b> This vehicle/pedestrian/ bicycle bridge is consistent with a recreational classification and is needed to support public use of the river corridor. It allows for safe crossing of the Merced River and access to campgrounds and other points of interest in the east end of Yosemite Valley. Pedestrian and bicycle bridges protect riparian habitat from destruction caused by random crossings throughout the river corridor. The bridge is also use by NPS for law enforcement and fire protection.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Happy Isles Road Bridge	Retained	<b>Yes:</b> This vehicle/pedestrian/ bicycle bridge is consistent with a recreational classification and is needed to support public use of the river corridor. It allows for safe crossing of the Merced River and access to the John Muir Trailhead and the Mist Trail, and is part of the Yosemite Valley Loop Trail. The bridge supports the east Yosemite Valley shuttle bus route to Happy Isles and Mirror Lake and used by NPS for law enforcement and fire protection.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location
West of Backpackers Campground (New)	New Construction	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight accommodations that allow visitors to have a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size could accommodate this campground in Yosemite Valley.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp</b>			
Housekeeping Camp Bridge	Retained	<b>Yes:</b> Vehicle/pedestrian/ bicycle bridges are needed to support public use of the river corridor. They allow safe crossing of the Merced River and access to campgrounds and other points of interest in the east end of Yosemite Valley. Pedestrian and bicycle bridges also protect riparian habitat from destruction caused by random crossings throughout the river corridor.	<b>No.</b> This bridge could not be relocated outside the river corridor as it is a bridge across the Merced River. The bridge could be removed and foot traffic redirected to Stoneman and/or Sentinel bridges.
Concessioner General Office	Facility Removed and Service Re-located to Concessioner Maintenance and Warehouse Building, which is outside the river corridor	<b>Yes:</b> It is essential that most of the administrative, managerial and logistical support functions located in this facility remain centrally located in Yosemite Valley. As such there are adequate facilities outside of the river corridor that could, with interior modification, absorb these functions.	<b>Yes.</b> The services currently being performed in this facility could be relocated to alternate locations outside the river corridor.
Concessioner Garage	Facility Removed and Service Re-located to Government Utility Building, which is outside the river corridor	<b>Yes:</b> The concession operated garage is a critical component of the park operation. Services offered at the garage include: public automotive repairs; maintenance of park shuttle fleet(s); maintenance of the concession fleet; sales of automotive accessories (including snow chains); and dispatching of tow trucks. The park shuttle fleets are dispatched from a central office located at the garage.	<b>Yes.</b> It could be feasible to relocate some of the services provided at the existing garage to locations outside the river corridor, including shuttle fleet maintenance, public automotive repairs and concessioner fleet maintenance. Relocation of shuttle maintenance and public automotive repairs would be contingent upon identifying a suitable location outside the river corridor, but near primary visitor services to meet the operational needs of the shuttle service as well as visitors who may be without transportation while their vehicles are being repaired.
Concessioner Fire Station	Retained	<b>Yes:</b> Fire support services and apparatus are essential to provide for public health and safety and resource protection.	<b>No.</b> The concessioner fire station could not be relocated to an alternative location as its proximity to visitor services is inherent in its current siting.
Village Store	Retained	<b>Yes:</b> This grocery and retail facility is needed to support day use visitors, park residents and overnight visitors. It offers a limited range of merchandise including packaged and fresh groceries, sundries, and outdoor products frequently needed by campers and hikers.	<b>No.</b> The services offered at the Village Store could be not relocated outside the river corridor if a suitable location
Village Grill	Retained	<b>Yes:</b> This food service facility is necessary to support day visitors and those overnight visitors who are staying at lodging facilities without kitchenettes. The Village Grill serves a menu that is quickly prepared and modestly priced, and is convenient for visitors to Yosemite Village.	<b>Yes.</b> The services offered at the Village Grill could be relocated outside the river corridor if a suitable alternative location in Yosemite Village is identified.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp (cont.)</b>			
Village Sports Shop	Service eliminated and facility re-purposed	<b>No:</b> This service is a retail outlet that includes sales of recreational equipment, outdoor clothing, books and maps that pertain to park resources and activities, is not a vital visitor service.	<b>N/A:</b> This service will be eliminated.
Village Store Parking Lot	Expanded	<b>Yes:</b> A visitor parking area in this location is vital because it is proximate to the main visitor services core in Yosemite Valley, including major destinations like the Yosemite Valley Visitor Center, Wilderness Center, the Museum, Ansel Adams Gallery, and Degnan's Deli.	<b>No.</b> Parking facilities must be proximate to the Yosemite Village area.
Art Activity Center / Bank Building	Removed	<b>No:</b> This building, originally constructed to house the former branch office of the Wells Fargo Bank, now serves three purposes: (1) Yosemite Conservancy Art Activity Center, a visitor education opportunity, (2) cash operations for the primary concessioner, and (3) site of the Valley First Credit Union automated teller machine that serves local resident banking needs as well as dispensing cash to visitors who use debit and credit cards.	<b>N/A:</b> This facility will be removed and the services will be co-located within existing buildings.
Yosemite Valley Chapel	Retained	<b>Yes:</b> This is a historic structure that has been used as a place of non-denominational worship, and life events such as memorial services and wedding ceremonies in Yosemite Valley for many decades.	<b>No.</b> The Yosemite Valley Chapel is a historic structure located in its original site. Relocation would diminish its historic integrity to the degree that it would no longer meet the criteria for inclusion on the National Register of Historic Places.
Sentinel Crossover	Retained	<b>Yes:</b> This road is consistent with a recreational classification and is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that connects all major visitor service nodes.	<b>No.</b> This roadway segment services as a vital linkage between Northside and Southside Drives. Sentinel Bridge was constructed in 1990 to align with this roadway segment.
<b>Segment 2: Yosemite Lodge and Camp 4 Area</b>			
Camp 4 Campground	Retained	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight accommodations that allow visitors to have a direct outdoor experience.	<b>No.</b> Camp 4 is listed on the National Register of Historic Places and must remain in its current location to maintain its historic integrity.
Yosemite Lodge Swimming Pool and Snack Stand	Removed	<b>No:</b> The Yosemite Lodge pool has been operated as a public pool, open to Lodge guests as well as other patrons, including park employees and their dependents. The snack stand serves a very limited menu of quick serve refreshments. The pool and snack stand are not considered a vital visitor or community service.	<b>No.</b> These facilities are for Lodge guests and it would not be practical to relocate outside the river corridor.
Yosemite Lodge Nature Shop	Service eliminated and facility re-purposed as non-commercial use	<b>No:</b> This facility is a retail outlet that offers visitors a selection of nature themed gifts and souvenirs. It is not essential to support public use of the river corridor.	<b>No.</b> The building currently housing the Nature Shop is part of the Yosemite Lodge food service structure and would be infeasible to relocate.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Lodge and Camp 4 Area (cont.)</b>			
Yosemite Lodge Housekeeping/Maintenance	Relocated within the Lodge Complex	<b>Yes:</b> The Yosemite Lodge housekeeping and maintenance facility serves as the property-specific worksite from which visitor services, including daily room cleaning and maintenance operations for the entire complex, include food service and multi-purpose spaces (such as the Garden Terrace and the Cliff Room) are based. All lodging properties require some "back of the house" location for storage and staging.	<b>Yes.</b> The existing housekeeping and maintenance facilities could be relocated to an alternative location within the Yosemite Lodge complex
Yosemite Lodge Food Court	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging facilities without kitchenettes. The Yosemite Lodge Food Court is a high volume guest service available to Yosemite Lodge patrons, as well as day visitors and overnight users.	<b>No.</b> The building currently housing the Food Court is part of the Yosemite Lodge food service structure and would be infeasible to relocate.
Yosemite Lodge Post Office	Removed	<b>No:</b> This post office has operated as a satellite of the main Yosemite Post Office. (Note: prior to the 1997 flood, this post office served the employees who resided near Yosemite Lodge. Much of that housing has been removed from the area). This facility is no longer necessary.	<b>No.</b> This post office is no longer needed to serve visitors or employees in this area.
Yosemite Lodge Bike Stand	Service eliminated / facility removed	<b>No:</b> To date, the bike rental operation at the Yosemite Lodge offers seasonal commercial bicycle and accessibility device rental for unguided visitor recreation. This service is not a vital visitor service.	<b>N/A:</b> This service will be eliminated.
NPS Volunteer Office	Facility removed and service relocated outside the river corridor	<b>Yes:</b> Worksite assigned to NPS staff who manage the NPS volunteer program who play a vital role in various resource protection projects annually.	<b>Yes.</b> The administrative program managed from this facility could be relocated to a site outside the river corridor.
Swinging Bridge	Retained	<b>Yes:</b> This pedestrian foot bridge is consistent with a recreational classification and is needed to support public use of the river corridor. It allows for safe crossing of the Merced River and access to points of interest in Yosemite Valley. Pedestrian bridges protect riparian habitat from destruction caused by random crossings throughout the river corridor.	<b>No.</b> Swinging Bridge is part of the Valley pedestrian/bicycle corridor that provides access to important visitor destinations.
Superintendent's Footbridge	Retained	<b>Yes:</b> This pedestrian foot bridge is consistent with a recreational classification and is needed to support public use of the river corridor. It allows for safe crossing of the Merced River access to points of interest in Yosemite Valley. Pedestrian bridges protect riparian habitat from destruction caused by random crossings throughout the river corridor.	<b>No.</b> Under the current pedestrian and bicycle circulation system in Yosemite Valley, this bridge connects two segments of the bicycle path and provides a pedestrian link between Northside Drive and the chapel area.
Yosemite Lodge Parking Area (New)	New construction	<b>Yes:</b> Will serve as a visitor parking and queuing area during times of peak visitation to assist with reducing vehicle congestion on roadways. The parking area replaces approximately 35 roadside parking spaces adjacent to Cook's Meadow. It also is the primary tour bus parking for Yosemite Valley.	<b>No.</b> No alternative areas of sufficient size or location (i.e., proximity to Yosemite Falls trailhead, Wahoga, Camp 4 and the Yosemite Lodge) could accommodate this parking area.



**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Lodge and Camp 4 Area (cont.)</b>			
East of Camp 4 Campground (New)	New construction	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds provide overnight accommodations that allow visitors to have a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size or location (i.e., proximity to Camp 4 and the Yosemite Lodge) could accommodate this campground.
<b>Segment 2: West Yosemite Valley</b>			
El Capitan Cross-over	Retained	<b>Yes:</b> This road is consistent with a recreational classification and is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that provides a vital west Valley river crossing.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location
El Capitan Cross-over Bridge	Retained	<b>Yes:</b> This vehicle/pedestrian/ bicycle bridge is consistent with a recreational classification and is needed to support public use of the river corridor. It provides a vital west Valley river crossing. The bridge supports the west Yosemite Valley shuttle bus route to El Capitan Meadow and used by NPS for law enforcement and fire protection.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location
Pohono Bridge	Retained	<b>Yes:</b> This vehicle/pedestrian/ bicycle bridge is consistent with a recreational classification and is needed to support public use of the river corridor. It allows for safe crossing of the Merced River and access to the John Muir Trailhead and the Mist Trail, and is part of the Yosemite Valley Loop Trail. The bridge supports the east Yosemite Valley shuttle bus route to Happy Isles and Mirror Lake and used by NPS for law enforcement and fire protection.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location
<b>Segment 2: Utilities Across All of Segment 2</b>			
Utility Infrastructure	Retained	<b>Yes:</b> Consistent with a recreational classification. Water, wastewater, electrical and telecommunication systems provide necessary infrastructure to protect water quality, park resources, and human health & safety.	<b>No.</b> Utility systems serving facilities that will remain within the river corridor could not be relocated. If facilities within the river corridor are relocated, their utility system components could be removed.
<b>Segment 3: The Gorge</b>			
Arch Rock Entrance Station Kiosk	Retained	<b>Yes:</b> This facility serves as one of the five entry points to Yosemite National Park. It is necessary to have Park staff working at this facility to collect entrance fees and provide visitors with information.	<b>No.</b> The entrance station facility must be located along the El Portal Road in an area with sufficient sight distance for motorists traveling to and from Yosemite Valley to make safe stops to transact fee payments with park staff.
Arch Rock Housing (2 duplexes)	Retained	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs.	<b>Yes.</b> These workforce housing units could be relocated if satisfactory substitute housing is made available.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 3: The Gorge (cont.)</b>			
Arch Rock VUA Office	Retained	<b>Yes:</b> This administrative space provides vital safe operational space for employees who work at the Arch Rock Entrance Station.	<b>No.</b> This administrative space must be collocated with the entrance station.
Utility Infrastructure	Retained	<b>Yes:</b> Consistent with a scenic classification. Water, wastewater, electrical and telecommunication systems provide necessary infrastructure to protect water quality, park resources, and human health & safety.	<b>No.</b> Utility systems serving facilities that will remain within the river corridor could not be relocated. If facilities within the river corridor are relocated, their utility system components could be removed.
<b>Segment 4: El Portal</b>			
El Portal Administrative Complex	Retained	<b>Yes:</b> This facility houses wastewater treatment processing, large vehicle maintenance and fleet storage, shops for all maintenance operations; a central distribution point for supply, commissary, and warehouse operations, the park's emergency communications center and fire cache operation; and training, office, and critical administrative operations space for park operations. This facility is essential to support public use of the river corridor, public health and safety, and resource protection.	<b>No.</b> This facility houses key operational functions that could not be relocated unless a suitable alternative site is identified.
Rancheria Employee Housing Area (Existing)	Retained	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs, and to accommodate employees who provide resource protection services consistent with the mission of the National Park Service and current agency management policies.	<b>No.</b> This workforce housing could not be relocated unless a suitable alternative site is identified.
Old El Portal Employee Housing Area (Existing)	Retained	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs, and to accommodate employees who provide resource protection services consistent with the mission of the National Park Service and current agency management policies.	<b>No.</b> This workforce housing could not be relocated unless a suitable alternative site is identified.
Old El Portal Employee Housing Area (New)	Constructed	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs, and to accommodate employees who provide resource protection services consistent with the mission of the National Park Service and current agency management policies.	<b>No.</b> In-fill employee housing should occur within existing employee housing areas
El Portal Market and Gas Station Complex	Retained	<b>Yes:</b> Due to the concentration and number of employees living in El Portal, this is considered a vital community service.	<b>No.</b> These two concession operated services must be located along State Route 140. The service station requires considerable underground fuel distribution equipment that would be infeasible to relocate.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 4: El Portal (cont.)</b>			
Murchison House	Retained	<b>Yes:</b> This structure has been closed for many years pending an extensive renovation. However, it was most recently used as a park office facility.	<b>No.</b> This is a significant historic structure in El Portal and would lose its historic integrity if removed from this location.
El Portal Post Office	Retained	<b>Yes:</b> Due to the concentration and number of employees living in El Portal, this is considered a vital community service.	<b>No:</b> No suitable lands in size or proximity exist outside the river corridor. This service is a functional requirement for the number of employees living in this location.
El Portal Elementary School / High School	Retained	<b>Yes:</b> Due to the concentration and number of employees living in El Portal, this is considered a vital community service.	<b>No:</b> No suitable lands in size or proximity exist outside the river corridor. This service is a functional requirement for the number of employees living in this location.
NPS Offices in Old El Portal	Retained	<b>Yes:</b> This facility provides vital administrative space for park operations which support public use and resource protection efforts in the river corridor.	<b>No:</b> No suitable lands exist outside the river corridor, however, co-locating within the NPS maintenance complex would be desirable.
NatureBridge Office / Employee Housing Building	Retained	<b>Yes:</b> NatureBridge hosts multi-day environmental education programs in Yosemite for school children. This facility provides necessary employee housing and administrative space for this park partner organization.	<b>No:</b> This facility houses key operational functions, and workforce housing that could not be relocated unless a suitable alternative site is identified.
Carroll Clark Community Hall	Retained	<b>Yes:</b> Due to the concentration and number of employees living in El Portal, this is considered a vital community service.	<b>No:</b> No suitable lands in size or proximity exist outside the river corridor. This service is a functional requirement for the number of employees living in this location.
Mariposa County Pool at Rancheria Flat	Retained	<b>Yes:</b> Due to the concentration and number of employees living in El Portal, this is considered a vital community service.	<b>No:</b> No suitable lands in size or proximity exist outside the river corridor. This service is a functional requirement for the number of employees living in this location.
El Portal Fire Station	Retained	<b>Yes:</b> Fire support services and apparatus are essential to provide for public health and safety and resource protection.	<b>No:</b> No suitable lands in size or proximity exist outside the river corridor. This service is a functional requirement for the number of employees living in this location.
Motor Inn Cabins	Retained	<b>Yes:</b> Employees provide visitor services that are consistent with the types and amounts of use that are protective of ORV. These employees must live proximate to their work site.	<b>No.</b> This facility houses key operational functions that could not be relocated unless a suitable alternative site is identified.
AT&T Building	Retained	<b>Yes:</b> Serves as central distribution point for telecommunications network in El Portal. This telecommunication facility is necessary to support NPS's management and administration of the river corridor. This facility is also required for the transmission of microwave signals.	<b>No:</b> Due to transmission and receiving requirements of the system.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 4: El Portal (cont.)</b>			
Odger's Fuel Storage Facility	Removed	<b>Yes:</b> Provides bulk fuel storage vital to park operations serving utility infrastructure, back-up generators and heating / cooling systems for numerous visitor services.	<b>Yes:</b> Either a suitable location within park lands will be identified or a determination will be made that the service can be obtained outside the park.
Old Wastewater Treatment Plant	Removed	<b>No:</b> This facility has been obsolete for decades. A plan of action to remove abandoned infrastructure will be developed with American Indian groups.	<b>No.</b> A plan of action to address the abandoned infrastructure will develop in consultation with American Indian groups.
Utility Infrastructure	Retained	<b>Yes:</b> Consistent with a recreational classification. Water, wastewater, electrical and telecommunication systems provide necessary infrastructure to protect water quality, park resources, and human health & safety.	<b>No.</b> Utility systems serving facilities that will remain within the river corridor could not be relocated. If facilities within the river corridor are relocated, their utility system components could be removed.
<b>Segment 5 (Wild), Segments 6 &amp; 7 (Recreational), Segment 8 (Wild)</b>			
Wawona Hotel Lodging Units	Retained	<b>Yes:</b> This National Historic Landmark is a significant contributing element of the Wawona Historic ORV that cannot feasibly be relocated outside the corridor. Its retention in the river corridor is integral to protecting the historic ORV in this segment.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.
Wawona Hotel Restaurant	Retained	<b>Yes:</b> The restaurant is located inside the Wawona Hotel which is a National Historic Landmark. Food services are a necessary to support hotel guests. The nearest food services outside Wawona are located in Yosemite Valley, Fishcamp and Oakhurst.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.
Hill Studio Interpretation and Retail	Retained	<b>Yes:</b> The Hill Studio is a National Historic Landmark. It cannot feasibly be moved outside the river corridor and its retention in the river corridor is integral to protecting the historic ORV in this segment. It functions as a visitor contact station and sales outlet for the Yosemite Conservancy.	<b>No.</b> Hill Studio is listed on the National Register of Historic Place. Its location is integral to their historic significance that would be diminished by any relocation outside the river corridor.
Wawona Hotel Swimming Pool	Retained	<b>Yes:</b> The Wawona Hotel pool is open to hotel guests during peak periods only when weather conditions are favorable and reduces the number of people swimming in the river.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.

**TABLE 8-11. NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES – COMMON TO ALTERNATIVES 2-6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 5 (Wild), Segments 6 &amp; 7 (Recreational), Segment 8 (Wild) (cont.)</b>			
Wawona Maintenance Yard Complex	Retained and re-developed	<b>Yes:</b> This facility provides large vehicle and fleet storage, indoor, outdoor and shop spaces for necessary maintenance operations; fire, law enforcement, entrance station, campground reservation, and the wilderness operation administrative office space. The facility houses critically important park operation functions the absence of which would undermine NPS's ability to support public use of the river corridor, public health and safety, and resource protection.	<b>No.</b> This facility houses key operational functions that could not be relocated unless a suitable alternative site is identified.
Wawona Wastewater Treatment Plant	Retained	<b>Yes:</b> This facility provides wastewater treatment processing and water distribution monitoring. This facility is critically needed to support public use of the river corridor, public health and safety, and resource protection (by preventing discharge of untreated water into the Merced River).	<b>No.</b> This facility houses key operational functions that could not be relocated unless a suitable alternative site is identified.
Wawona Gas Station	Retained	<b>Yes:</b> Serves visitors and local residents. Provides vehicle fuel, limited automotive services such as tire repair, and snow chain sales/installation. The concessioner currently operates a tow truck from this site. This garage provides necessary support services to park employees and private citizens who own property within the river corridor in Wawona.	<b>Yes.</b> This facility could be relocated if a suitable alternative site is identified.
Wawona Store	Retained	<b>Yes:</b> This store is needed to support visitors, park employees, and private in-holders. It offers a limited range of merchandise including packaged and fresh groceries, sundries, and outdoor products frequently needed by campers, hikers and residents.	<b>Yes.</b> This facility could be relocated if a suitable alternative site is identified.
Pioneer History Center (Wawona)	Retained	<b>Yes:</b> This facility contains interpretive displays, historic structures and equipment used in NPS's living history programs. This facility interprets the history of the Wawona area for park visitors and thus supports public understanding of the history and resources in this portion of the river corridor.	<b>No.</b> This facility houses key operational functions that could not be relocated unless a suitable alternative site is identified.
Wawona Store Parking Lot	Retained	<b>Yes:</b> This is a parking facility immediately outside the Wawona Store	<b>Yes.</b> This facility could be relocated if a suitable alternative site is identified.
Utility Infrastructure	Retained	<b>Yes:</b> Water, wastewater, electrical and telecommunication systems provide necessary infrastructure to protect water quality, park resources, and human health & safety.	<b>No.</b> Utility systems serving facilities that will remain within the river corridor could not be relocated. If facilities within the river corridor are relocated, their utility system components could be removed.

## Conceptual Site Drawings

### *Parking along El Portal Road from the Big Oak Flat Road to Pohono Bridge*

The 0.6 mile road segment of El Portal Road from the intersection of the Big Oak Flat Road to Pohono Bridge currently contains a number of non-delineated, dirt roadside pullouts. Five of the larger pullouts are located on the south side of the road immediately adjacent to the Merced River, while one is located on the north side of the road just west of the intersection with Northside Drive and Southside Drive. The use of these dirt pullouts and associated informal trails on the south side of the road is causing erosion and vegetation trampling of the riverbank in some locations. Common to all of the action alternatives, four of the pullouts on the south side of the road would be paved and formalized to provide parking for a limited number of vehicles. These pull-outs would be curbed to prevent further encroachment towards the river and would accommodate up to 20 total vehicles with the remaining roadside and riverbank soils would be decompacted and restored to natural conditions. The largest pullout, located just east of the Big Oak Flat Road/El Portal Road intersection, would be removed and restored to natural conditions to avoid impacts to sensitive resources and to address safety concerns. The existing paved pullout on the north side of the road just west of the intersection with Northside/Southside Drive would also be formalized to accommodate 6 vehicles for a total parking capacity of 26 vehicles along this section of road. Curbing would be installed along the remaining south side road shoulder to prevent vehicles from creating additional informal pullouts, causing further resource damage. Of the 13 existing drainage culverts along this segment of the road, two would be removed and the remainder either retained or reconstructed in a manner that is consistent with their historic character and function.

### *NPS Government Utility Area*

The NPS Government Utility Area, located just north of Yosemite Village, is the primary location for Yosemite Valley utilities, park operations and maintenance. It consists of a large operations building and smaller outbuildings, maintenance yard, administrative fueling station, NPS stables, law enforcement and search and rescue headquarters. Eleven of the buildings and sheds are contributing elements to the Yosemite Valley Historic District. In order to improve circulation at the complex and to provide parking spaces for larger vehicles, six of the non-historic outbuildings would be removed or relocated as NPS operations are further consolidated within existing facilities in El Portal and structures are removed from the rock fall hazard zone. However, Law Enforcement operations and Valley Utilities would remain in their existing locations within the Government Utility Area. The current function of the Concessioner Garage, which is located in the 100-year floodplain, would be relocated to the historic Government Utility Building within the complex. Services would consist of light maintenance and repair for shuttle busses, tour buses, and concessioner vehicles. A new roads and trails maintenance building would be built which would house essential winter park operations equipment such as snow removal and sand spreading vehicles and equipment. The new building would include four (4) vehicle bays with support functions. All anticipated development activities and improvements would occur within the existing disturbed 4.75 acre site. Repair and towing services for the public that previously operated from the Concessioner Garage would be available in El Portal.

### ***Concessioner General Office***

The existing 18,000 square foot Concessioner General Office building located in Yosemite Village, just south of the Village Store parking lot would be removed under all alternatives to allow redesign and expansion of visitor parking, improved traffic and pedestrian circulation and resource restoration. The park has developed two alternatives that would allow the concessioner to redevelop existing facilities, but would establish a limit of approximately 14,000 square feet of replacement facilities. This would reduce office space, and therefore housing needs for approximately 15 concession employees in the valley.

### **Alternatives 2-5**

The office space would be replaced by reconfiguring the interior of the existing Concessioner Maintenance and Warehouse building located east of the NPS Government Utility Area. The existing structure would be updated to include office space on a mezzanine floor. In addition to this, nearby existing concessioner employee housing would be converted to office use. The residential needs of employees displaced from housing facilities would be accommodated in other buildings in Yosemite Valley.

Additional parking spaces for vehicles associated with the existing and relocated maintenance and warehousing operations, administrative vehicles and private vehicles used by employees would be expanded near the facility to accommodate the increased occupancy of the remodeled worksite. Specific locations being considered for parking include formalizing approximately 17 spaces along Village Drive, 6 to the northeast of the warehouse building, approximately 16 along Boulder Lane, approximately 15 spaces along the north side of Tenaya Way and an additional 15 spaces north of the existing auditorium. Development of parking spaces behind the auditorium would require the removal of one existing employee residence.

### **Alternative 6**

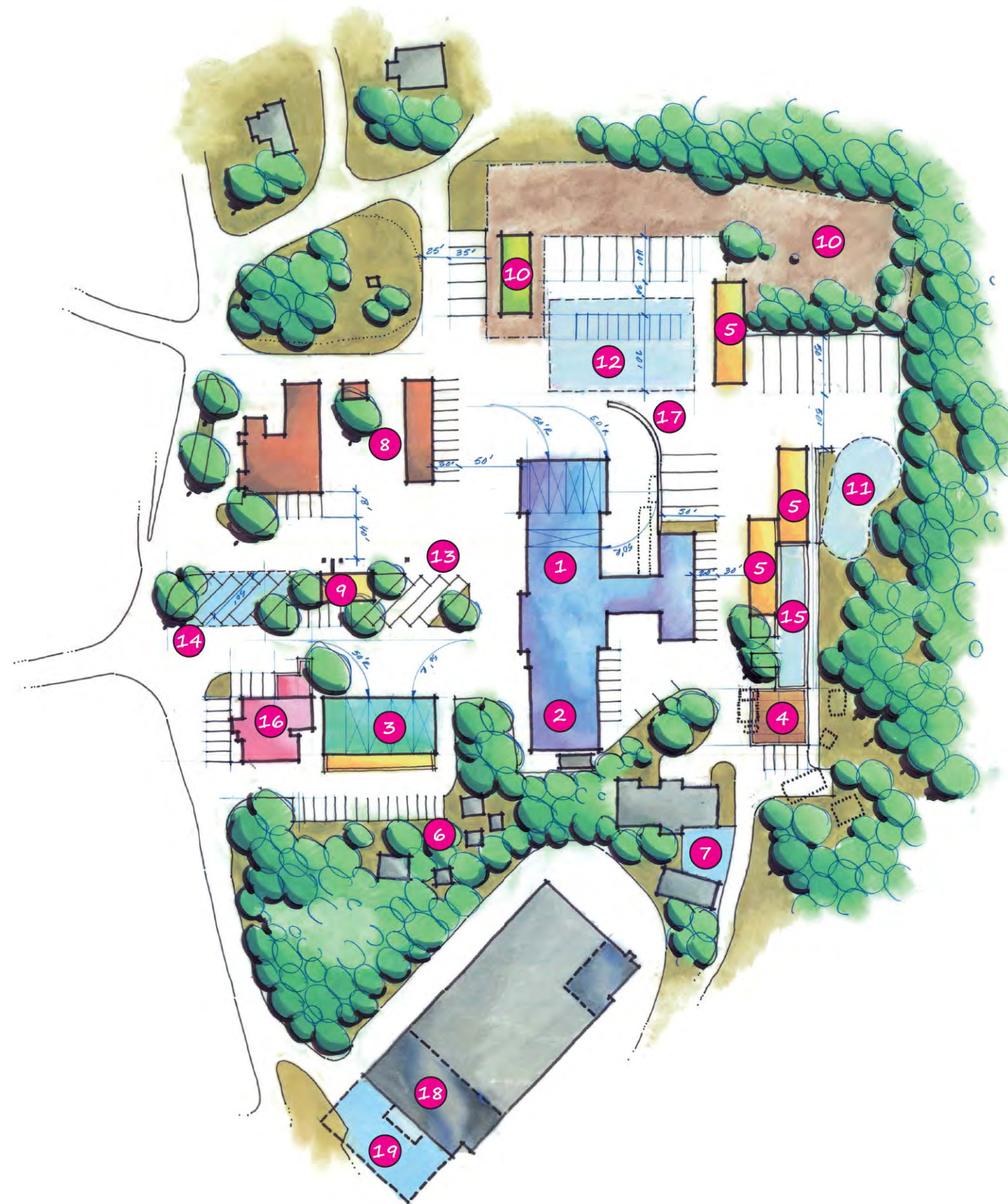
In Alternative 6, the office space would be replaced by reconfiguring the interior of the existing Concessioner Maintenance and Warehouse building located east of the NPS Government Utility Area. A 4,000 square foot addition to this building would also be constructed. The expansion of the building would require the elimination of 10 to 12 parking spaces that would be replaced nearby along Village Drive.

Additional parking spaces for vehicles associated with the existing and relocated maintenance and warehousing operations, administrative vehicles and private vehicles used by employees would be expanded near the facility to accommodate the increased occupancy of the remodeled worksite. Specific locations being considered for parking include formalizing approximately 17 spaces along Village Drive, 6 spaces to the northeast of the warehouse building, approximately 16 spaces along Boulder Lane, approximately 15 spaces along the north side of Tenaya Way and an additional 15 spaces north of the existing auditorium. Development of parking spaces behind the auditorium would require the removal of one existing employee residence.



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- 1 Relocate shuttle bus maintenance to existing service bays in the Government Utility Building.
- 2 Maintain NPS use and operation of historic Government Utility Building.
- 3 Construct a 4,500 square-foot building with light-duty service bays with administrative office space. Provide covered parking for road-clearing vehicles and equipment.
- 4 Relocate outdoor vehicle temporary storage yard.
- 5 Rehabilitate covered storage buildings for more efficient use.
- 6 Retain historic Camp 1 employee housing unit complex.
- 7 Construct a structural, load-bearing pad for emergency generator; improve access road.
- 8 Retain search and rescue operations.
- 9 Retain concessioner fueling station.
- 10 Retain NPS stables and corrals.
- 11 Maintain outdoor sand storage area for winter use.
- 12 Delineate flex parking and equipment staging area.
- 13 Delineate short-term, high-turnover shuttle bus parking spaces.
- 14 Provide additional shuttle bus parking or designated snow storage area.
- 15 Outdoor storage area to be re-organized and improved.
- 16 Maintain utility building use with park partner.
- 17 Reconstruct retaining wall to provide for bus access to existing bay door.
- 18 Construct a 10,000 square-foot mezzanine in the existing Concessioner Maintenance Building and Warehouse. Relocate Concessioner General Office from Yosemite Village Day-use Parking Area; Alternatives 2, 3, 4 and 5 only.
- 19 Construct a 4,000 square-foot office addition to the Concessioner Maintenance Building and Warehouse for Concessioner General Office use; Alternative 6 only.



**Alternatives 2,3,4,5,6**  
**Conceptual Site Drawing for**  
**Yosemite Valley Maintenance Area**  
 Yosemite National Park  
 United States Department of the Interior • National Park Service

\*These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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## **ALTERNATIVE 2: SELF-RELIANT VISITOR EXPERIENCES AND EXTENSIVE FLOODPLAIN RESTORATION**

### **Overview**

The guiding principles of Alternative 2 would include maximizing the restoration of the 100-year floodplain by removing infrastructure not essential to resource-related recreation, and creating a more self-reliant visitor experience, where fewer commercial services would be available. Visitor-use levels would be managed to allow for visitor experiences free of crowding or congestion.

Management actions in Alternative 2 would:

- Restore 347 acres of meadow and riparian habitat.
- Slightly reduce the available campsites in all river segments (-8%) and in Yosemite Valley (-3%).
- Significantly reduce the available lodging in all river segments (-43%) and in Yosemite Valley (-46%).
- Reduce day-use parking spaces in Yosemite Valley (-23%).
- Reduce commercial services.
- Make significant changes to traffic-circulation patterns in Yosemite Valley to accommodate ecological restoration goals and reduce traffic congestion.
- Accommodate approximately 13,900 visitors per day in East Yosemite Valley.
- Continue to manage overnight use through wilderness permit system and a reservation system for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through parking permit system required during peak summer season.

### ***Actions to Protect and Enhance River Values***

Alternative 2 would protect and enhance river values through major ecological restoration to enhance the connectivity of the river to its floodplain. It would prioritize enhancement of ecological river values, including large portions of the 100-year floodplain, dynamic areas of the 10-year floodplain in East Yosemite Valley, and corridorwide riparian and meadow habitat, over the retention of existing infrastructure and circulation patterns. In addition to actions common to the other action alternatives, it would ecologically restore the areas currently occupied by the Merced Lake High Sierra Camp, campsites and lodging units in Yosemite Valley, the Wawona Golf Course, and the Concessioner Stables, and it would create a large valley oak habitat protection area. The free-flowing condition of the river would be enhanced by removing three bridges within the bed and banks of the river that constrict flow during high-water events. Hydrologic connectivity of meadows to the riparian floodplain would be enhanced through the removal of certain road segments that bisect meadows.

Cultural and scenic values would be protected and enhanced as described under “Actions Common to Alternatives 2-6” (beginning on page 8-53). Recreational values would be protected and enhanced through the removal of the Merced Lake High Sierra Camp, and by improving visitor circulation and reducing crowding in Yosemite Valley. Table 8-12 provides a summary of the actions that would occur under Alternative 2 to protect and enhance river values.

**TABLE 8-12: ADDITIONAL ACTIONS TO PROTECT AND ENHANCE RIVER VALUES, ALTERNATIVE 2**

<b>Ecological Restoration Actions (Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values)</b>	
<b>Corridorwide</b>	
<b>Ecological Restoration Acreage</b>	164 acres (common to all) plus an additional 183 acres (refer to Appendix E for specific locations)
<b>Riprap to be Removed</b>	5,700 linear feet (common to all) plus an additional 964 feet (refer to Appendix E for specific locations)
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore the Merced Lake High Sierra Camp.</li> </ul>
<b>Segment 2: Yosemite Valley</b>	
<b>Free Flow / Geologic/Hydrologic Values</b>	<ul style="list-style-type: none"> <li>Remove Ahwahnee, Sugar Pine, and Stoneman Bridges to enhance the free-flowing condition of the river.</li> </ul>
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore 35.6 acres of floodplain at former Upper and Lower River Campgrounds.</li> <li>Move Yosemite Village Day-use Parking Area parking north outside the 10-year floodplain.</li> <li>Ecologically restore 25 acres of 100-year floodplain at the North Pines Campground, Backpackers Campground, Yellow Pine Administrative Campground, and portions of Lower Pines campground.</li> <li>Ecologically restore large areas of Yosemite Lodge and Housekeeping Camp,</li> <li>Ecologically restore Concessioner Stables, Ahwahnee Row, and Tecoya housing area.</li> </ul>
<b>Meadow Restoration</b>	<ul style="list-style-type: none"> <li>Remove 900 feet of Northside Drive through Ahwahnee Meadow to enhance connectivity of the meadow and floodplain.</li> <li>Remove 1,335 feet of Southside Drive through Stoneman Meadow to enhance connectivity of the meadow and floodplain.</li> </ul>
<b>Segment 7 : Wawona</b>	
<b>Meadow Restoration</b>	<ul style="list-style-type: none"> <li>Ecologically restore the 42-acre Wawona Golf Course to meadow habitat.</li> </ul>
<b>Recreational Values</b>	
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Wilderness Recreation</b>	<ul style="list-style-type: none"> <li>Enhance wilderness character by removing the Merced Lake High Sierra Camp and converting this area to designated Wilderness.</li> <li>Reduce zone capacities and convert overnight use to dispersed camping</li> </ul>

### *User Capacity, Land Use, and Facilities Management*

Alternative 2 would focus on providing a more self-reliant visitor experience, with a marked reduction in commercial services and facilities. As a result of this focus on self-reliance, as well as the goal of extensive floodplain restoration, the overall visitor use levels would be lower than current use levels to allow for increased resource restoration and for reduced crowding and congestion in the most popular areas of the river corridor. Table 8-13 provides a summary of user capacities by use type and location.

**TABLE 8-13: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 2**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 2	
	Unit Type	Units	People	Units	People
<b>Wilderness Above Nevada Fall</b>					
Visitor Overnight Use	Zone Capacities & Beds	380	380	195	195
Visitor Day Use	Day Hikers	350	350	350	350
Employee Housing	Employee Beds	15	15	5	5
Administrative Day Use	People on Day Patrols	5	5	5	5

**TABLE 8-13: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 2**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 2	
	Unit Type	Units	People	Units	People
<b>Yosemite Valley</b>					
Visitor Overnight Use	Rooms & Sites	1,500	6,564	1,006	4,758
Visitor Day Use	Parking Spaces & Buses		8,272	-	6,819
Employee Housing	Employee Beds	1,315	1,315	658	658
Administrative Day Use	Parking Spaces	166	332	166	332
<b>Merced Gorge</b>					
Visitor Overnight Use	Rooms & Sites	-	-	-	-
Visitor Day Use	Parking Spaces	180	869	180	869
Employee Housing	Employee Beds	9	9	9	9
Administrative Day Use	Parking Spaces	2	4	2	4
<b>El Portal</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	214	740	214	740
Employee Housing	Employee Beds	192	192	618	618
Administrative Day Use	Parking Spaces	610	1,220	610	1,220
<b>South Fork Above Wawona</b>					
Visitor Overnight Use	Zone Capacities	20	20	20	20
Visitor Day Use	Day Hikers	6	6	6	6
Employee Housing	Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1
<b>Wawona</b>					
Visitor Overnight Use	Rooms & Sites	203	865	171	673
Visitor Day Use	Parking Spaces & Buses	-	1,295	-	1,321
Employee Housing	Beds	121	121	121	121
Administrative Day Use	Parking Spaces	30	60	30	60
<b>South Fork Below Wawona</b>					
Visitor Overnight Use	Zone Capacities	3	3	3	3
Visitor Day Use	Day Hikers	3	3	3	3
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1

## Visitor Overnight Capacity

### Camping

The campsite inventory in the Merced Wild and Scenic River corridor, including Yosemite Valley, would be reduced by approximately 8% as a result of natural and cultural resource protection measures. All campsites within the 100-year floodplain would be removed. Campsite losses would be offset by the addition of new walk-in camping at a redeveloped Yosemite Lodge, east of Camp 4 Campground, and west of Backpackers Campground. Under Alternative 2, the total number of campsites in Yosemite Valley would be 450 sites, and the total number of campsites available in the corridor would be 521 sites. Table 8-14 provides a summary of the proposed changes to camping and the reasons for those proposed changes.

**TABLE 8-14: CAMPING FACILITIES- ALTERNATIVE 2**

Existing Locations	Alt 1 (No Action)	Alt 2	Details
Backpackers	25 sites	0 sites	25 walk-in sites removed from the 100-year floodplain, some of which will be relocated west of Backpackers
Camp 4	35 sites	35 sites	No change to this National Historic Register Site
Lower Pines	76 sites	44 sites	32 sites removed from the 100-year floodplain
North Pines	86 sites	0 sites	86 sites removed from the 100-year floodplain
Upper Pines	240 sites	216 sites	22 sites removed from the 100-year floodplain and 2 sites for cultural resource concerns
Yellow Pine Administrative	4 sites	0 sites	4 group administrative sites removed from the 100-year floodplain
Wawona Campground	99 sites	67 sites	32 sites removed from the 100-year floodplain or in culturally sensitive areas
<b>Total Existing Locations</b>	<b>565 sites</b>	<b>362 sites</b>	
New Locations	Alt 1 (No Action)	Alt 2	Details
West of Backpackers	0 sites	16 sites	16 walk-in sites relocated from Backpackers Camp to less sensitive area outside 100-year floodplain
East of Camp 4	0 sites	35 sites	35 walk-in sites constructed in area east of Camp 4
Yosemite Lodge walk-in	0 sites	104 sites	100 walk-in sites and 4 group sites constructed
Abbieville / Trailer Court	0 sites	4 sites	4 group administrative sites constructed in El Portal to replace Yellow Pine administrative sites
<b>Total New Camping</b>	<b>0 sites</b>	<b>159 sites</b>	
<b>Total Camping in Corridor</b>	<b>565 sites</b>	<b>521 sites</b>	

### Lodging

In-park lodging availability would be reduced by approximately 43% as compared to existing conditions. Management actions related to lodging would focus on removing lodging from the 100-year floodplain at Yosemite Lodge and Housekeeping Camp, and in Wilderness. New hard-sided lodging would be constructed in Curry Village to offset the loss of year-round accommodations at Yosemite Lodge. As a result of these actions, the in-corridor lodging inventory would be reduced from 1,160 units to 660 units. Table 8-15 provides a summary of the proposed changes to lodging and the reasons for those proposed changes.

**TABLE 8-15: LODGING FACILITIES- ALTERNATIVE 2**

Wilderness	Alt 1 (No Action)	Alt 2	Details
Merced Lake High Sierra Camp (MLHSC)	60 beds (22 units)	0 beds	Remove all infrastructure and expand dispersed camping into re-purposed MLHSC area
Yosemite Valley	Alt 1	Alt 2	Details
Ahwahnee Hotel	123 rooms	123 rooms	No change at this National Historic Landmark
Housekeeping Camp	266 tent cabins	0 tent cabins	Remove all units from 100-year floodplain
Curry Village	400 units	433 units (290 tents and 143 hard-sided units)	<ul style="list-style-type: none"> <li>Retain 290 tents</li> <li>Retain 47 hard-sided cabin-with-bath units</li> <li>Retain 18 units at Stoneman House</li> <li>Construct 78 hard-sided units in Boys Town</li> </ul>
Yosemite Lodge	245 rooms	0 rooms	Remove entire lodging complex, including those units in the 100-year floodplain
Wawona	Alt 1	Alt 2	Details
Wawona Hotel	104 rooms	104 rooms	No change at this National Historic Landmark
<b>Total Lodging in Corridor</b>	<b>1,160 units</b>	<b>660 units</b>	
<b>* El Portal:</b> Private accommodations exist but are not on NPS land; therefore, they are not listed here			



## Visitor Day Use Capacity and Access Improvements

Day-use parking capacity in Yosemite Valley would be reduced by 23% compared to current levels. Day-use capacity would be actively managed and potentially restricted during peak use season (May through September). A day use permit system would be implemented in this alternative for East Yosemite Valley during the peak summer season. Table 8-16 provides a summary of the total number of day-use parking spaces for each segment of the corridor where parking occurs.

**TABLE 8-16: NUMBER OF DAY-USE PARKING SPACES BY SEGMENT, ALTERNATIVE 2**

Location	Alt 1 (No Action)	Alt 2
Segment 2: Yosemite Valley	2,337 spaces	1,800 spaces
Segment 3: The Gorge	180 spaces	180 spaces
Segment 4: El Portal	214 spaces	214 spaces
Segment 7: Wawona	290 spaces	290 spaces
<b>Total Parking</b>	<b>3,021 spaces</b>	<b>2,484 spaces</b>

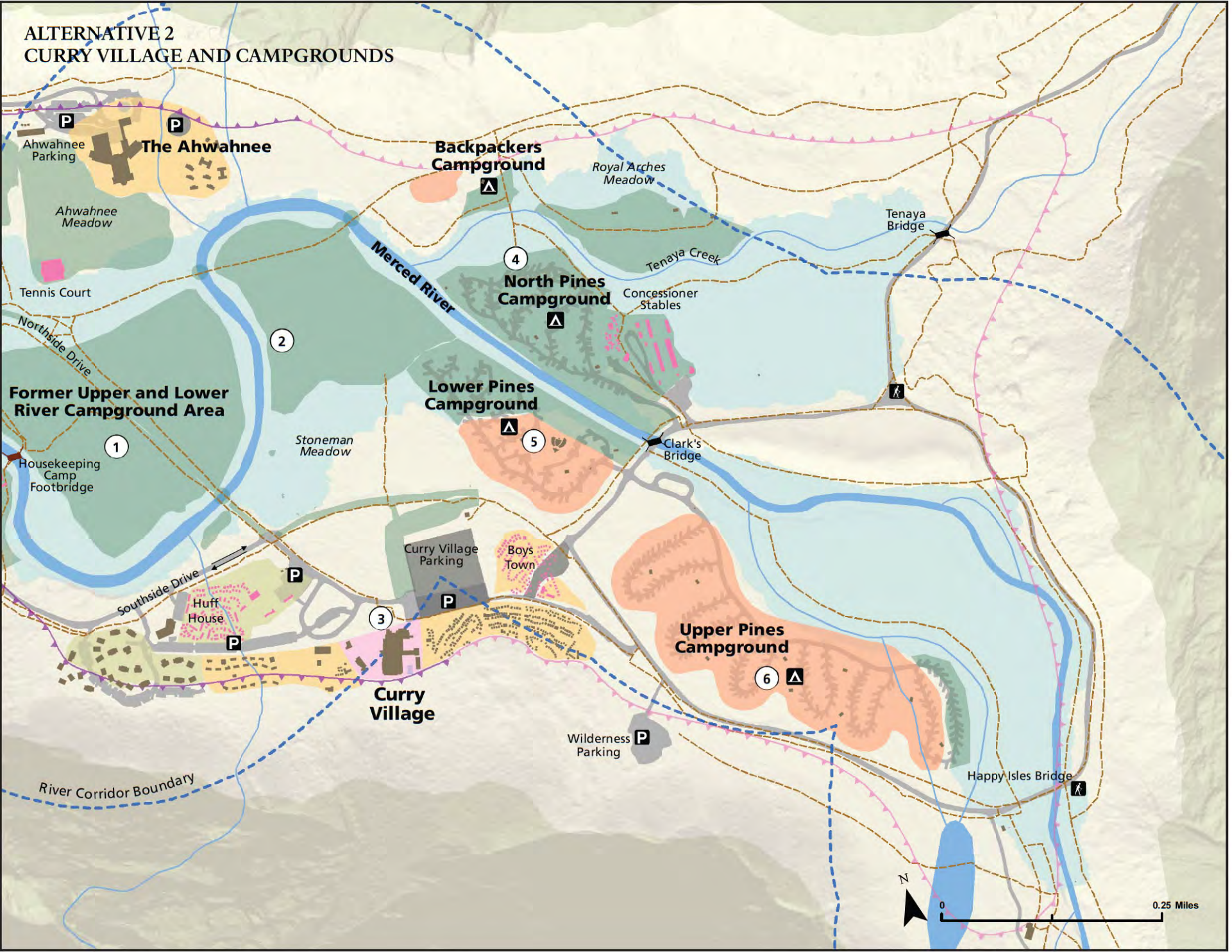
The most significant changes to parking and traffic circulation would take place in the vicinity of the Yosemite Village Day-use Parking Area and Yosemite Lodge. Day-use visitors would park at a redesigned parking area at Yosemite Village Day-use Parking Area, with a total of 550 parking spaces. At Yosemite Lodge, proposed changes include a new day-use parking area north of the core visitor service area, and additional overnight parking west of Yosemite Lodge to serve new camping areas. Total parking for East Yosemite Valley (including day, overnight, and administrative uses) would be approximately 4,000 spaces.

Transit services would remain unchanged on the Highway 140, Highway 120 West and Highway 120 East corridors; one round-trip run per day would be added to the Highway 41 corridor. All within-park shuttle services would remain the same, and the East Valley shuttle would decrease shuttle intervals to 5 minutes.

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# ALTERNATIVE 2: SELF-RELIANT VISITOR EXPERIENCES AND EXTENSIVE FLOODPLAIN RESTORATION



## EAST YOSEMITE VALLEY: CURRY VILLAGE AND CAMPGROUNDS

- 1. Former Upper and Lower River Campground Area**
  - Ecological Restoration: Restore 35.6 acres of floodplain habitat within the 10-year floodplain. Restore natural floodplain topography by removing remaining asphalt and re-establishing seasonal channels, and revegetate with native plants. Remove Lower River amphitheater. Temporarily fence restoration areas to allow for recovery.
- 2. River Reach between Bridges**
  - Ahwahnee and Sugar Pine Bridges: Remove the Ahwahnee and Sugar Pine Bridges (and associated berm) to enhance the free-flowing condition of the river. Restore area to natural conditions. Re-route the multiple-use trail north of the river.
  - Stoneman Bridge: Remove Stoneman Bridge to enhance free-flowing condition of the river. Restore area to natural conditions. Reconfigure part of Southside Drive as a two-way road, remove the road segment through Stoneman Meadow, and redesign intersection at Sentinel and Southside Drive.
- 3. Curry Village Area**
  - Ecological Restoration: Remove Southside Drive through Stoneman Meadow to enhance the hydrologic connectivity of the meadow. Re-align road through the Boys Town area to facilitate restoration of Stoneman meadow. Extend meadow boardwalk (up to 275 feet) to Curry Village.
  - Lodging: Total would be 433 guest units, including: 290 tents in Curry Village retained; 78 hard-sided units constructed in Boys Town; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.
  - Curry Orchard Parking Area: Re-design the Curry Orchard parking area to formalize 420 parking spaces. Re-design will incorporate best management practices to increase hydrologic flows into Stoneman Meadow and protect water quality. Remove apple trees to mitigate human-bear interactions, and plant native vegetation.
- 4. North Pines Campground Area**
  - North Pines Campground: Remove all 86 campsites in the 100-year floodplain and restore to native floodplain/riparian habitat.
  - Backpackers Campground: Remove all 25 walk-in sites in the campground, of which 21 are within the 100-year floodplain. Partially replace with a new campground with 16 walk-in sites west of Backpackers Campground.
  - Concessioner Stables: Ecologically restore the stables area, located within the 100-year floodplain. Remove associated housing (25 beds).
- 5. Lower Pines Campground Area**
  - Campground Sites: Retain 44 campsites and remove 32 campsites within the 100-year floodplain.
- 6. Upper Pines Campground Area**
  - Campground Sites: Retain 216 campsites. Remove 22 sites to restore the 100-year floodplain and an additional two sites to protect cultural resources.

## Legend

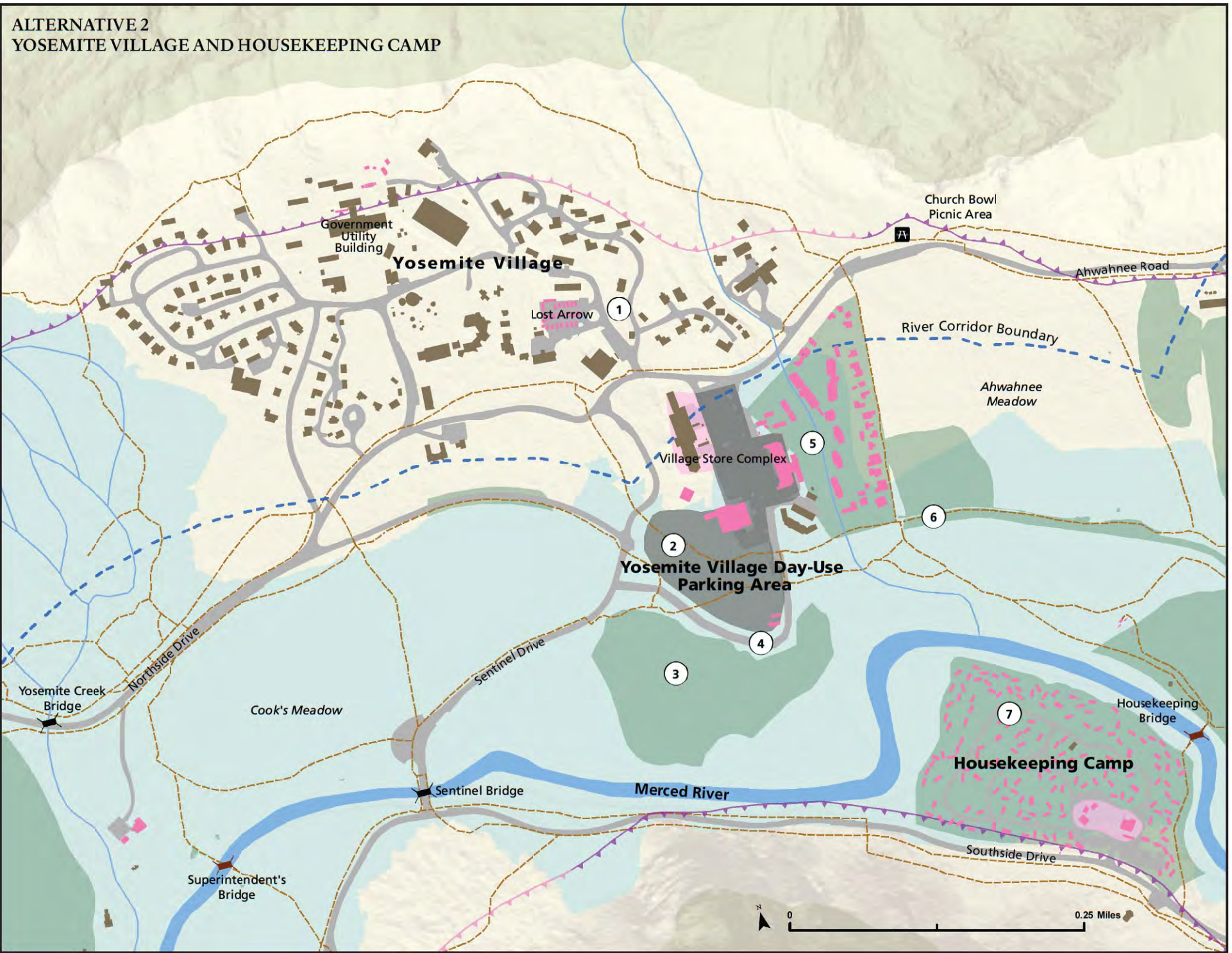
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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# ALTERNATIVE 2: SELF-RELIANT VISITOR EXPERIENCES AND EXTENSIVE FLOODPLAIN RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE VILLAGE AND HOUSEKEEPING CAMP

1. Lost Arrow: Remove temporary employee housing. Re-establish an administrative parking lot to accommodate 50 spaces.
2. Yosemite Village Day-use Parking Area: Move the parking area day-use parking northward outside of the dynamic 10-year floodplain. Formalize the Yosemite Village Day-use Parking Area using best management practices to protect water quality to accommodate 550 parking places.
3. Floodplain and Riparian Ecological restoration at Yosemite Village Day-use Parking Area: Remove fill material and restore meadow and floodplain habitat within the dynamic 10-year floodplain.
4. Pedestrian/Vehicle Conflicts: Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area. Consolidate parking to the north of the road and provide walkways leading to Yosemite Village separating vehicle and pedestrian traffic and eliminating conflicts and associated traffic congestion. Re-designed traffic circulation patterns would not require roundabouts or pedestrian road crossings.
5. Indian Creek Restoration: Remove housing and development in the 100-year floodplain between Village Store and Ahwahnee Meadow. Recontour topography, restore stream hydrology, decompact soils, and plant native meadow vegetation.
6. Ahwahnee Meadow Restoration: Remove 900 feet of road through Ahwahnee Meadow and relocate the bike path to the south, restoring hydrologic connectivity between the meadow and river. Re-route the formal foot trail in Ahwahnee Meadow so it does not pass through wetlands. Restore meadow topography and native vegetation in original trail corridor.
7. Housekeeping Camp Lodging: Restore the 100-year floodplain to natural conditions. Remove all 266 lodging units and amenities including shower houses, laundry, office, and grocery store. Convert area to day-use river access point and picnic area. Retain one restroom for day users. Restore 16.8 acres of floodplain and riparian ecosystem.

## Legend

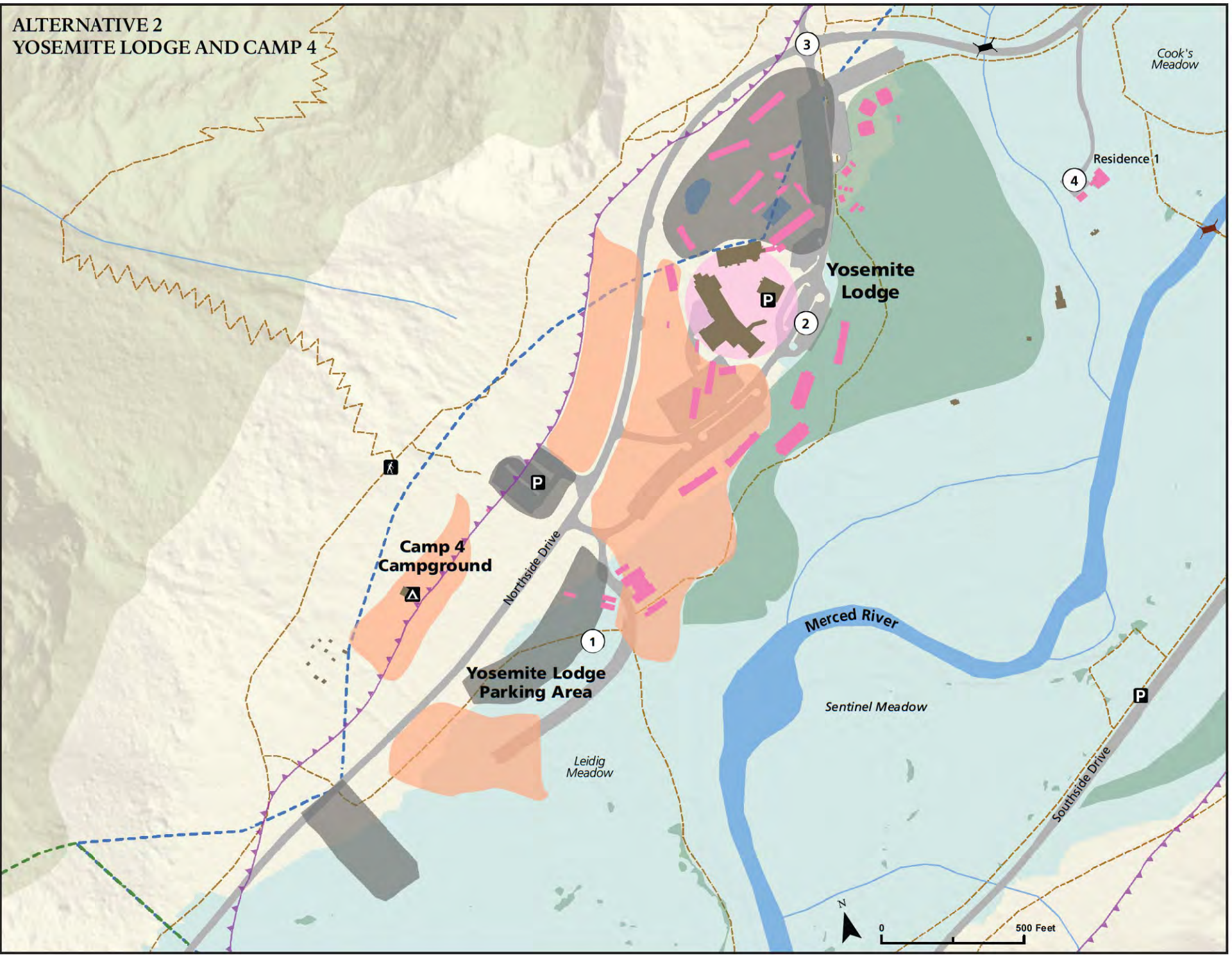
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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# ALTERNATIVE 2: SELF-RELIANT VISITOR EXPERIENCES AND EXTENSIVE FLOODPLAIN RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE LODGE AND CAMP 4

- 1. West of Yosemite Lodge**
  - Parking:** Construct 150 new parking spaces southwest of Yosemite Lodge. This includes 15 spaces for tour bus parking. Parking re-development will incorporate best management practices to protect water quality.
- 2. Yosemite Lodge Area**
  - Yosemite Lodge Re-development:** Remove the 245 existing lodging units at Yosemite Lodge. Re-purpose the area for day-use parking, a day lodge, food service, and camping and restore major portion of the 100-year floodplain.
  - Ecological restoration:** Restore riparian and floodplain ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate one service road to the well house and parking. Remove non-native fill, decompact soils and plant riparian plant species (10.9 acres).
  - Camping:** Construct 100 new walk-in campsites and four group sites in former Yosemite Lodge site.
  - Day-Use Parking:** Add 250 day-use parking spaces in the Yosemite Lodge area. Parking re-development will incorporate best management practices to protect water quality.
  - Services and Facilities:** Convert to day-use and retain core visitor services. Retain the food court. Re-purpose the Mountain Room dining service and bar areas as a day lodge. Re-purpose the convenience shop and nature shop. Remove the NPS Volunteer Office, post office, swimming pool, bike rentals, and snack stand.
  - Concessioner Housing:** Remove housing at Highland Court and at the Thousands Cabins (as listed under actions common to all alternatives). No new housing would be constructed in its place.
- 3. Yosemite Falls Intersection**
  - Traffic Congestion:** Move the pedestrian crossing between Yosemite Lodge and Yosemite Falls to an on-grade (street level) pedestrian crossing west of the intersection of Northside Drive and Yosemite Lodge Drive to alleviate traffic congestion created by pedestrian/vehicle conflicts.
- 4. Residence 1**
  - Residence 1:** Relocate this historic structure, also known as the Superintendent's House, to the NPS housing area and rehabilitate the building per the Secretary of Interior's Standards for the Treatment of Historic Properties and the Historic Structures Report. Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.

**Legend**

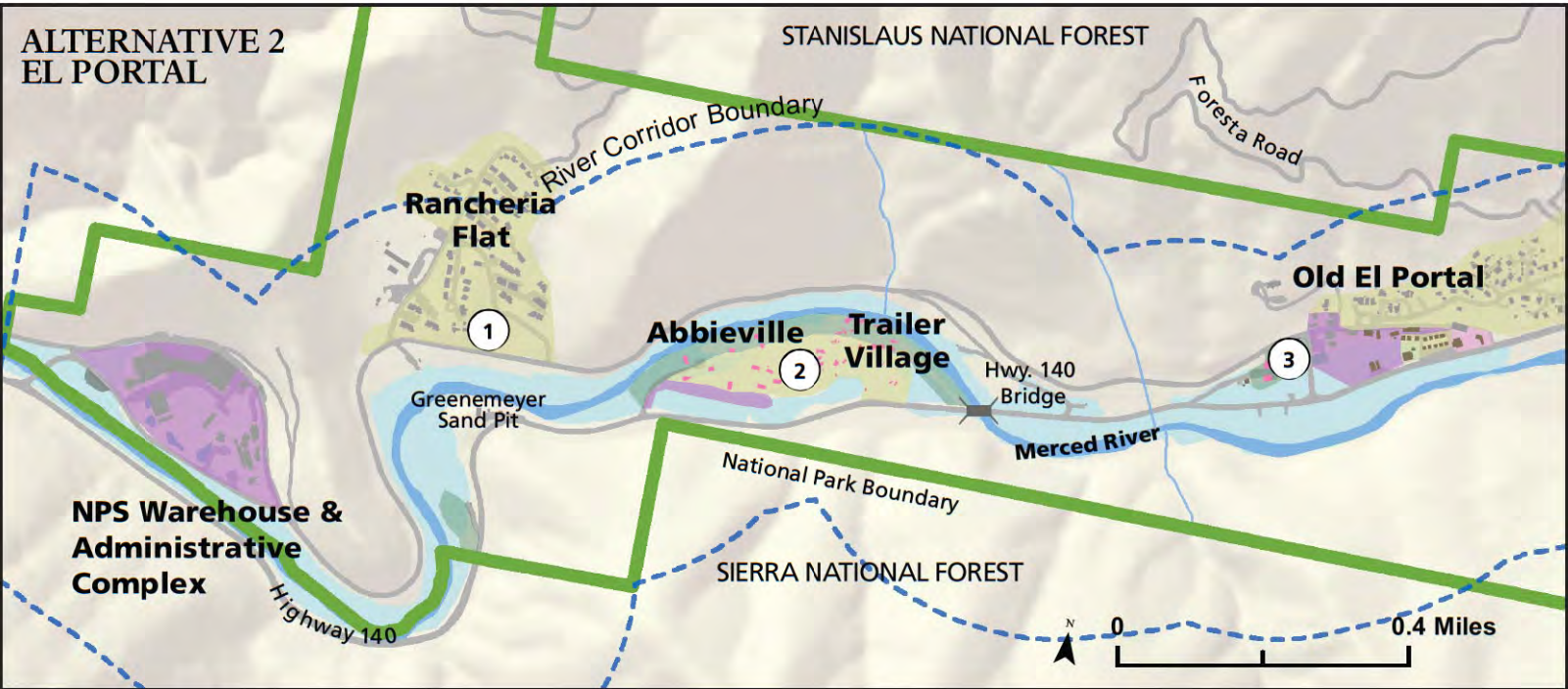
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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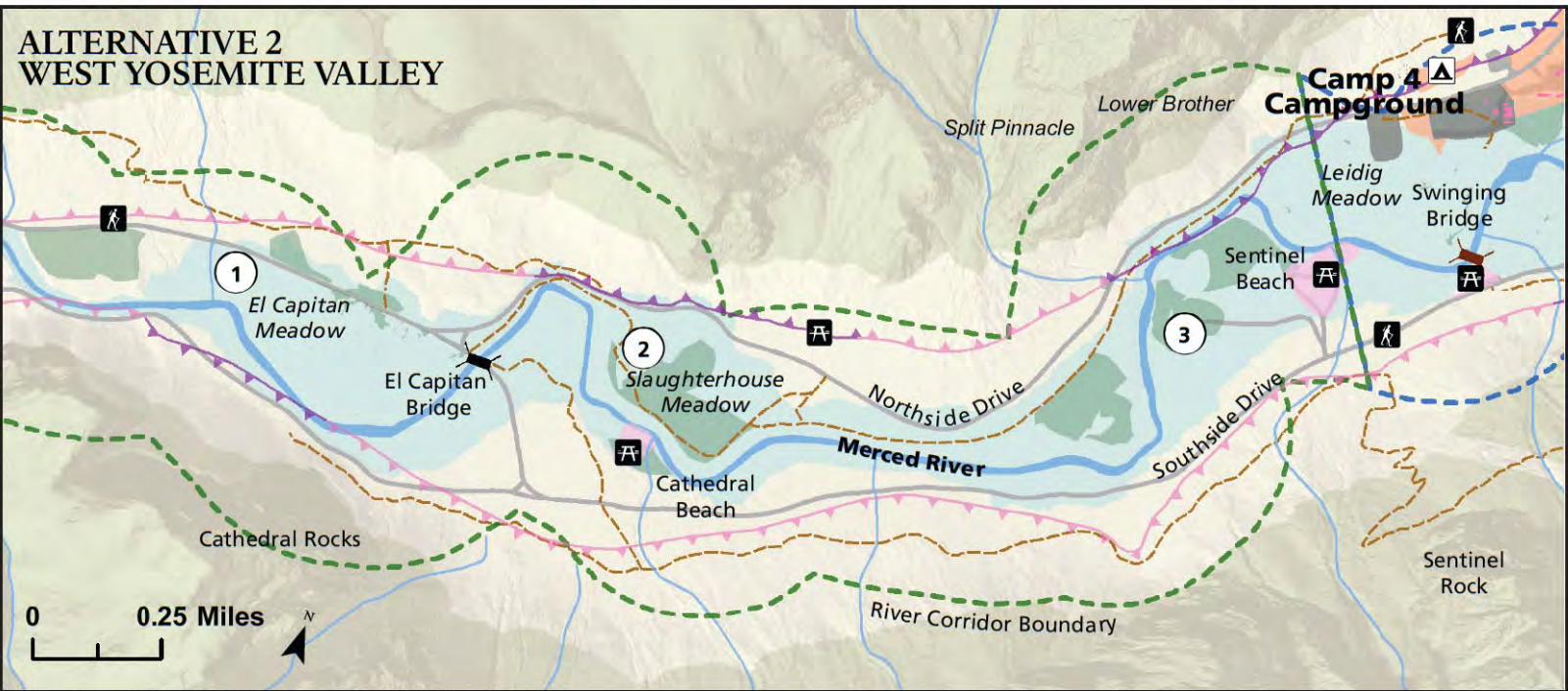


# ALTERNATIVE 2: SELF-RELIANT VISITOR EXPERIENCES AND EXTENSIVE FLOODPLAIN RESTORATION



## EL PORTAL

1. Rancheria Flat
  - Employee Housing: To replace temporary housing units to be removed Yosemite Valley, construct nine new units, away from sensitive resources.
2. Abbieville and Trailer Village
  - Abbieville and Trailer Village Housing: Remove or relocate 36 existing private residences in Abbieville and Trailer Village. This area would become both concessioner housing and administrative camping. To facilitate removal of temporary employee housing in Yosemite Valley, develop high-density housing units here for 405 employees.
  - Administrative Camping: Develop an administrative campsite at the Abbieville/Trailer Village area (camping relocated from Yellow Pine administrative site in Yosemite Valley).
3. El Portal Village Center
  - Valley Oak Restoration: Restore the rare floodplain community of valley oaks in Old El Portal through implementation of best management practices. Create a valley oak recruitment area of 2.25 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.
  - Odger's Fuel Storage Facility: Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompact soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.



## WEST YOSEMITE VALLEY

1. El Capitan Meadow Area
  - El Capitan Meadow Ecological Restoration: Remove all informal trails and areas of bare compacted soils and restore to native plant communities. Disperse and reduce roadside parking along the meadow through alternative pavement striping (approximately 30 spaces removed); retain some roadside parking for SAR and other administrative traffic. Use restoration fencing and signing where necessary to further protect the meadow from trampling. No boardwalks are constructed in Alternative 2.
2. Valley Loop Trail
  - Trail Re-Route: Re-route trail through Slaughterhouse Meadow out of wetland habitat to an upland area. Move a 780-foot section of the trail through Bridalveil Meadow to the base of the Southside Drive road shoulder.
3. Yellow Pine Campground
  - Ecological Restoration: Remove administrative camping at Yellow Pine and restore the 100-year floodplain to natural conditions. Relocate administrative camping to Abbieville and the Trailer Village area in El Portal.

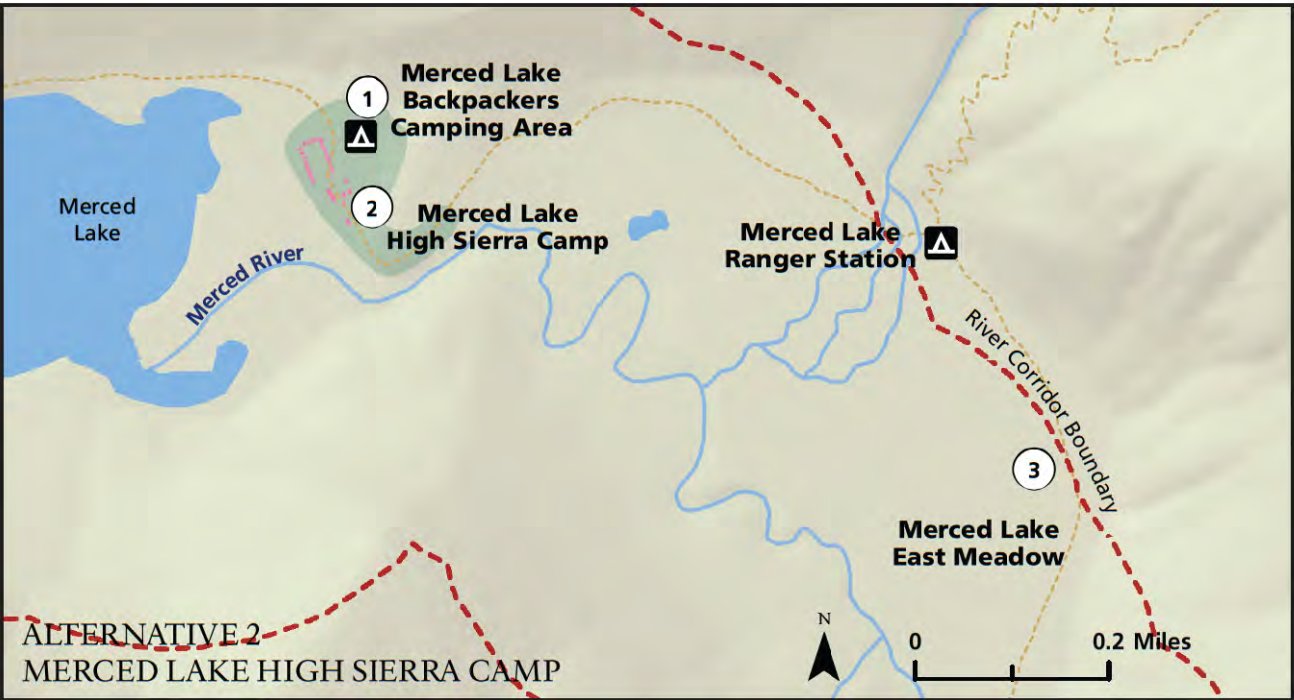
## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		



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# ALTERNATIVE 2: SELF-RELIANT VISITOR EXPERIENCES AND EXTENSIVE FLOODPLAIN RESTORATION



## MERCED LAKE HIGH SIERRA CAMP

1. Merced Lake Backpackers Camping Area: Discontinue designated camping in this area but allow dispersed camping here and in the Merced Lake High Sierra Camp. Remove waste-water system and flush toilets.
2. Merced Lake High Sierra Camp: Close and remove this lodging facility. Expand dispersed camping at the Merced Lake Backpackers Camping Area into the High Sierra Camp footprint. Remove all permanent infrastructure, including the buildings, water and septic system. Ecologically restore the area and convert the area to designated Wilderness.
3. Merced Lake East Meadow: Remove the meadow from grazing permanently. Require all administrative pack stock passing through the Merced Lake area to carry pellet feed.

## OTHER SEGMENT 1 CAMPING AREAS

- Little Yosemite Valley: Discontinue designated camping in this area, but allow dispersed camping. Remove all infrastructure associated with the designated camping area.
- Moraine Dome: Discontinue designated camping in this area, but allow dispersed camping.



## WAWONA

1. Wawona Campground: Retain 64 campsites and one group site. Remove 32 sites that are located within the 100-year floodplain or culturally sensitive areas.
2. Wawona Meadow Restoration: Remove nine-hole golf course and restore to meadow conditions. Retain spray field associated with waste water treatment facility.
3. Wawona Stables: Eliminate stable operation and commercial day rides. Relocate two stock-use campground sites from a sensitive resource area to the existing stables area.

## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		

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## Detailed Description of Alternative 2 by Segment

### *Segment 1: Wilderness above Nevada Fall (Wild Segment)*

#### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 2 would include the following action to protect and enhance river values:

##### *Biological Values*

- Prohibit administrative pack stock grazing at Merced Lake East Meadow. Require administrative stock to pack in pellet feed.

##### *Recreational Values*

- Wilderness character would be enhanced through the removal of the Merced Lake High Sierra Camp and converting this area to designated Wilderness.
- Reduce visitor use (thus crowding) at Little Yosemite Valley and Merced Lake by converting all designated camping areas to dispersed camping. With the conversion to dispersed camping visitors would have the opportunity to camp out of sight and sound from other campers. Additionally, trailhead quotas would be reduced for trailheads that lead to Little Yosemite Valley.

#### **User Capacity, Land Use and Facilities Management**

Alternative 2 would significantly reduce the amount of infrastructure and the amount of use in Segment 1 to promote dispersed camping and increase opportunities for solitude. In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-77), Alternative 2 would include the following actions to manage user capacity, land use, and facilities:

##### *Visitor Activities and Services*

Overnight use in this segment would consist of visitors staying overnight dispersed throughout the Wilderness.

Private boating would be allowed in this segment under this alternative. Generally, this kind of use would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Put-ins and take-outs would be allowed in dispersed areas. The level of use would be unrestricted as use levels for this activity would be expected to remain low due to the remote nature of this segment.

No overnight commercial groups would be allowed in Wilderness zones in Segment 1.

##### *Visitor Overnight Capacity*

Overnight capacities would be reduced through the trailhead quota system, as shown in Table 8-17, and services would be managed as follows:

- Remove the Merced Lake High Sierra Camp.
- Transition the designated backpackers camping areas Merced Lake, Little Yosemite Valley, and Moraine Dome to dispersed camping zones; remove infrastructure.

**TABLE 8-17: WILDERNESS ZONE CAPACITIES – ALTERNATIVE 2**

Wilderness Zones	Alt 2 Zonewide Capacity	Alt 2 Zone Capacity Specific to the River Corridor
Little Yosemite Valley Zone	25 people (-125 people*)	25 people (-125 people*)
Merced Lake Zone	50	50
Washburn Lake Zone	150	100
Mount Lyell Zone	50	10
Clark Range Zone	50	10

*Visitor Day Use Capacity*

Day use access to this segment is addressed under “Actions Common to Alternatives 2-6,” beginning on page 8-53.

*Administrative Activities*

- Reduce administrative activities as a result of the reduced zone capacities, removal of designated camping area, and removal of infrastructure. Backcountry utilities would no longer be needed in this segment following the removal of infrastructure at Little Yosemite Valley and Merced Lake High Sierra Camp.

*Segment 2: Yosemite Valley (Recreational and Scenic Segments)***Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 2 would include the following actions to protect and enhance river values:

*Free Flow*

- Remove Stoneman Bridge and restore the river banks to natural conditions.
- Remove Sugar Pine and Ahwahnee Bridges and associated berm/elevated trail connecting them; restore riverbanks to natural conditions; reroute multiuse trail north along the river.

*Water Quality*

- Remove the Curry Village stable and the pack trail from the stable to Happy Isles; restore to natural conditions.

*Biological Values*

Alternative 2 would restore major portions of the floodplain:

- Remove all existing campsites and infrastructure within the 100-year floodplain and restore natural floodplain and riparian habitat (25 acres).
  - **Backpackers Camp:** Remove all 25 sites, 21 of which are in the 100-year floodplain (and within 150 feet of the ordinary high-water mark). (Replace 16 sites to the west of the current campground.)



- **North Pines Campground:** Remove all 86 campsites and restore the 100-year floodplain to natural conditions.
- **Lower Pines Campground:** Remove 32 campsites from the 100-year floodplain; restore the floodplain to natural conditions.
- **Upper Pines Campground:** Remove 22 campsites from the 100-year floodplain; restore the floodplain to natural conditions. (Remove an additional 2 sites to protect cultural resources; retain 216 sites.)
- **Former Lower and Upper River Campgrounds:** Remove all abandoned facilities, including the Lower River amphitheater structure, and restore 35.6 acres of natural floodplain topography and riparian/ wetland habitat within the 10-year floodplain; temporarily fence restoration areas to allow for recovery.
- **Yosemite Lodge:** Remove most buildings at Yosemite Lodge, including the four that are within the 100-year floodplain; restore the 100-year floodplain to natural conditions.
- **Former Pine and Oak Units:** Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were removed after the 1997 flood) and wellness center while maintaining access to the well house.
- **Ahwahnee Row and Tecoya Dorms:** Remove concessioner housing and development between the Village Store and Ahwahnee Meadow; recontour topography (using 1919 maps as a guide), decompact soils, and plant native meadow vegetation. Restore stream hydrologic function.
- **Yosemite Village:** Move the Yosemite Village Day-use Parking Area northward, out of the 10-year floodplain of the Merced River and outside of a designated 50-foot setback from Indian Creek; remove fill material and restore the floodplain to natural conditions.
- **Housekeeping Camp:** Remove all 266 lodging units and associated facilities at Housekeeping Camp (restrooms, shower houses, laundry, grocery store, and office), out of the 100-year floodplain; restore the floodplain to natural conditions by decompacting soils and planting riparian species. Direct visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge; fence off the current eastern river access point located on a steep eroded bank, and actively restore the riverbank with brush layering.

Alternative 2 would enhance meadow connectivity by removing segments of roads and trails that currently bisect meadows, interrupting sheetflow and causing habitat fragmentation.

- **Bridalveil Meadow:** Reroute the 780-foot segment of the Valley Loop Trail that currently crosses Bridalveil Meadow closer to the base of the fill slope of the Valley Loop Road.
- **Slaughterhouse Meadow:** Reroute the portion of the Valley Loop Trail to an upland area out of wetlands at Slaughterhouse Meadow.
- **El Capital Meadow:** Disperse and reduce roadside parking along El Capitan Meadow (approximately 30 spaces removed) to reduce the amount of social trailing into the meadow. Fence if necessary to further protect the meadow from trampling.
- **Ahwahnee Meadow:** Remove 900 feet of Northside Drive and relocate the bike path to the south, restoring Ahwahnee Meadow and riparian floodplain connectivity; restore meadow contours and native vegetation. Reroute trails through Ahwahnee Meadow so they do not pass through wetlands, consolidating use with the Housekeeping footbridge trail where possible; remove associated fill and restore trails within wetlands.
- **Stoneman Meadow:** Remove the segment of Southside Drive that bisects Stoneman Meadow (1,335 feet); realign Southside Drive through Boys Town. Extend the boardwalk through wet areas to Curry Village (up to 275').

### *Scenic Values*

- Eliminate visual intrusion of Southside Drive through Stoneman Meadow
- Eliminate visual intrusion of Northside Drive through Ahwahnee Meadow.

### *Cultural Values*

- Remove four structures from the collective sites representing the prominent historic patterns of development in Yosemite Valley: Sugar Pine Bridge, Ahwahnee Bridge, Stoneman Bridge, and Residence 1 (Superintendent's House).
- Relocate Residence 1 to the NPS housing area and at a minimum stabilize the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995).

### *Recreational Values*

- Restrict boating to 25 people per day using private vessels only and to specific stretches of river in Yosemite Valley. This reduction in boats would enhance dispersed recreation along the river corridor.
- Reduce available day-use parking and implement an East Yosemite Valley day-use parking permit system to reduce crowding at key attraction sites, along roadways, and in parking lots and other facilities).

## **User Capacity, Land Use and Facilities Management**

### *Visitor Activities and Services*

Alternative 2 would protect river-related recreational ORVs through infrastructure improvements where necessary, while reducing recreational activities that are not related to recreational ORVs. It would include the following changes to visitor activities and services in addition to those common to Alternatives 2-6 (see page 8-77):

- Allow only private boating in this river segment. Private boats would be limited to the section of river between the Pines campgrounds and Sentinel Beach. Put-ins and take-outs would be limited to designated locations within the Pines campgrounds and day-use public sites. This use would be monitored by a river patrol and would be limited to 25 permits per day.
- Remove Housekeeping Camp shower houses, restrooms, laundry, and grocery store. (Retain at least one restroom when reconfiguring the area for day use.)
- Remove the Concessioner Stable and restore the area to natural conditions.
- Remove Curry Village raft rental.

### *Visitor Overnight Capacity: Camping*

Camping would be reduced slightly to 450 sites accommodating 2,916 people per night. Many campsites removed from sensitive riparian areas would be replaced by a new 100-site campground in the area currently occupied by Yosemite Lodge. The following actions would occur at specific locations:

- **Backpackers Camp:** Remove all 25 sites, 21 of which are in the 100-year floodplain. Construct 16 new walk-in campsites west of Backpackers Camp.
- **North Pines Campground:** Remove all 86 campsites; restore the floodplain to natural conditions.

- **Upper Pines Campground:** Retain 216 campsites. Remove 22 campsites from the 100-year floodplain; restore natural floodplain conditions.
- **Lower Pines Campground:** Retain 44 campsites. Remove 32 sites that are within the 100-year floodplain.
- **Camp 4:** Retain 35 walk-in campsites and 35 parking spaces. Construct 35 additional campsites east of Camp 4; establish a new parking area (41 spaces) for the Camp 4 campground expansion in the disturbed footprint of the former service station near Camp 4.
- **New Construction:** Construct a new campground with 100 walk-in campsites and 4 group sites in the area formerly occupied by Yosemite Lodge.

### ***Visitor Overnight Capacity: Lodging***

Under Alternative 2 lodging would be significantly reduced to facilitate ecological restoration, day use, and camping. Lodging would total 556 units accommodating 1,842 people per night. Common to Alternatives 2-6, The Ahwahnee would continue to provide 123 lodging rooms. The following additional lodging would be retained, removed, or constructed under Alternative 2:

Conceptual site drawings for lodging improvements at Boys Town under Alternative 2 have been completed to allow the analysis of impacts of this potential project. See "Conceptual Site Drawings" at the end of the Alternative 2 discussion for site details and design drawings.

- **Curry Village:** Retain 355 lodging units: 290 tents, 18 units at Stoneman House, and 47 hard-sided cabins with bath. Remove all existing cabins and associated structures at Boys Town. Construct 78 new lodging units suitable for year-round accommodations at Boys Town (25 duplex buildings and seven 4-plex buildings, all with private baths); construct a new guest check-in building and pedestrian pathway; provide 78 new parking spaces along the existing roadway. Provide 420 designated overnight parking spaces at Curry Orchard.
- **Housekeeping Camp:** Remove all 266 lodging units and associated facilities from the 100-year floodplain. (Convert the site to a day use river access point and picnic area, retaining one restroom for day use.)
- **Yosemite Lodge:** Remove all 245 lodging units; retain the core portion of the lodge containing the cafeteria. (Convert area for visitor day use and camping).

### ***Visitor Day-use Parking Capacity and Transit***

Alternative 2 would significantly reduce the maximum daily visitation to Yosemite Valley. The day parking, regional transit, and tour bus capacities would accommodate up to 6,819 day users at one time in segment 2:

- Reduce available day-use parking spaces (- 537 spaces) for a total of 1,800 parking spaces accommodating a maximum of 4,698 people at one time.
- Accommodate an estimated 1,160 people at one time in circulation on Valley roads.
- Accommodate a maximum of 241 people at one time arriving to the Valley on regional transit.
- Retain tour bus parking at 15 spaces accommodating up to 720 people at one time.

Visitor circulation would be improved to reduce traffic congestion and to provide a better arrival experience for visitors. Major actions would include the following:

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- Redesign day parking at Yosemite Village to provide 550 designated spaces.
- Construct a new parking lot and a comfort station, providing 150 parking spaces for day visitors and 15 spaces for tour buses, west of Yosemite Lodge.
- Redesign the intersection at Sentinel Bridge, and switch Southside Drive to a two-way road.

Conceptual site drawings for the Yosemite Village Day-use Parking Area and the new parking lot west of Yosemite Lodge under alternative 2 have been completed to allow the analysis of impacts of these potential projects. See "Conceptual Site Drawings" at the end of the Alternative 2 discussion for site details and design drawings.

Due to the reductions day use parking supply in this alternative, as compared to current peak demand, an East Yosemite Valley day-use parking permit system would be instituted.

Regional transit service would be reconfigured to expand the number of routes, but to reduce runs on some routes, consistent with anticipated demand, as shown in Table 8-18. Shuttle service would also be improved as shown in the table.

**TABLE 8-18: TRANSIT OPTIONS- ALTERNATIVE 2**

Regional Transit Options	
HWY 140 Merced/Mariposa to Yosemite Valley	8 runs per day (4 from Merced; 4 from Mariposa) (year round)
HWY 41 Fresno/Oakhurst to Yosemite Valley	1 run per day
HWY 120 West Groveland/Sonora to Yosemite Valley	1 weekday run- Sonora to Valley 2 weekend runs- Groveland to Valley (summer only)
HWY 120 East Inyo/Mono County (Mammoth Lakes) to Yosemite Valley	1 run per day (summer only)
Yosemite Valley Shuttle Options	
East Yosemite Valley	5 minute peak interval between buses Year round except Visitor Center direct
Visitor Center Express Yosemite Valley Day-use Parking Area to Visitor Center	15 min. interval between buses (summer only)
El Capitan Crossover	30 min. interval between buses (summer only)
West Yosemite Valley	No service

### *Administrative Activities*

Administrative activities would be reduced commensurate with the reduction in services:

- Remove the Yosemite Lodge maintenance and housekeeping facilities.

### ***Employee Housing and Employee Parking***

Concessioner employee housing would be reduced commensurate with the reduction in services. Compared to existing conditions, 657 fewer concessioner employees would be housed in Yosemite Valley. The remaining housing for 494 concessioner employees would be provided as follows:

- Provide housing for 387 employees at Curry Village.
  - Retain permanent housing in the Curry Village residential area (223 employees)
  - Remove housing at Curry Village stable (49 employees)
  - Construct 16 buildings housing 164 employees.
- Provide housing for 65 employees at Yosemite Village:
  - Retain permanent housing at Indian Creek, Lost Arrow Dorm, and Upper Tecoya Management Housing (64 employees)
  - Remove Ahwahnee Row, Y Apartments, garage housing, and Hospital Row (43 employees)
  - Remove Tecoya Dorms (232 employees)
- Remove administrative campsites at Yellow Pine Administrative Campground (4 group sites for up to 120 people); relocate administrative camping to Abbieville and Trailer Court.

An additional 426 concessioner employees working in Yosemite Valley would be housed in El Portal.

### ***Segment 3: Merced Gorge (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 3 for Alternative 2 are included in the “Actions Common to Alternatives 2-6” (page 8-53).

#### **User Capacity, Land Use and Facilities Management**

This alternative would provide for similar kinds and amounts of use that exist today. The majority of actions for Alternative 2 in Segment 3 are discussed in the “Actions Common to Alternatives 2-6” (page 8-77).

Alternative actions that are not included in the Actions Common section are listed below.

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-77), Alternative 2 would include the following actions to manage user capacity, land use, and facilities:

#### ***Visitor Activities and Services***

Only private boats would be allowed in this segment in Alternative 2. It is expected that kayaks would be the craft used in this segment. Boaters would be allowed on the river below Pohono Bridge (in Segment 2) through El Portal (Segment 4). Boaters would be allowed to put in and take out at any of the roadside pull outs. This use would be managed by a permit system and restricted to 5 boats per day.

#### ***Transit Options***

Public transit options along this segment would be expanded as described in the Valley segment (see Segment 2 - Transit Options above).

### ***Segment 4: El Portal (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 4 under Alternative 2 are addressed in “Actions Common to Alternatives 2-6” (see page 8-53).

#### **User Capacity, Land Use and Facilities Management**

Alternative 2 would provide for similar kinds and amounts of use that exist today. User capacity in this segment for this alternative is mostly affected by the increase in employee housing in El Portal. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in Yosemite Valley (Segment 2).

#### ***Visitor Activities and Services***

Most visitor activities and services in Segment 4 are considered in “Actions Common to Alternatives 2-6” (page 8-77). Additional actions are listed below:

- Allow only private boats in Segment 4. Expected use would be mostly rafts and kayaks. Boaters would be permitted below Yosemite View Lodge to beyond the Foresta Bridge (at which point boaters would exit the park). Boaters would be able to use put-ins and take-outs below the hotel, at the store/gas station and the Red Bud launch site. This use would be regulated through a permitting system that allows for 5 boats per day.

#### ***Visitor Overnight Capacity***

No visitor overnight accommodations on NPS lands are proposed in this alternative.

#### ***Visitor Day-use Parking Capacity***

Day-use and parking capacities would remain the same as current conditions, at a total of 214 spaces accommodating up to 740 people at one time.

#### ***Administrative Activities***

All administrative activities in Segment 4 are considered in “Actions Common to Alternatives 2-6” (see page 8-83).

#### ***Employee Housing Capacity***

In Alternative 2, high density employee housing would be added to the Abbieville and Trailer Village site (405 beds) and infill units at El Portal Village Center (12 beds) and Rancheria Flat (9 beds). All new units would be outside of the 100-year flood plain. These units would be added to accommodate for the housing removed from Yosemite Valley (Segment 2) and would include the 426 concessioner employee beds relocated to El Portal from the Valley.

Administrative use at the Yellow Pine Administrative Campground site would be moved to Abbieville and Trailer Court.

### ***Employee and Administrative Capacity***

Most employee and administrative parking actions are discussed in “Actions Common to Alternatives 2-6” (page 8-83). Additionally, 9 spaces would be added with the Rancheria housing expansion, 12 spaces would be added with the El Portal housing expansion and 405 spaces would be added for residents of the new Abbieville site.

### ***Transit Options***

Regional transit options would maintain existing service along the Highway 140 corridor.

## ***Segment 5: South Fork Merced River above Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions in Alternative 2 that are specific to this segment.

### **User Capacity, Land Use and Facilities Management**

Alternative 2 would provide for similar kinds and amounts of use that exist today in Segment 5. The majority of actions for Alternative 2 in Segment 5 are discussed in the “Actions Common to Alternatives 2-6” (beginning on page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Use levels would be unrestricted as little use is expected in this area due to its remote location.

### ***Transit Options***

Specific transportation options for reaching the trailheads that provide access to Segment 5 are listed below under Segment 7.

## ***Segments 6/7: Wawona and Wawona Impoundment (Recreational Segments)***

### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (see page 8-53), protection and enhancement of cultural values and water quality would be accomplished through the actions described below.

### ***Cultural Resources/Water Quality***

- Stock Campground: Relocate stock campground (2 sites) from a culturally sensitive area to the Wawona Stables area.
- Wawona Campground: Remove 32 sites that are either within the 100-year floodplain or in culturally sensitive areas.



## **User Capacity, Land Use and Facilities Management**

Alternative 2 would provide for reduced kinds and amounts of use in this segment compared to those that exist today. These reductions would be made to accommodate high levels of ecological restoration activity. The majority of actions for Alternative 2 in Segment 7 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Most visitor activities and services in Segment 7 are considered in “Actions Common to Alternatives 2-6” (see page 8-77). Additional actions are listed below:

- **Boating:** Only private boating would be allowed. Expected use would be mostly kayaks and other small whitewater boats. Boaters would be permitted below Swinging Bridge to beyond the park boundary, with the exception of the Wawona impoundment. Boaters would be able to use put-ins and take-outs at Swinging Bridge, the store area, South Fork Picnic Area and below the campground. This use would be regulated through river patrol and monitoring as the use level is expected to be low, and therefore would not be limited.
- **Golfing:** In this alternative the Wawona golf course and shop would be removed to accommodate ecological restoration, though the spray field would remain.
- **Tennis:** The Wawona Hotel Tennis Court would also be removed under this alternative.
- **Wawona Commercial Stables:** Stables and day rides would be eliminated under Alternative 2. The Wawona stock use campground (2 sites) would be relocated to this area.

### ***Visitor Overnight Capacity***

The total overnight capacity for Segment 7 would be 171 units accommodating 426 people.

The Wawona Campground would reduce campsites to 65 sites (414 people). This includes a group camping site (to accommodate up to 30 persons). The two campsites at the Wawona stock camp would be relocated to the Wawona stables (accommodating 6 people per night each).

### ***Visitor Day Use Capacity***

Total visitor day use capacity for this area would be increased from 1,295 to 1,321 people at one time. This increase is due to new regional transit options that contribute up to 26 visitors at one time to this segment.

### ***Transit Options***

Regional transportation options between Wawona and Yosemite Valley and Wawona and Mariposa Grove would continue existing service. One run between Fresno and Yosemite Valley along Highway 41 would be added.

## ***Segment 8: South Fork Merced River below Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions in Alternative 2 that are specific to this segment.

## **User Capacity, Land Use and Facilities Management**

Alternative 2 would provide for similar kinds and amounts of use that exist today in Segment 8 and significant changes are not proposed. The majority of actions for Alternative 2 in Segment 8 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Permits would not be required as the expected use level is very low.

### ***Transit Options***

Transit services for access to this segment are described above under Segment 7.

## **Analysis of Facilities and Services**

Table 8-19 presents the park’s assessment of the particular facilities and services that would be needed to support public use and/or to protect river resources based on the types, levels, and locations of use proposed for Alternative 2. As an example, the goals of this alternative include a more self-reliant visitor experiences and extensive floodplain restoration. This alternative prescribes major restoration within the 100-year floodplain and the lowest visitor use levels of all of the alternatives, therefore making it possible to by remove North Pines Campground and Housekeeping Camp, and shift the Yosemite Village Day-use Parking Area north out of the 100-year floodplain. In addition, the Yosemite Lodge overnight accommodations would be replaced with a campground and the Merced Lake High Sierra Camp would be eliminated.

**TABLE 8-19: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 2**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 1: Wild</b>			
Merced Lake High Sierra Camp	Closed and removed	<b>No:</b> Removal of this facility is consistent with land-use restoration goals because, under this alternative, use levels are substantially lower; therefore, the level of overnight accommodations and camping is substantially lower, and this facility can be removed. The number of camp beds allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No:</b> The High Sierra Camp is outside designated Wilderness; however it is surrounded by designated wilderness. Designated wilderness precludes the construction of new facilities such as this. Alternatives in Chapter 8 consider various means of addressing impacts to ORVs.
Merced Lake Backpackers Camping Area	Converted to dispersed camping	<b>No:</b> Removal of this designated camping is consistent with land-use restoration goals because, under this alternative, use levels are substantially lower; therefore, the level of overnight accommodations and camping is substantially lower, and this facility can be removed.	<b>N/A:</b> This facility will be eliminated.
Little Yosemite Valley Camping Area	Converted to dispersed camping	<b>No:</b> Removal of this designated camping is consistent with land-use restoration goals because, under this alternative, use levels are substantially lower; therefore, the level of overnight accommodations and camping is substantially lower, and this facility can be removed.	<b>N/A:</b> This facility will be eliminated.
Moraine Dome Camping Area	Converted to dispersed camping	<b>No:</b> Removal of this designated camping is consistent with land-use restoration goals because, under this alternative, use levels are substantially lower; therefore, the level of overnight accommodations and camping is substantially lower, and this facility can be removed.	<b>N/A:</b> This facility will be eliminated.
<b>Segment 2: Curry Village and Campgrounds</b>			
Upper Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Lower Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
North Pines Campground	Removed	<b>No:</b> Removal of this facility is consistent with land-use restoration goals because, under this alternative, use levels are substantially lower; therefore, the level of overnight accommodations and camping is substantially lower, and this facility can be removed.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.

**TABLE 8-19: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 2**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Backpackers Campground	Removed (partially re-located)	<b>No:</b> Removal of this facility is consistent with land-use restoration goals because, under this alternative, use levels are substantially lower; therefore, the level of overnight accommodations and camping is substantially lower, and this facility can be removed.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Valley Campground Reservation Center	Relocated (due to Southside Drive re-routing)	<b>Yes:</b> The Valley Campground Reservation Center is an essential National Park Service point-of-contact for campers, and those who seek campsites, in Yosemite Valley. The Campground Reservation Center staff sells campsite reservations for all campsites in the park available for reservations. The Reservation Center is operated on a year-round basis.	<b>Yes.</b> The Campground Reservation could be moved from its existing location. However, it is important to the successful delivery of services provided from the reservation center that any alternative location is near the Valley campgrounds.
Housekeeping Camp Lodging Units	Removed	<b>No:</b> Under this alternative the level of visitor accommodations is reduced and therefore elimination of these rustic overnight guest accommodations are not needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs	<b>No.</b> No alternative areas of sufficient size to accommodate this lodging facility (adjacent to the river, which is an integral part of the overnight experience )are available for development in Yosemite Valley
Housekeeping Camp Laundry	Removed	<b>No:</b> The public laundromat at Housekeeping Camp is not needed with the elimination of the Housekeeping Camp.	<b>No.</b> This service is provided for Housekeeping Camp guests and is directly linked to the camp; relocating the service and providing a general laundry facility for park visitors is not necessary.
Housekeeping Camp Shower Houses and Restrooms	Retained 1 restroom. Removed shower houses, laundry, and grocery.	<b>Yes:</b> Public restrooms are needed in many areas throughout the river corridor to comply with public health regulations and meet the basic personal needs of visitors and employees. The public showers at Housekeeping Camp are provided for guest use as well as other patrons, including campers and hikers.	<b>No.</b> The Housekeeping Camp restrooms and shower houses are components of the overnight guest accommodations at this location. They are required to be located within or very near the overnight sleeping units.
Housekeeping Camp Grocery	Removed	<b>No:</b> This need for the grocery store is tied to the level of lodging units at Housekeeping Camp. With a reduction of lodging, the grocery store is not needed.	<b>Yes.</b> The merchandise offered at this location is offered elsewhere in Yosemite Valley.
Curry Village Lodging and Shower Houses	Expanded	<b>Yes:</b> Curry Village offers rustic and economy overnight guest accommodations consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs. This facility is needed to support public use by visitors who do not camp.	<b>No.</b> This lodging facility is part of a National Register Historic District. It is not feasible to relocate the complex, including shower and toilet facilities needed by guests in without-bath accommodations, to locations outside the river corridor.
Curry Village Overnight Parking	Reduced	<b>Yes:</b> Parking at Curry Village is needed to support the day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.

**TABLE 8-19: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 2**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Curry Orchard Parking Area	Re-developed	<b>Yes:</b> Parking at Curry Village Orchard is needed to support day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Village Raft Rental	Removed	<b>No:</b> This is not a vital visitor service under this alternative.	<b>No.</b> By its very nature, the raft rental facility should be located within the river corridor.
in Yosemite Valley	Removed and ecologically restored	<b>No:</b> Under this alternative removal of this facility is consistent with the land use restoration goals and is not needed to support the High Sierra Camp operations.	<b>N/A:</b> This service will be eliminated.
Concessioner Stables Employee Housing Area	Removed and restored ecologically	<b>No:</b> Under this alternative removal of this facility is consistent with the land use restoration goals and is not needed to support employee housing needs due to a reduced level of visitor services.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Northside Drive (Stoneman Bridge to Camp 6)	Roadway section removed	<b>No:</b> Under this alternative this segment of Northside Drive through Ahwahnee Meadow is removed and therefore this bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would access the east Yosemite Valley by way of Southside Drive, which would be converted to two-way traffic. This change in traffic circulation for Yosemite Valley would be feasible due to substantial reduction in visitor use levels.	<b>N/A</b> This section of roadway is removed and traffic is re-routed to Yosemite Valley destinations using nearby roadway sections.
Southside Drive (through Stoneman Meadow)	Roadway section removed	<b>No:</b> Under this alternative this segment of Southside Drive through Stoneman Meadow is and traffic is routed through Curry Village giving pedestrians, bicycles, NPS law enforcement and fire protection access the east Yosemite Valley. This change in traffic circulation for Yosemite Valley would be feasible due to substantial reduction in visitor use levels.	<b>N/A</b> This section of roadway is removed and traffic is re-routed to Yosemite Valley destinations using nearby roadway sections.
Sugar Pine Bridge	Removed	<b>No.</b> Under this alternative this pedestrian, bicycle, and emergency vehicle bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would be re-routed north of river so that visitors can access points of interest in Yosemite Valley. Removal of this bridge will restore free-flowing conditions and riparian habitat.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Ahwahnee Bridge	Removed	<b>No.</b> Under this alternative this pedestrian, bicycle, and emergency vehicle bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would be re-routed north of river so that visitors can access points of interest in Yosemite Valley. Removal of this bridge will restore free-flowing conditions and riparian habitat.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.

TABLE 8-19: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 2

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Stoneman Bridge	Removed	<b>No.</b> Under this alternative this pedestrian, bicycle, and emergency vehicle bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would be re-routed north of river so that visitors can access points of interest in Yosemite Valley. Removal of this bridge will restore free-flowing conditions and riparian habitat.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
<b>Segment 2: Yosemite Village and Housekeeping Camp</b>			
Ahwahnee Row Employee Housing	Removed	<b>No:</b> Under this alternative removal of this facility is consistent with land use restoration goals and these housing facilities are not needed given the substantial reduction of commercial services and lodging.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lower Tecoya Employee Housing Area	Removed	<b>No:</b> Under this alternative removal of this facility is consistent with land-use restoration goals and these housing facilities are not needed given the substantial reduction of commercial services and lodging.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lost Arrow Employee Housing Area	Removed and re-developed (as administrative parking)	<b>No:</b> Under this alternative removal of this facility is consistent with land-use restoration goals and these housing facilities are not needed given the substantial reduction of commercial services and lodging.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Re-route Northside Drive south of Yosemite Village Day-use Parking Area and outside of the 10-year floodplain	Rerouted roadway	Yes: This roadway serves as the exit road for all Yosemite Valley traffic. The congestion created in this vicinity is a result of pedestrian-vehicle conflicts that would be completely mitigated if no pedestrians were required to cross the road from the parking lot to access numerous visitor services including the primary visitor center, museum, and the Valley shuttle.	No. While some changes to the exact location of the road system could be feasibly rerouted for approximately ¼ mile, it could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor traffic in Yosemite Valley is identified.
Yosemite Village Day-use Parking Area	Re-developed and expanded	<b>Yes:</b> This facility will serve as the primary day-use parking lot for Yosemite Valley because it is proximate to numerous visitor services including the primary visitor center, museum, and the Valley shuttle. A day-use visitor parking area of this size is needed to support the level of public use that has been found to protect and enhance river values.	<b>No.</b> While some changes to the exact location of the parking lot and road system leading to the parking lot could be feasibly relocated, the parking lot could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor parking in Yosemite Valley is identified.

**TABLE 8-19: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 2**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp (cont.)</b>			
Residence 1 (Superintendent's House)	Relocated	<b>Yes.</b> This historic structure is a component of the Historic Resources ORV and would be rehabilitated and used to support the visitor experience.	<b>Yes.</b> Under this alternative, the facility would no longer be a component of the Historic Resources ORV and could be relocated outside the river corridor to the lower NPS housing area.
<b>Segment 2: Yosemite Lodge and Camp 4 Area</b>			
Yosemite Lodge Overnight Units	Removed	<b>No:</b> Under this alternative removal of this facility is consistent with land-use restoration and visitor-service goals.	<b>No.</b> While some buildings within the Yosemite Lodge complex could be relocated to sites further north of the Merced River, however, it is not feasible to consider a wholesale relocation of the complex to an alternative location.
Yosemite Lodge Overnight Parking	Re-purposed as a day-lodge area	<b>Yes:</b> Parking is needed to support day visitors to the Yosemite Lodge. Parking is also needed for park partner organizations and NPS staff who use the Lodge's meeting and interpretive spaces (i.e., the Cliff Room, Gardner Terrace, and the outdoor amphitheater).	<b>No.</b> As long as visitor services are provided at Yosemite Lodge, it will be necessary to provide parking near the Lodge complex.
Yosemite Lodge Garden Terrace and Cliff Room	Re-purposed for NPS use to provide visitor services	<b>No:</b> Under this alternative repurposing this facility space for day-lodge area services would likely still be used for interpretive programs and for training courses, meetings, and special events. These facilities are vital to National Park Service and park partner operations.	<b>No.</b> The Garden Terrace and Cliff Rooms are within the existing buildings at the Yosemite Lodge complex. The activities taking place at these locations could be considered for relocation to alternative facilities; however, it is not feasible to consider removing the buildings in their entirety.
Yosemite Lodge Gift and Grocery	Re-purposed for NPS use to provide visitor services	<b>No:</b> Under this alternative this space would be repurposed for NPS visitor related services and would likely require a consolidation of this type of merchandise (packaged and fresh groceries, sundries, and outdoor products) frequently needed by campers and hikers into the portion of the facility that would have commercial services.	<b>No.</b> The building currently housing the Yosemite Lodge Gift and Grocery Store is part of the Yosemite Lodge food service and retail structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Mountain Room Bar & Food Service	Re-purposed for NPS use to provide visitor services	<b>No:</b> Under this alternative this space would be repurposed for NPS visitor related services and food service would be provided in the portion of the facility that would have commercial services.	<b>No.</b> The building currently housing the Mountain Room Bar is part of the Yosemite Lodge food service structure and would be infeasible to relocate.



TABLE 8-19: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 2

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Lodge and Camp 4 Area (cont.)</b>			
Yosemite Lodge Mountain Room Restaurant	Re-purposed as a day-lodge area	<b>Yes:</b> Food services are necessary to support day-lodge visitors and those staying nearby in the expanded campground.	<b>No.</b> The building currently housing the Mountain Room restaurant is part of the Yosemite Lodge food service structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Highland Court Employee Housing (Existing)	Removed	<b>No:</b> Under this alternative removal of this facility is consistent with land-use restoration goals and these housing facilities are not needed given the substantial reduction of commercial services and lodging.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Yosemite Lodge Employee Housing (Thousands Cabins) (Existing)	Removed	<b>No:</b> Under this alternative removal of this facility is consistent with land-use restoration goals, and these housing facilities are not needed given the substantial reduction of commercial services and lodging.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
West of Lodge Campground (New)	Constructed	<b>Yes:</b> Campgrounds provide overnight accommodations that allow visitors to have a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size or location adjacent to the Camp 4 Campground (which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Yosemite Lodge Parking Area (New)	Constructed	<b>Yes:</b> This facility will serve as a critical day-use parking lot for Yosemite Valley because substantial numbers of roadside parking spaces adjacent to meadows will be removed in the vicinity of the Yosemite Village Day-use Parking Area. This new parking area will serve as trailhead parking for the upper and lower Yosemite Falls trail, and overflow evening parking for Camp 4 Campground. It will also be used for the Wauhoga Cultural Center.	<b>No.</b> No alternative areas of sufficient size or location proximate to upper and lower Yosemite Falls trailhead, Wauhoga, Camp 4 and the Yosemite Lodge could accommodate this parking area.
<b>Segment 2: West Yosemite Valley</b>			
Yellow Pine Administrative	Removed	<b>No:</b> Under this alternative removal of this facility is consistent with land-use restoration goals, and these administrative facilities are not needed given the substantial reduction of visitor use.	<b>No.</b> No alternative areas of sufficient size or location could accommodate this campground.

**TABLE 8-19: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 2**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 4: El Portal</b>			
Rancheria Employee Housing Area (New)	Constructed	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs, and to accommodate employees who provide resource protection services consistent with the mission of the National Park Service and current agency management policies.	<b>No.</b> In-fill employee housing should occur within existing employee housing areas
Abbeville / Trailer Village Employee Housing (New)	Constructed	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services.	<b>No.</b> There are no other suitable locations proximate with direct access to Highway 140 before entering Yosemite National Park boundary.
Abbeville / Trailer Village Administrative Group Campground (New)	Constructed	<b>Yes:</b> Campgrounds provide overnight accommodations that allow visitors to have a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in El Portal.
<b>Segment 5 (Wild), Segments 6 &amp; 7 (Recreational), Segment 8 (Wild)</b>			
Wawona Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> This campground could not be relocated as no suitable alternative site exists in the Wawona proper adjacent to the river, which is an integral part of the camping experience.
Wawona Hotel Tennis Court	Removed	<b>No:</b> Opportunities for this type of visitor recreation is not considered a vital visitor service given the land use and visitor experience goals under this alternative.	<b>N/A:</b> This service will be eliminated.
Wawona Hotel Golf Course & Shop	Removed	<b>No:</b> Opportunities for this type of visitor recreation is not considered a vital visitor service given the land use and visitor experience goals under this alternative.	<b>N/A:</b> This service will be eliminated.
Wawona Stables	Retained	<b>Yes:</b> The Wawona Stables would be utilized as operational space to serve administrative backcountry operations. This facility is necessary to support horseback riding, which is a type of use that has been found to be consistent with the protection and enhancement of river values.	<b>No.</b> The stable operates from a historic structure that could not be feasibly relocated.
Wawona Commercial Horseback Day Rides	Eliminated	<b>No:</b> Opportunities for this type of visitor recreation is not considered a vital visitor service given the land use and visitor experience goals under this alternative.	<b>N/A:</b> This service will be eliminated.

## **Conceptual Site Drawings**

### ***Boys Town***

In Alternative 2, all of these structures would be removed and replaced with 78 new lodging units suitable for year-round accommodation. This would consist of 25 duplex buildings and seven 4-plex buildings, all with private baths, and a new guest check-in building. A new 2,840-foot long pedestrian pathway and 78 new parking spaces would also be constructed along the existing roadway. The Curry Orchard Day-use Parking Area would be formalized using best management practices to have a total of 420 parking spaces. New ground disturbance within the existing 8.4 acre footprint would include approximately 33,000 square feet for new buildings, 56,800 square feet of utility service trenching, 14,200 square feet for pedestrian pathways, and 23,400 square feet of new parking for a total of 2.9 acres. Construction staging would cover approximately 1.4 acres and would likely take place within the existing Orchard Parking Area.

### ***Yosemite Village Day-use Parking Area***

In Alternative 2, the existing 6-acre Yosemite Village Day-use Parking Area and all associated roadway improvements would be moved outside of the 10-year floodplain of the river to facilitate riparian restoration goals and to prevent further resource damage. Restoration actions would remove non-native fill material, re-contour the topography, and plant native vegetation. The redesigned parking area would be formalized to provide a total of 550 parking spaces. Northside drive would be realigned to the south edge of the parking area where it would connect with Sentinel Drive and continue west to Yosemite Falls and park exits. Consolidating the parking to the north of Northside Drive, with new and improved walkways to Yosemite Village, would eliminate vehicle and pedestrian conflicts. A new bus passenger unloading area would be established east of the Village market and five new spaces provided for bus parking. The Concessioner General Office, Concessioner Garage, Arts and Activities Center (former bank building) would be removed, while the Village Sport Shop would be repurposed as a visitor contact station.

The area of disturbance for improvements at Camp 6 in Alternative 2 would cover approximately 22 acres and include 14 acres of clearing and grubbing, 1.2 acres for existing building removal, 1,000 square feet for the new restroom, 5.4 acres of pavement removal, 1.7 acres of new roadway, 2.4 acres for new parking, 14,900 square feet of utility service trenching, and 38,000 square feet for new pedestrian pathways. Construction staging would cover an area of approximately 2 acres.

### ***Yosemite Lodge Parking Area***

In Alternative 2, the area west of Yosemite Lodge, currently used as parking for tour buses, transit buses and for overnight guests would be re-developed to provide 150 day-use parking spaces, parking for 15 buses, and a new 3,000 square foot comfort station. The area east of this parking lot and immediately west of the main lodge building and courtyard would be repurposed to a walk-in campground. The existing wellness center, linen storage and laundry buildings would be removed. Ground disturbance within a 11.9 acre footprint west of the Lodge would include 9 acres of clearing and grubbing, 55,850 square feet of existing building and pavement removal, 8,300 square feet of utility service trenching, 2.9 acres for parking, and 2,500 square feet for pedestrian pathways. Construction staging for the redesigned parking area and the campground would take place over a 2 acre area within the existing footprint. Existing vegetation would be retained to separate and screen parking bays while bioswales would serve to filter and treat storm water run-off.

### ***Yosemite Lodge Housing***

In Alternative 2, the temporary modular housing at Highland Court and the Thousand Cabins would be removed. All lodging, parking and guest facilities associated with the Yosemite Lodge complex would also be removed and the site converted to a campground and day-use area within the existing developed footprint.





Huff House Employee Housing  
Replace temporary housing with permanent facilities,  
164 beds and 164 parking spaces

- 1 Construct 4 two-story buildings for 32 occupants, 8 occupants per building.
- 2 Construct 11 two-story buildings for 132 occupants, 12 occupants per building.
- 3 Provide common recreational area, approximately 3,600 square feet.
- 4 Build plaza areas and walkways with site furnishings, accent paving, and enhanced landscaping.
- 5 Construct a shuttle bus stop.
- 6 Remove ice rink and bicycle rentals. Construct an employee parking facility with 164 spaces.
- 7 Retain historic residence for housing purposes.

Boys Town Guest Lodging  
Replace tent cabins 78 permanent guest cabins  
and 78 parking spaces

- 8 Construct 25 duplex buildings replicating historic cabins, or 50 units subtotal.
- 9 Construct 7 four-plex buildings, or 28 units subtotal.
- 10 Relocate the Campground Reservation Center. Provide 8 parking spaces.
- 11 Construct a roadway to connect Curry Village and East Valley Campgrounds, with 78 guest parking spaces.

Curry Orchard Parking Area

- 12 Improve parking area with 420 spaces and landscape buffers with trees and bioswales that will treat storm water run-off.

Meadow Restoration Area

- 13 Remove Stoneman Road and adjacent recreation trail, extend boardwalk from existing terminus (at Stoneman Road) to Curry Village Pavilion area. Improve hydrology, remove invasive species, promote weed control and plant native species. Provide pedestrian walkways.

Existing Curry Village Visitor Services

- 14 Retain existing historic cabins and Stoneman Cottage (65 lodging units).
- 15 Retain existing Curry Pavilion.
- 16 Retain 290 tents.

\*These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



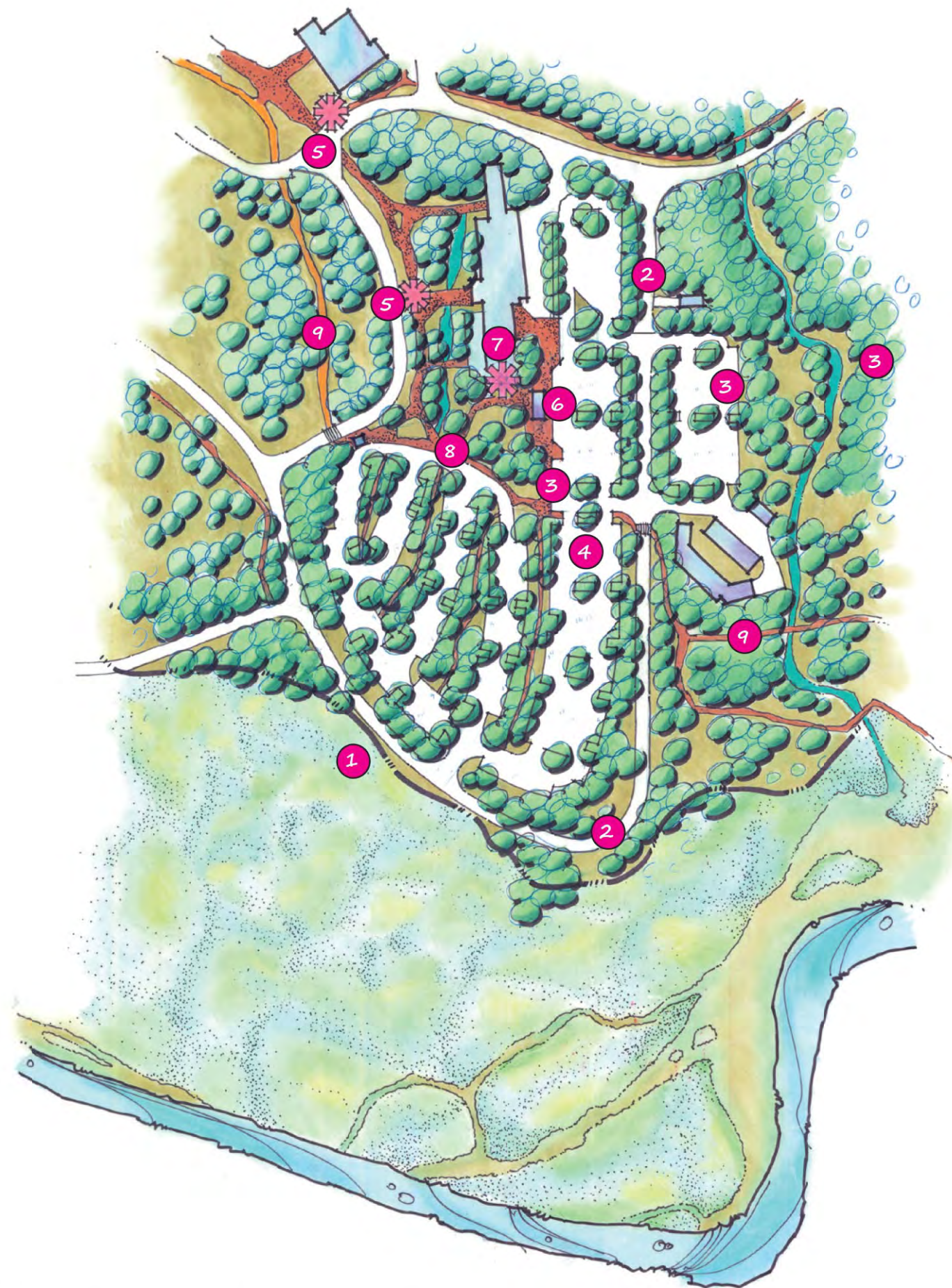
## Alternative 2 Conceptual Site Drawing for Curry Village

Yosemite National Park  
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- 1 Use the 10-year floodplain to establish limits of development. Restore wetlands and meadow.
- 2 Reroute Northside Drive to conform to the floodplain extent and south edge of day-use parking area. Northside Drive is eliminated east of this location.
- 3 Eliminate Concessioner General Office and Garage between the Village Store and Ahwahnee Meadow, providing more space for visitor parking. Employee dormitories and housing would be removed in Alternative 2 (as drawn), but retained in Alternative 3.
- 4 Provide 550 day-use parking spaces in between Northside Drive and Yosemite Village. Integrate landscaped areas to retain large numbers of trees, and include bioswales that will treat storm water run-off. Improve access through a system of pedestrian pathways leading to the Yosemite Village mall.
- 5 Retain existing shuttle stops on Visitor Center Loop Drive.
- 6 Establish bus passenger unloading area east of the Yosemite Village mall.
- 7 Replace Village Sport Shop with visitor contact station.
- 8 Eliminate Art Activity Center and improve pedestrian access.
- 9 Improve pedestrian connections and bike paths east and west of the day-use parking area.



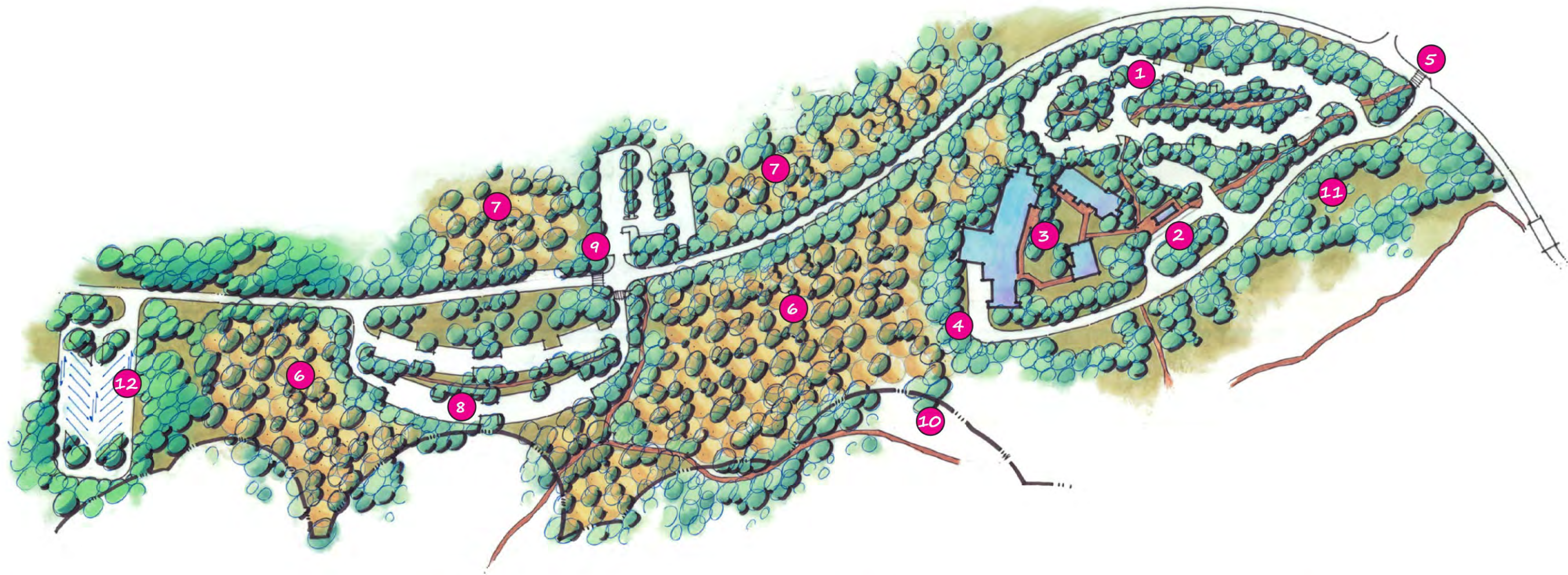
**Alternatives 2 and 3**  
**Conceptual Site Drawing for**  
**Yosemite Village Day-use Parking Area**  
 Yosemite National Park  
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\*These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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- 1 Construct 250 day-use parking spaces. Remove all existing lodging units. Locate new parking within disturbed area. Maintain existing vegetation as buffers to separate and screen parking bays, provide pedestrian pathways and bioswales that will retain storm water run-off.
- 2 Construct shuttle stop with shelter.
- 3 Retain core visitor service buildings and courtyard. Limit visitor services to food service, interpretive displays and restroom facilities.
- 4 Modify food service delivery area.
- 5 Move pedestrian crossing to Yosemite Falls west of the existing intersection.
- 6 Create 104 walk-in campsites. Provide 100 standard campsites and 4 group walk-in sites. Occupancy is limited to 6 campers per site. Standard walk-in campsite is 3,850 square feet (70-foot diameter), including 1,200 square feet of clearance with a 15-foot perimeter buffer. Of the 104 sites, 4 are group walk-in sites.
- 7 Retain 35 existing walk-in campsites at Camp 4. Construct 35 additional walk-in sites opposite existing parking facility.
- 8 Construct a total of 191 parking spaces; 41 spaces for Camp 4 and 150 spaces for the walk-in camp sites. Maintain existing vegetation as buffers to separate and screen parking bays, provide pedestrian pathways and bioswales that will retain storm water run-off.
- 9 Construct a shuttle bus stop at Camp 4.
- 10 Protect and enhance a 150-foot riparian buffer.
- 11 Remove employee housing and restore vegetation and hydrological processes.
- 12 Construct 15 tour bus parking spaces.



## Alternative 2

### Conceptual Site Drawing for Yosemite Lodge and Camp 4

Yosemite National Park

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## **ALTERNATIVE 3: DISPERSED VISITOR EXPERIENCE AND EXTENSIVE RIVERBANK RESTORATION**

### **Overview**

The guiding principles of Alternative 3 would include restoration of large portions of the floodplain and the riparian area within 150 feet of the river. This alternative would accommodate much lower maximum visitor use levels than today, and offer fewer commercial services and facilities. Visitor use levels would be managed to allow for dispersed visitor experiences free of crowding or congestion.

Management actions in Alternative 3 would:

- Restore 302 acres of meadow and riparian habitat.
- Slightly reduce the campsite inventory in all river segments (-3%) and slightly increase campsite inventory in Yosemite Valley (+2%).
- Significantly reduce the lodging inventory in all river segments (-38%) and in Yosemite Valley (-40%).
- Reduce day-use parking for Yosemite Valley (-32%).
- Reduce commercial services.
- Make significant changes to the traffic circulation pattern in Yosemite Valley to accommodate ecological restoration goals and reduce traffic congestion.
- Accommodate approximately 13,200 visitors per day in East Yosemite Valley.
- Continue to manage overnight use through wilderness quotas, reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through permits and a reservation system required during peak summer season.

### ***Actions to Protect and Enhance River Values***

Alternative 3 would protect and enhance river values through extensive ecological restoration that would include some portions of the 100-year floodplain and riparian and meadow habitat corridorwide. Similar to Alternatives 2 and 4, it would prioritize enhancement of ecological river values over the retention of existing circulation patterns and infrastructure. Ecological restoration actions would target priority meadow and riparian habitat for enhancement, including the area currently occupied by the Wawona Golf Course and the dynamic 10-year floodplain area formerly occupied by the Upper and Lower River Campgrounds. The free-flowing condition of the river would be enhanced by removing three bridges within the bed and banks that constrict flow during high-water events. Hydrologic connectivity of meadows to the riparian floodplain would be enhanced through the removal of certain road segments that bisect meadows.

Cultural and scenic values would be protected and enhanced as described under “Actions Common to Alternatives 2-6” (beginning on page 8-53). Recreational values would additionally be protected and enhanced under Alternative 3 by reducing facilities and crowding in the wilderness above Nevada Fall, and by improving access to key attraction sites and managing boating to improve dispersed recreation along the river in Yosemite Valley. Table 8-20 provides a summary of the proposed ecological restoration actions and the reasons for those proposed actions.

**TABLE 8-20: ADDITIONAL ACTIONS TO PROTECT AND ENHANCE RIVER VALUES, ALTERNATIVE 3**

<b>Ecological Restoration Actions (Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values)</b>	
<b>Corridorwide</b>	
<b>Ecological Restoration Acreage</b>	164 acres (common to all) plus an additional 138 acres (refer to Appendix E for specific locations)
<b>Riprap to be Removed</b>	5,700 linear feet (common to all) plus an additional 435 feet (refer to Appendix E for specific locations)
<b>Segment 1: Wilderness above Nevada Fall</b>	
	<ul style="list-style-type: none"> <li>Remove Merced Lake High Sierra Camp and restore natural floodplain conditions.</li> </ul>
<b>Segment 2: Yosemite Valley</b>	
<b>Free Flow / Geologic/Hydrologic Values</b>	<ul style="list-style-type: none"> <li>Remove Ahwahnee, Sugar Pine, and Stoneman bridges to enhance the free-flowing condition of the river.</li> </ul>
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore 36.5 acres of habitat in former Upper and Lower River campgrounds.</li> <li>Move Yosemite Village Day-use Parking Area north outside the 10-year floodplain.</li> <li>Ecologically restore riparian habitat within 150 feet of the river at Backpackers Camp and portions of North Pines, Lower Pines, and Wawona Campgrounds.</li> <li>Remove all of Housekeeping Camp and portions of Yosemite Lodge from the 100-year floodplain and restore natural floodplain conditions.</li> </ul>
<b>Meadow Restoration</b>	<ul style="list-style-type: none"> <li>Remove 900 feet of Northside Drive through Ahwahnee Meadow to enhance connectivity of the meadow and floodplain</li> <li>Remove 1,335 feet of Southside Drive through Stoneman Meadow to enhance connectivity of the meadow and floodplain</li> </ul>
<b>Segment 7 : Wawona</b>	
<b>Meadow Restoration</b>	<ul style="list-style-type: none"> <li>Ecologically restore 42-acre Wawona Golf Course to meadow habitat</li> </ul>
<b>Recreational Values</b>	
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Wilderness Recreation</b>	<ul style="list-style-type: none"> <li>Covert Merced Lake High Sierra Camp to temporary stock camp with reduced overnight capacity and convert area to designated Wilderness.</li> <li>Reduce zone capacities and convert overnight use to dispersed camping.</li> </ul>

### *User Capacity, Land Use and Facilities Management*

Alternative 3 would focus on providing a dispersed visitor experience, with marked reduction in commercial services and facilities. The overall visitor use levels would be lower than current levels to allow for increased resource restoration and reduced crowding and congestion in the most popular areas of the river corridor. Table 8-21 provides a summary of user capacities by use type and location.

**TABLE 8-21: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 3**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 3	
	Unit Type	Units	People	Units	People
<b>Wilderness Above Nevada Fall</b>					
Visitor Overnight Use	Zone Capacities & Beds	380	380	260	260
Visitor Day Use	Day Hikers	350	350	350	350

**TABLE 8-21: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 3**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 3	
	Unit Type	Units	People	Units	People
Employee Housing	Employee Beds	15	15	10	10
Administrative Day Use	Day Patrols	5	5	5	5
<b>Yosemite Valley</b>					
Visitor Overnight Use	Rooms & Campsites	1,500	6,564	1,098	5,027
Visitor Day Use	Parking Spaces & Buses	-	8,272	-	6,289
Employee Housing	Employee Beds	1,315	1,315	1,086	1,086
Administrative Day Use	Parking Spaces	166	332	166	332
<b>Merced Gorge</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	180	869	180	869
Employee Housing	Employee Beds	9	9	9	9
Administrative Day Use	Parking Spaces	2	4	2	4
<b>El Portal</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	214	740	214	740
Employee Housing	Employee Beds	192	192	223	223
Administrative Day Use	Parking Spaces	610	1,220	610	1,220
<b>South Fork Above Wawona</b>					
Visitor Overnight Use	Permits	20	20	20	20
Visitor Day Use	Day Hikers	6	6	6	6
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1
<b>Wawona</b>					
Visitor Overnight Use	Rooms & Campsites	203	865	176	703
Visitor Day Use	Parking Spaces & Buses	-	1,295	-	1,321
Employee Housing	Employee Beds	121	121	121	121
Administrative Day Use	Parking Spaces	30	60	30	60
<b>South Fork Below Wawona</b>					
Visitor Overnight Use	Permits	3	3	3	3
Visitor Day Use	Day Hikers	3	3	3	3
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1

## Visitor Overnight Capacity

### *Camping*

The campsite inventory in the Merced Wild and Scenic River corridor, including Yosemite Valley, would be reduced by approximately 3% as a result of natural and cultural resource protection actions. All campsites within the 150 feet of the river would be removed. Campsite losses would be offset with the addition of new camping adjacent to Upper Pines Campground and east of Camp 4, as well as new sites west of Backpackers Camp and west of Yosemite Lodge. Under Alternative 3, the total number of campsites in Yosemite Valley would increase to 477, and the total number of campsites available in the corridor would be 549. Table 8-22 provides a summary of the proposed changes to camping and the reasons for those proposed changes.

**TABLE 8-22: CAMPING FACILITIES- ALTERNATIVE 3**

Existing Locations	Alt 1 (No Action)	Alt 3	Details
Backpackers	25 sites	0 sites	25 walk-in sites removed, of which 21 are within 150 feet of the river; 16 of these sites would be relocated west of Backpackers
Camp 4	35 sites	35 sites	No change to this National Historic Register Site
Lower Pines	76 sites	61 sites	15 sites within 150 feet of the river removed
North Pines	86 sites	52 sites	34 sites within 150 feet of the river removed
Upper Pines	240 sites	238 sites	2 sites removed for cultural resource concerns
Yellow Pine Administrative	4 sites	4 sites	No changes to these group administrative sites
Wawona Campground	99 sites	72 sites	27 sites within 150 feet of the river or in culturally sensitive areas removed
<b>Total Existing Locations</b>	<b>565 sites</b>	<b>462 sites</b>	
New Locations	Alt 1	Alt 3	Details
West of Backpackers	0 sites	16 sites	16 walk-in sites relocated from Backpackers Camp to less sensitive area outside 100-year floodplain
East of Camp 4	0 sites	35 sites	35 walk-in sites constructed in area east of Camp 4
Upper Pines	0 sites	36 sites	36-site RV loop constructed
<b>Total New Camping</b>	<b>0 sites</b>	<b>87 sites</b>	
<b>Total Camping in Corridor</b>	<b>565 sites</b>	<b>549 sites</b>	

### *Lodging*

In-park lodging availability would be reduced by approximately 37% as compared to Alternative 1. Management actions related to lodging would focus on removing lodging units from the 100-year floodplain at Yosemite Lodge and Housekeeping Camp, and in Wilderness. All permanent infrastructure at the Merced Lake High Sierra Camp would be removed. A temporary pack camp with a maximum capacity of 15 people would be sanctioned at the location of the former High Sierra Camp, accommodating limited overnight lodging in this location while still allowing the area to be converted to designated Wilderness. No new hard-sided lodging would be constructed in Alternative 3 in any part of the river corridor. As a result of these actions, the in-park lodging inventory would be reduced from 1,160 units to 725 units. Table 8-23 provides a summary of the proposed changes to lodging and the reasons for those proposed changes.



**TABLE 8-23: LODGING FACILITIES- ALTERNATIVE 3**

Wilderness	Alt 1 (No Action)	Alt 3	Details
Merced Lake High Sierra Camp	22 units (60 beds)	0 units (15 people)	All permanent infrastructure removed. Wilderness lodging facility converted to 15-person <u>temporary</u> pack camp.
Yosemite Valley	Alt 1	Alt 3	Details
Ahwahnee Hotel	123 rooms	123 rooms	No change at this National Historic Landmark
Housekeeping Camp	266 tent cabins	0 tent cabins	Remove all 266 units from 100-year floodplain
Curry Village	400 units	355 units (290 tents and 65 hard-sided units)	<ul style="list-style-type: none"> <li>Retain 290 tents</li> <li>Retain 18 units at Stoneman House</li> <li>Retain 47 cabin-with-bath units</li> <li>At Boys Town, Southside Drive is re-routed and the area restored.</li> </ul>
Yosemite Lodge	245 rooms	143 rooms	Remove 102 rooms (four buildings) from 100-year floodplain
Wawona	Alt 1	Alt 3	Details
Wawona Hotel	104 rooms	104 rooms	No change at this National Historic Landmark
<b>Total Lodging in Corridor</b>	<b>1,160 units</b>	<b>725 units</b>	
<b>* El Portal:</b> Private accommodations exist but are not on NPS land; therefore, they are not listed here.			

### Visitor Day Use Capacity and Access Improvements

Day-use parking capacity in Yosemite Valley would be reduced by 32% compared to current levels. For day use, restrictions would be set due to proposed reductions in day-use parking in Yosemite Valley. Day-use capacity would be actively managed and potentially restricted during peak use season (May through September). A day use permit system would be implemented in this alternative during the peak summer season. Table 8-24 provides a summary of the total number of parking spaces for each relevant segment of the corridor.

**TABLE 8-24: NUMBER OF DAY-USE PARKING SPACES IN SEGMENTS – ALTERNATIVE 3**

Location	Alt 1 (No Action)	Alt 3
Segment 2: Yosemite Valley	2,337 spaces	1,597spaces
Segment 3: The Gorge	180 spaces	180 spaces
Segment 4: El Portal	214 spaces	214 spaces
Segment 7: Wawona	290 spaces	290 spaces
<b>Total Day-use Parking</b>	<b>3,021 spaces</b>	<b>2,281 spaces</b>

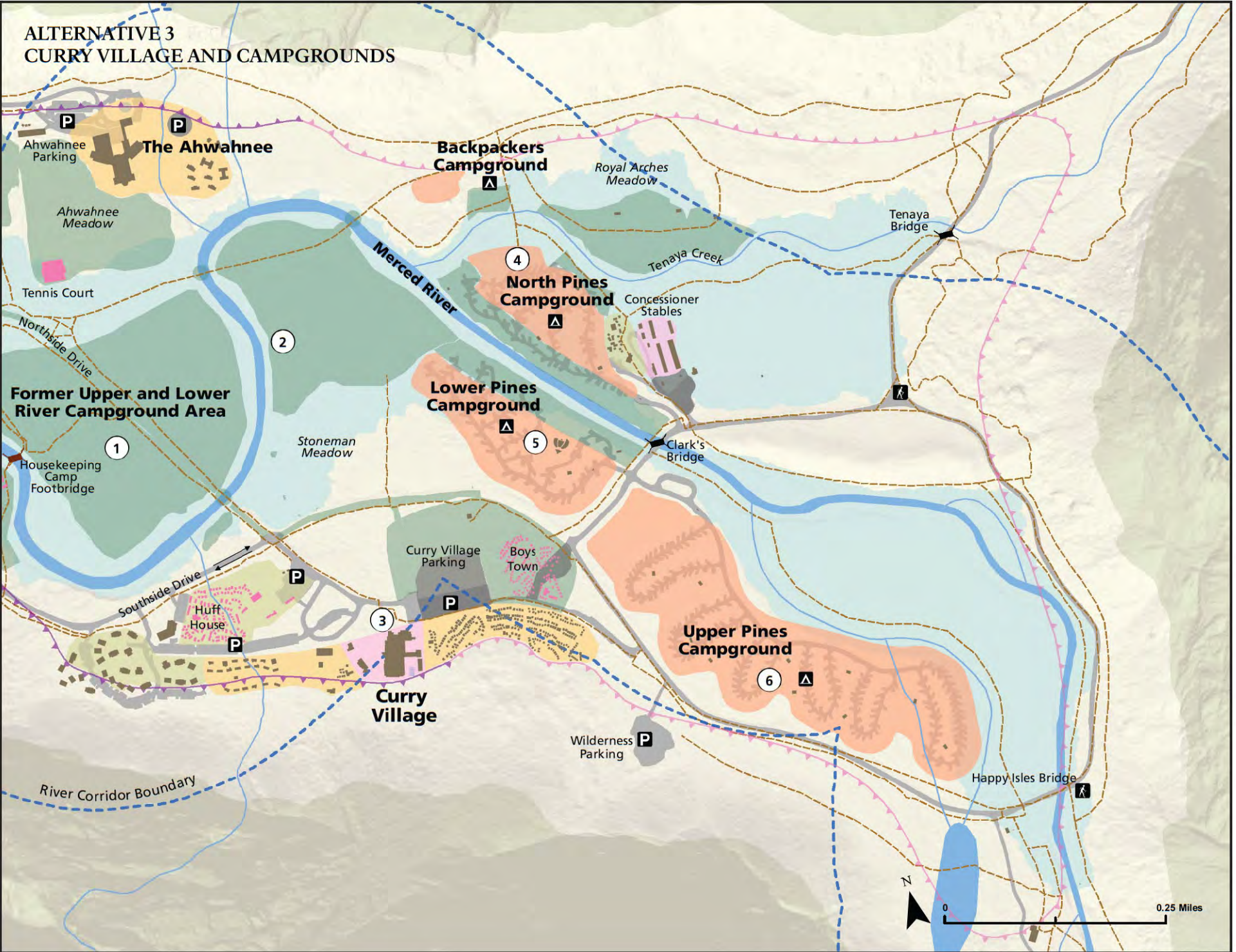
The most significant changes to parking and circulation would take place in the vicinity of Yosemite Village Day-use Parking Area and Yosemite Lodge. Day use visitors would park at a redesigned parking area at Yosemite Village Day-use Parking Area, with a total of 550 parking spaces, and additional day-use parking is added to the west of Yosemite Lodge. Total parking for East Yosemite Valley (including day, overnight and administrative uses) would be approximately 4,300 spaces.

Transit services would remain unchanged on the Highway 140, and Highway 120 East corridors; service would be reduced to one round-trip per day on the Highway 120 West corridor, and one round-trip run per day would be added to the Highway 41 corridor. All within-park shuttle services would remain the same, and the East Valley shuttle would decrease shuttle intervals to 5 minutes.

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# ALTERNATIVE 3: DISPERSED VISITOR EXPERIENCES AND EXTENSIVE RIVERBANK RESTORATION



## Legend

Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment

## EAST YOSEMITE VALLEY: CURRY VILLAGE AND CAMPGROUNDS

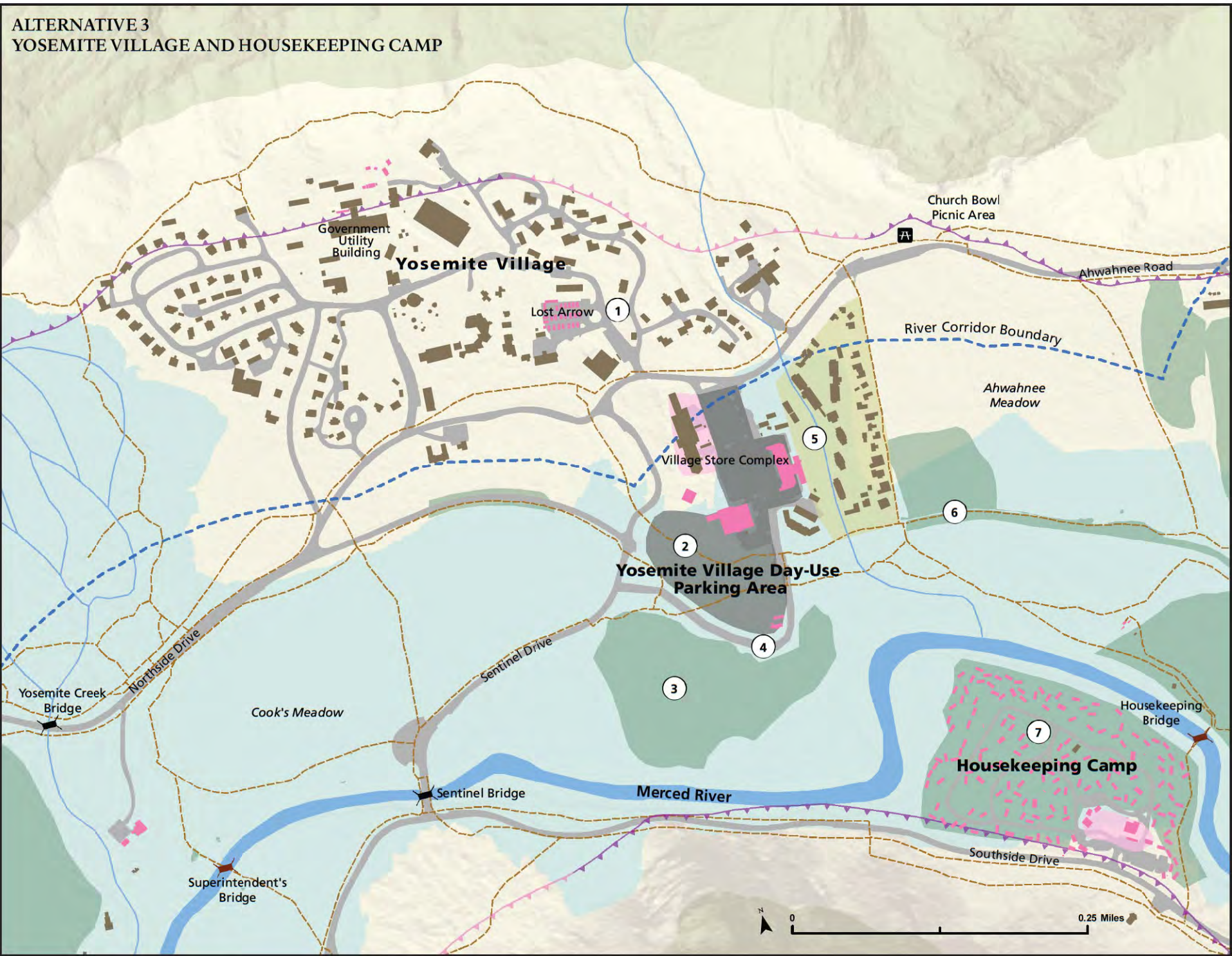
- Former Upper and Lower River Campground Area**
  - Ecological Restoration: Restore 35.6 acres of floodplain habitat within the 10-year floodplain. Restore natural floodplain topography by removing remaining asphalt and re-establishing seasonal channels, and revegetate with native plants. Remove Lower River amphitheater. Temporarily fence restoration areas to allow for recovery.
- River Reach between Bridges**
  - Ahwahnee and Sugar Pine Bridges: Remove the Ahwahnee and Sugar Pine bridges, and associated berm to enhance the free-flowing condition of the river. Restore area to natural conditions. Re-route the multiple-use trail north of the river.
  - Stoneman Bridge: Remove Stoneman Bridge to enhance free-flowing conditions of the river. Restore area to natural conditions. Reconfigure Southside Drive as a two-way road, remove the road segment through Stoneman Meadow, and re-design the intersection at Sentinel and Southside Drive.
- Curry Village Area**
  - Ecological Restoration: Remove Southside Drive through Stoneman Meadow to enhance the hydrologic connectivity of the meadow. Re-align road through the Boys Town area instead of the meadow, and restore remaining area to natural conditions. Extend meadow boardwalk (up to 275 feet) to Curry Village.
  - Curry Orchard Parking Area: Provide 300 parking spaces. Ecologically restore part of the existing parking area to accommodate Stoneman Meadow restoration. Re-design parking area using best management practices to increase drainage to Stoneman Meadow and protect water quality. Remove apple trees to mitigate human-bear interactions and plant native vegetation.
  - Lodging: Total would be 355 guest units, including: 290 tents in Curry Village retained; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained. At Boys Town, Southside Drive would be re-routed to facilitate the restoration of Stoneman Meadow and the remaining area at Boys Town ecologically restored.
- North Pines Campground Area**
  - Ecological Restoration at Campgrounds: Remove campsites within 150 feet of the river at North Pines, Backpackers, and Lower Pines campgrounds. Restore to 12 acres of riparian habitat. Designate a formal river access point at North Pines campground.
  - North Pines Campground: Retain 52 campsites. Remove 34 sites that are within 150 feet of river.
  - Backpackers Campground: Remove all 25 walk-in sites in the campground, of which 21 are within the 150-foot riparian buffer. Partially replace sites removed with a new campground with 16 walk-in sites west of Backpackers Campground.
  - Concessioner Stables in Yosemite Valley: Reduce the footprint of the stables to provide staging for temporary pack camp operation at Merced Lake High Sierra Camp and overflow parking for campgrounds. Retain associated housing (25 beds).
- Lower Pines Campground Area**
  - Campground Sites: Retain 61 campsites and remove 15 sites from within 150 feet of river.
- Upper Pines Campground Area**
  - Campground Sites: Retain 238 campsites. Remove two sites for sensitive resource concerns.
  - New RV Loop: Construct a new campground loop with 36 RV sites.



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# ALTERNATIVE 3: DISPERSED VISITOR EXPERIENCES AND EXTENSIVE RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE VILLAGE AND HOUSEKEEPING CAMP

1. Lost Arrow: Remove temporary employee housing. Re-establish an administrative parking lot to accommodate 50 spaces.
2. Yosemite Village Day-use Parking Area: Move the parking area outside of the dynamic 10-year floodplain. Formalize this parking area to using best management practices to accommodate 550 parking places and protect water quality.
3. Ecological Restoration at Yosemite Village Day-use Parking Area: Remove nonnative fill material and restore meadow and floodplain habitat within the dynamic 10-year floodplain.
4. Pedestrian/Vehicle Conflicts: Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area. Consolidate parking to the north of the road and provide walkways leading to Yosemite Village separating vehicle and pedestrian traffic and eliminating conflicts. This re-designed traffic circulation patterns would not require roundabouts or a pedestrian undercrossing.
5. Concessioner Employee Housing: Create a 50-foot setback from Indian Creek. Ecologically restore the riparian habitat and protect using restoration fencing. Retain Ahwahnee Row and Tecoya employee housing.
6. Ahwahnee Meadow Restoration: Remove 900 feet of road through Ahwahnee Meadow and relocate the bike path to the south, restoring hydrologic connectivity between the meadow and river. Re-route the formal foot trail in Ahwahnee Meadow so it does not pass through wetlands. Restore meadow topography and native vegetation in original trail corridor.
7. Housekeeping Camp Lodging: Remove all lodging units and amenities including shower houses, laundry, office, and grocery store. Convert Housekeeping Camp to a day-use river access point and picnic area. Retain one restroom for day users. Restore 16.8 acres of floodplain and riparian ecosystem.

**Legend**

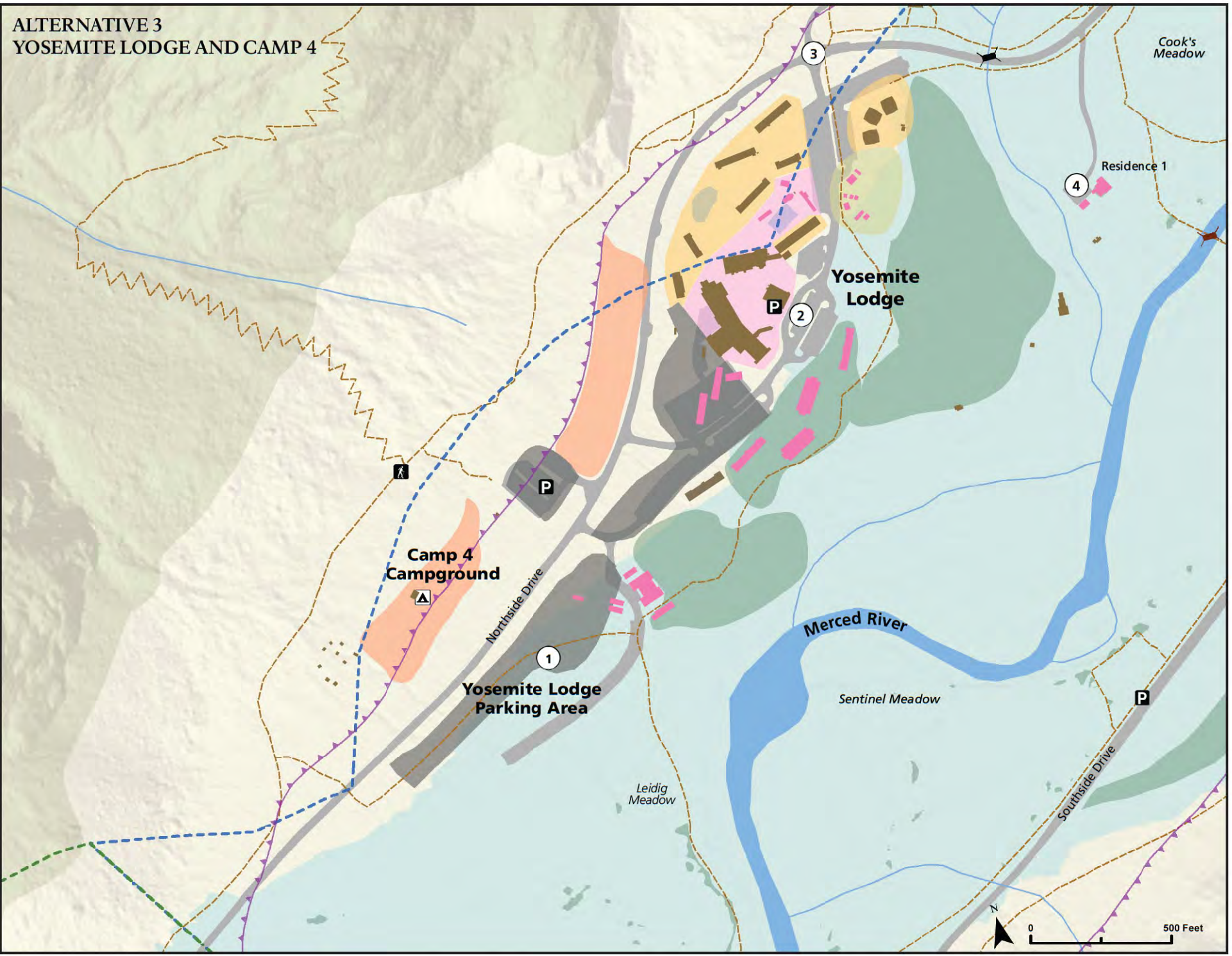
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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# ALTERNATIVE 3: DISPERSED VISITOR EXPERIENCES AND EXTENSIVE RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE LODGE AND CAMP 4

- 1. West of Yosemite Lodge**
  - Parking:** Construct additional 150 day-use parking spaces southwest of Yosemite Lodge. This includes 15 spaces for tour bus parking. Parking redevelopment will incorporate best management practices to protect water quality.
- 2. Yosemite Lodge Area**
  - Ecological restoration:** Remove four Yosemite Lodge lodging buildings (in addition to other structures listed in actions common to all alternatives) from the 100-year floodplain and restore to natural conditions (3.3 acres). Also, restore riparian and floodplain ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate one service road to the well house and parking. Remove non-native fill, decompact soils and plant riparian plant species (10.9 acres).
  - Lodging:** Retain 143 units at Yosemite Lodge with associated parking.
  - Services and Facilities:** Retain the Yosemite Lodge Food Court and Mountain Room Dining Room and Bar. Remove the post office, swimming pool, bike rentals, snack stand, and NPS Volunteer Office. Relocate the concessioner housekeeping and maintenance buildings.
  - Tour buses:** Remove temporary housing complex at Highland Court and establish a tour bus drop-off area with three bus loading spaces.
  - Concessioner Housing:** Construct two new concessioner housing areas for 104 employees and construct 78 employee parking spaces. (Common to all alternatives is to remove housing at Highland Court and at the Thousands Cabins.)
- 3. Yosemite Falls Intersection**
  - Traffic Congestion:** Move the pedestrian crossing between Yosemite Lodge and Yosemite Falls to an on-grade (street level) pedestrian crossing west of the intersection of Northside Drive and Yosemite Lodge Drive to help alleviate pedestrian/vehicle conflicts and associated traffic congestion.
- 4. Residence 1**
  - Residence 1:** Relocate this historic structure, also called the Superintendent's House, to the NPS housing area and rehabilitate the building per the Secretary of Interior's Standards for the Treatment of Historic Properties and the Historic Structures Report. Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.

**Legend**

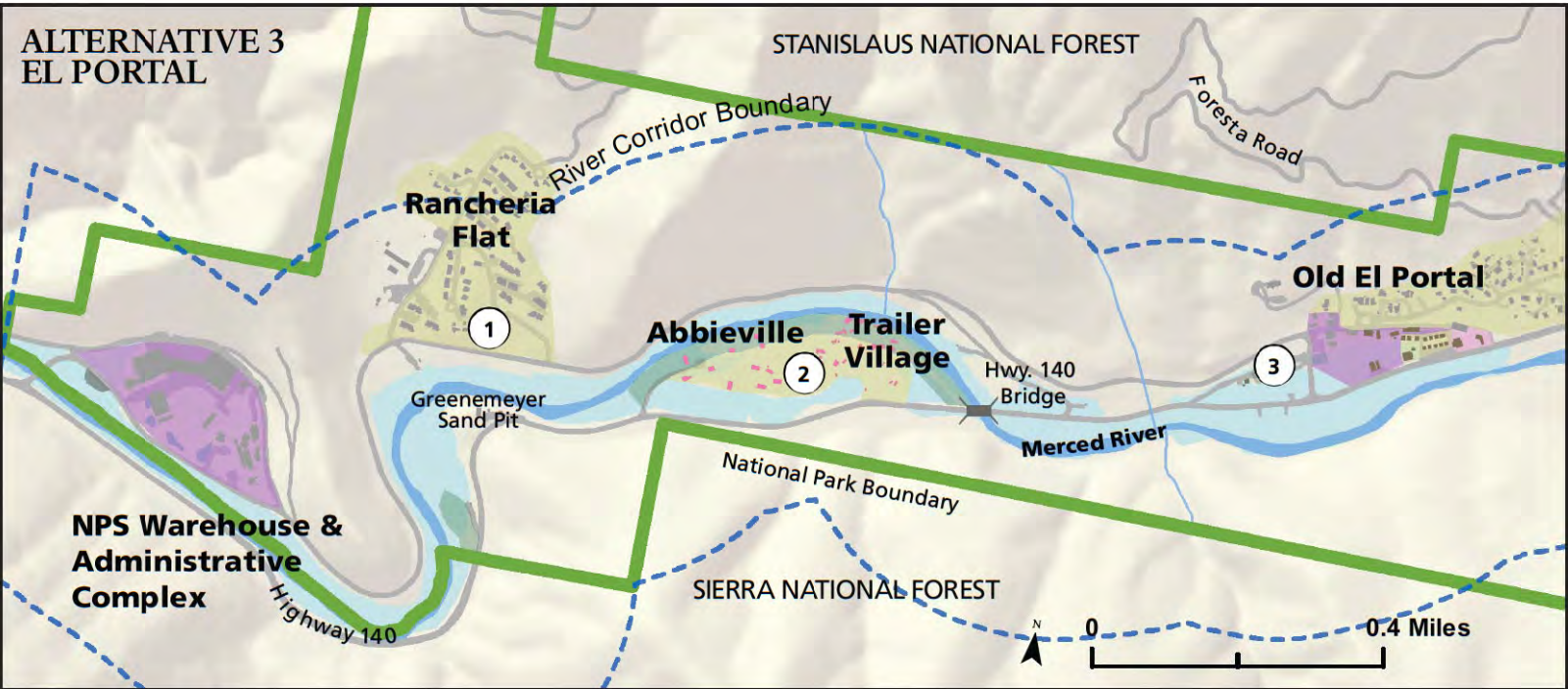
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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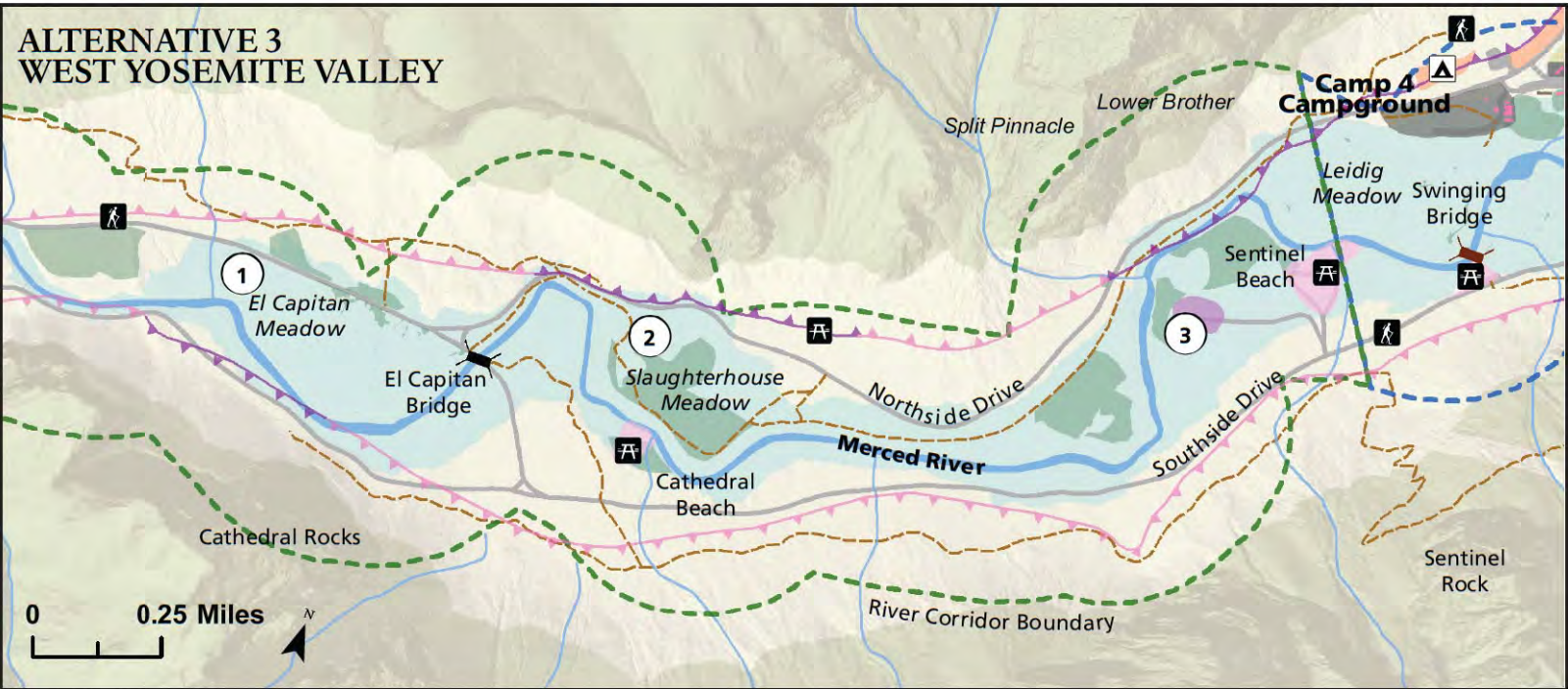


# ALTERNATIVE 3: DISPERSED VISITOR EXPERIENCES AND EXTENSIVE RIVERBANK RESTORATION



## EL PORTAL

1. Rancheria Flat
  - Employee Housing: To replace temporary housing units that will be removed from Yosemite Valley, construct one dormitory for 12 employees plus units for seven additional employees, for a total of 19 employee beds, away from sensitive resources.
2. Abbieville and Trailer Village Area
  - Abbieville and Trailer Village Housing: Remove or relocate 36 existing private residences. Continue to provide for housing land use for 40 employees and volunteers at this location. As homes within the 150-foot riparian buffer become vacant, ecologically restore these areas.
3. El Portal Village Center
  - Valley Oak Restoration: Restore the rare floodplain community of valley oaks in Old El Portal through implementation of best management practices. Create a valley oak recruitment area of 2.25 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.
  - Odger's Fuel Storage Facility: Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompact soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.



## WEST YOSEMITE VALLEY

1. El Capitan Meadow Area
  - El Capitan Meadow Ecological Restoration: Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural conditions. Use restoration fencing and signing to designate appropriate meadow access points. No boardwalks are constructed in this alternative.
2. Valley Loop Trail
  - Trail Re-Route: Reroute trail through Slaughterhouse Meadow out of wetland habitat to an upland area. Move a 780-foot section of the trail through Bridalveil Meadow to the base of the Valley Loop Road shoulder.
3. Yellow Pine Campground
  - Administrative-Use Campground: Retain Yellow Pine Campground's four group sites (serving up to 120 people) for administrative use.

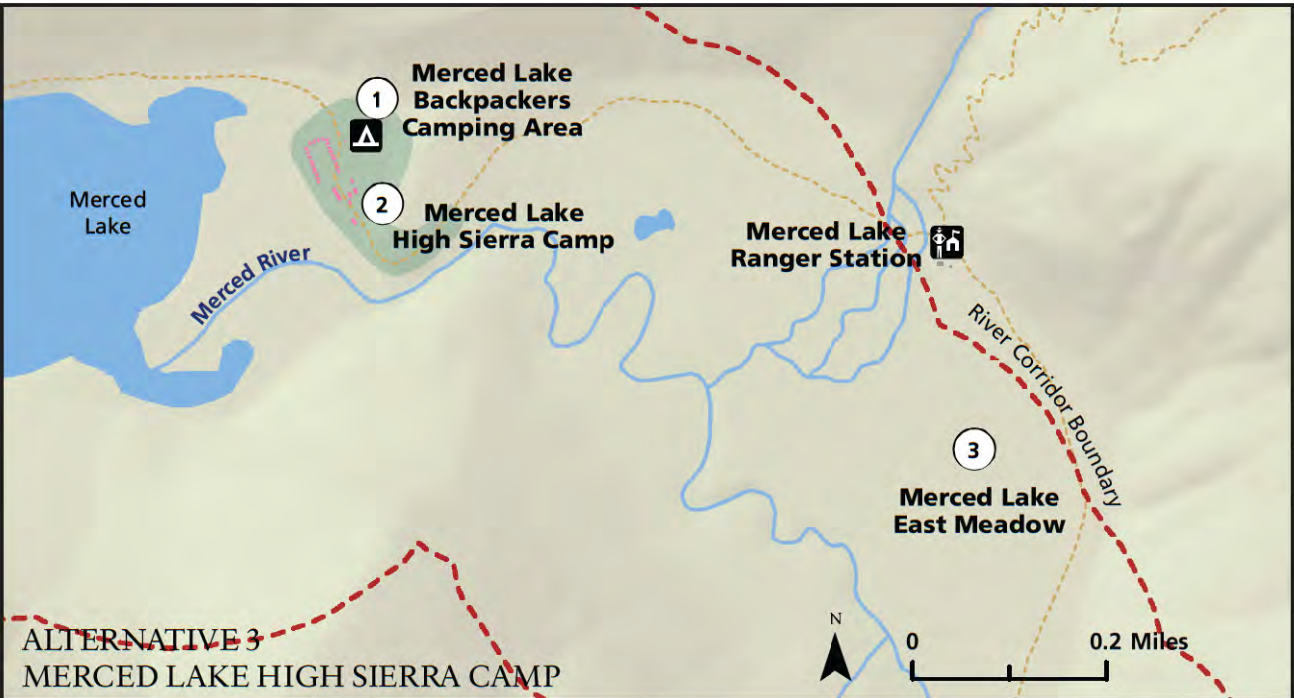
## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		



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# ALTERNATIVE 3: DISPERSED VISITOR EXPERIENCES AND EXTENSIVE RIVERBANK RESTORATION



## MERCED LAKE HIGH SIERRA CAMP

1. Merced Lake Backpackers Camping Area: Discontinue designated camping in this camping area but allow dispersed camping in the area of the former Merced Lake Backpackers Camping Area and the Merced Lake High Sierra Camp. Remove waste water system. Replace flush toilets with composting toilets.
2. Merced Lake High Sierra Camp: Convert Merced Lake High Sierra Camp to a temporary pack camp with a maximum group size of 15 people. Remove permanent infrastructure, including buildings, water system and septic system. Ecologically restore the area and convert area to designated Wilderness.
3. Merced Lake East Meadow: Develop preliminary grazing capacities for the meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed to protect meadow.

## OTHER SEGMENT 1 CAMPING AREAS

- Little Yosemite Valley: Discontinue designated camping but allow dispersed camping in this area. Remove all infrastructure, except for the composting toilets.
- Moraine Dome: Discontinue designated camping but allow dispersed camping in this area.



## WAWONA

1. Wawona Campground: Retain 64 campsites and one group site. Remove 32 sites that are located within the 100-year floodplain or culturally sensitive areas.
2. Wawona Meadow Restoration: Remove golf course and restore to meadow conditions. Retain spray field associated with waste water treatment facility.
3. Wawona Stables: Eliminate stable operation and commercial day rides. Relocate two stock-use campground sites from a sensitive resource area to the existing stables area.

## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		

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## Detailed Description of Alternative 3 by Segment

### *Segment 1: Wilderness above Nevada Fall (Wild Segment)*

#### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 3 would include the following action to protect and enhance river values:

##### *Biological Values*

- Establish preliminary grazing capacities for Merced Lake East Meadow; monitor, and adapted as necessary.

##### *Recreational Values*

Enhance Wilderness character by replacing the Merced Lake High Sierra Camp with a temporary stock camp and converting this area to designated Wilderness.

- Reduce crowding by converting all designated camping areas to dispersed camping.
- Reduce trailhead quotas for trailheads that lead to Little Yosemite Valley.

#### **User Capacity, Land Use and Facilities Management**

Alternative 3 would reduce the amount of infrastructure in the river corridor in Segment 1, reduce the capacity of the Little Yosemite Valley Wilderness zone, re-purpose the Merced Lake High Sierra Camp as a temporary outfitter camp, and maintain the existing Wilderness zone quotas for all other zones in the river corridor. In addition to the “Actions Common to Alternatives 2-6” (page 8-77), Alternative 3 would include the following actions to manage user capacity, land use, and facilities:

##### *Visitor Activities and Services*

Primary activities in Segment 1 would continue to include hiking and overnight backpacking. Backpackers would continue to have the choice of staying overnight at designated camping areas or dispersing throughout the Wilderness.

Private boating would be allowed in Segment 1 under Alternative 3. Generally, this kind of use would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Put-ins and take-outs would be dispersed and the use level would be unrestricted due to the expected low use levels associated with this remote area of the river.

One overnight commercial group would be allowed per wilderness zone in Segment 1.

##### *Visitor Overnight Capacity*

The Wilderness trailhead quota system would be maintained, with the changes proposed in Table 8-25. Services would be managed as follows under Alternative 3:

- Convert the Merced Lake High Sierra Camp to a temporary pack camp with a maximum of 15 people allowed; remove permanent infrastructure, including the water treatment system, and convert area to designated Wilderness.

## ALTERNATIVES

- Convert the Merced Lake backpackers camping area to dispersed camping; replace the flush toilet with a composting toilet.
- Convert the Little Yosemite Valley designated backpacker camping area to dispersed camping; retain the composting toilet. Reduce the capacity of the Little Yosemite Valley Wilderness zone.
- Eliminate the designated backpacker camping area at Moraine Dome.

**TABLE 8-25: WILDERNESS ZONE CAPACITIES- ALTERNATIVE 3**

Wilderness Zones	Alt 3 Zonewide Capacity	Alt 3 Zone Capacity Specific to the River Corridor
Little Yosemite Valley Zone	<b>75</b> people (-75 people*)	<b>75</b> people (-75 people*)
Merced Lake Zone	<b>50</b>	<b>50</b>
Washburn Lake Zone	<b>150</b>	<b>100</b>
Mount Lyell Zone	<b>50</b>	<b>10</b>
Clark Range Zone	<b>50</b>	<b>10</b>
* Number of people reduced from Alternative 1 (No Action) to Alternative 3		

### *Visitor Day Use Capacity*

Day use access to this segment is addressed under the “Actions Common to Alternatives 2-6.”

### *Administrative Activities*

- Continue current administrative activities, which consist primarily of regular ranger patrols and backcountry utility work as well as occasional trail/restoration crews. These activities are seasonal and minimal in comparison to visitor use and would not affect overall user capacity.

## *Segment 2: Yosemite Valley (Recreational & Scenic Segments)*

### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 3 would include the following action to protect and enhance river values:

#### *Free Flow*

- Remove Stoneman Bridge and restore the riverbanks to natural conditions.
- Remove Sugar Pine and Ahwahnee Bridges and associated berm/ elevated trail connecting them; restore banks to natural conditions; re-route multi-use trail north along the river.

#### *Biological Values*

Alternative 3 would remove all campsites within 150 feet of the high-water mark:

- Remove all existing campsites and infrastructure within 150 feet of the ordinary high-water mark and restore natural floodplain and riparian habitat (12 acres).
  - **Backpackers Camp:** Remove all 25 sites, 21 of which are in the 100-year floodplain (and within 150 feet of the ordinary high-water mark). (Replace 16 sites to the west of the current campground.)



- **North Pines Campground:** Remove 34 sites from within 150 feet of the ordinary high-water mark; restore native riparian vegetation.
- **Lower Pines Campground:** Remove 15 sites from within 150 feet of the ordinary high-water mark; restore native riparian vegetation.
- **Upper Pines Campground:** Retain 238 campsites, 22 of which are in the 100-year floodplain.
- **Former Lower and Upper River Campgrounds:** Remove all abandoned facilities, including the Lower River amphitheater structure, and restore 35.6 acres of natural floodplain topography and riparian/wetland habitat within the 10-year floodplain; temporarily fence restoration areas to allow for recovery.
- **Yosemite Lodge:** Remove four buildings at Yosemite Lodge containing 102 lodging units that are currently within the 100-year floodplain; restore the floodplain to natural conditions.
- **Former Pine and Oak Units:** Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were removed after the 1997 flood) and wellness center while maintaining access to the well house.
- **Yosemite Village:** Move the Yosemite Village Day-use Parking Area northward, out of the 10-year floodplain of the Merced River and outside a designated 50-foot setback from Indian Creek; remove fill material and restore the floodplain to natural conditions.
- **Housekeeping Camp:** Remove all 266 lodging units and associated facilities at Housekeeping Camp (restrooms, shower houses, laundry, grocery store, and office), out of the 100-year floodplain; convert area to a day-use access point. Direct visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off the current eastern river access point located on a steep eroded bank, and actively restore the riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.

Alternative 3 would enhance meadow connectivity by removing segments of roads and trails that currently bisect meadows, interrupting sheetflow and causing habitat fragmentation.

- **Bridalveil Meadow:** Reroute the 780-foot segment of the Valley Loop Trail that currently crosses Bridalveil Meadow closer to the base of the fill slope of the Valley Loop Road.
- **Slaughterhouse Meadow:** Reroute the portion of the Valley Loop Trail to an upland area out of wetlands at Slaughterhouse Meadow.
- **El Capitan Meadow:** Fence the northern perimeter of meadow to protect the restoration area, and designate appropriate access points using boardwalks and viewing platforms.
- **Ahwahnee Meadow:** Remove 900 feet of Northside Drive from Ahwahnee Meadow; relocate the bike path to the south, restoring the meadow and riparian floodplain connectivity; restore meadow contours and native vegetation. Reroute trails through Ahwahnee Meadow so they do not pass through wetlands, consolidating use with the Housekeeping footbridge trail where possible; remove associated fill and restore trails within wetlands.
- **Stoneman Meadow:** Remove the segment of Southside Drive that bisects Stoneman Meadow (1,335 feet); realign Southside Drive through Boys Town. Extend the boardwalk through wet areas to Curry Village (up to 275 feet).

### *Scenic Values*

- Eliminate visual intrusion of Southside Drive through Stoneman Meadow
- Eliminate visual intrusion of Northside Drive through Ahwahnee Meadow.

*Cultural Values*

- Remove four structures from the collective sites representing the prominent historic patterns of development in Yosemite Valley: Sugar Pine Bridge, Ahwahnee Bridge, Stoneman Bridge, and Residence 1 (Superintendent's House).
- Relocate Residence 1 to the NPS housing area and at a minimum stabilize the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995).

*Recreational Values*

- Restrict boating to 50 people per day using private vessels only and restrict use to specific stretches of river in Yosemite Valley. This reduction in boats would enhance dispersed recreation along the river corridor.
- Reduce the available day-use parking and implement at a East Yosemite Valley Day-use Parking Permit system in East Yosemite Valley to reduce crowding at key attraction sites, along roadways, and in parking lots and other facilities.

**User Capacity, Land Use and Facilities Management***Visitor Activities and Services*

Alternative 3 would protect river-related recreational ORVs through infrastructure improvements where necessary, while reducing recreational activities that are not related to recreational ORVs. It would include the following changes to visitor activities and services in addition to those common to Alternatives 2-6 (see page 8-77):

- Allow only private boating in this river segment. Private boats would be limited to the section of river between the Housekeeping Camp and Cathedral Beach. Put-ins and take-outs would be limited to designated locations within Housekeeping Camp, Sentinel Beach, and Cathedral Beach. This use would be monitored by a river patrol ranger and would be limited to 50 trips per day.
- Remove Housekeeping Camp shower houses, restrooms, laundry, and grocery store. (Retain at least one restroom when reconfiguring the area for day use.)
- Continue to provide staging at the Concessioner Stable for temporary pack camp operation at Merced Lake High Sierra Camp; reduce the stable size and provide overflow parking for campgrounds; retain kennel service.
- Remove Curry Village raft rental.

*Visitor Overnight Capacity: Camping*

Camping would be slightly increased under Alternative 3 to 477 sites accommodating 2,958 people per night:

- **Backpackers Camp:** Remove all 25 sites, 21 of which are in the 100-year floodplain. Construct 16 new walk-in campsites west of Backpackers Camp.
- **North Pines Campground:** Retain 52 campsites. Remove 34 sites from within 150 feet of the ordinary high-water mark; restore native riparian communities.
- **Upper Pines Campground:** Retain 238 campsites. Construct a new recreational vehicle campground loop with 36 RV sites.
- **Lower Pines Campground:** Retain 61 campsites. Remove 15 sites from within 150 feet of the ordinary high-water mark.

- **Camp 4:** Retain 35 walk-in campsites and 35 parking spaces. Construct 35 additional campsites east of Camp 4; establish a new parking area (41 spaces) for the Camp 4 campground expansion in the disturbed footprint of the former service station near Camp 4.

### ***Visitor Overnight Capacity: Lodging***

Lodging would be significantly reduced to facilitate ecological restoration, day use, and camping. Lodging would total 621 units accommodating 2,069 people per night. Common to Alternatives 2-6, The Ahwahnee would continue to provide 123 lodging rooms. The following additional lodging would be retained, removed, or constructed under Alternative 3:

- **Curry Village:** Retain 355 lodging units at Curry Village: 290 tents, 18 units at Stoneman House, 47 hard-sided cabins with bath. Remove all existing cabins and associated structures at Boys Town. Provide 300 designated overnight parking spaces at Curry Orchard; restore ecological conditions to part of the existing parking area, removing 50 spaces, to improve natural surface flows to Stoneman Meadow.
- **Housekeeping Camp:** Remove all 266 lodging units and associated facilities from the 100-year floodplain. Convert area to a day use river access point and picnic area. Retain one restroom for day use.
- **Yosemite Lodge:** Retain 143 units lodging units; remove 4 buildings (containing 102 lodging units) from the 100-year floodplain.

Conceptual site drawings road and parking improvements at Boys Town under Alternative 3 have been completed to allow the analysis of impacts of this potential project. See "Conceptual Site Drawings" at the end of the Alternative 3 discussion for site details and design drawings.

### ***Visitor Day-use Parking Capacity and Transit***

Alternative 3 would significantly reduce the maximum daily visitation to Yosemite Valley. The day parking, regional transit, and tour bus capacities would accommodate up to 6,289 day users at one time in Segment 2:

- Reduce available day-use parking spaces (- 740 spaces) for a total of 1,597 parking spaces accommodating a maximum of 4,168 people at one time.
- Accommodate an estimated 1,160 people at one time in circulation on Valley roads.
- Accommodate a maximum of 241 people at one time arriving to the Valley on regional transit.
- Retain tour bus parking at 15 spaces accommodating up to 720 people at one time.

Visitor circulation would be improved to reduce traffic congestion and to provide a better arrival experience for visitors. Major actions would include the following:

- Redesign day parking at Yosemite Village to provide 550 designated spaces.
- Construct a parking lot with 150 designated day parking spaces and a new 3,000 square foot comfort station west of Yosemite Lodge; provide 15 bus loading/unloading spaces.
- Redesign the intersection at Sentinel Bridge; switch Southside Drive to a two-way road.

Conceptual site drawings for the Yosemite Village Day-use Parking Area and the new parking lot west of Yosemite Lodge under Alternative 3 have been completed to allow the analysis of impacts of these potential projects. See "Conceptual Site Drawings" at the end of the Alternative 3 discussion for site details and design drawings.

## ALTERNATIVES

Due to the reductions day use parking supply in this alternative, as compared to current peak demand, an East Yosemite Valley Day Use Parking Permit System would be instituted.

Regional transit service would be reconfigured to expand the number of routes, but to reduce runs on some routes, consistent with anticipated demand, as follows:

- Highway 140 (Merced to Yosemite Valley): Maintain service at 8 runs per day.
- Highway 41 between Fresno and Yosemite Valley: Implement new public transit service at 1 run/day.
- Highway 120 West (Groveland to Yosemite Valley): Reduce service to 1 run per day (summer only).
- Highway 120 East (Mammoth Lakes to Yosemite Valley): Maintain service at 1 run per day (summer only)

Under all the action alternatives, including Alternative 3, shuttle bus service would be improved by increasing the frequency of the year-round East Yosemite Valley service to 5 minute intervals during peak use. The Visitor Center Express service (summer only) would continue to run at 15 minute intervals. The El Capitan Crossover service (summer only) would continue to run at 30-minute intervals.

**TABLE 8-26: TRANSIT OPTIONS- ALTERNATIVE 3**

Regional Transit Options	
HWY 140 Merced/Mariposa to Yosemite Valley	8 runs per day (4 from Merced; 4 from Mariposa) (year round)
HWY 41 Fresno/Oakhurst to Yosemite Valley	1 run per day
HWY 120 West Groveland/Sonora to Yosemite Valley	1 weekday run- Sonora to Valley 2 weekend runs- Groveland to Valley (summer only)
HWY 120 East Inyo/Mono County (Mammoth Lakes) to Yosemite Valley	1 run per day (summer only)
Yosemite Valley Shuttle Options	
East Yosemite Valley	5 minute peak interval between buses Year round except Visitor Center direct
Visitor Center Express Yosemite Valley Day-use Parking Area to Visitor Center	15 min. interval between buses (summer only)
El Capitan Crossover	30 min. interval between buses (summer only)
West Yosemite Valley	No service

### *Administrative Activities*

Administrative activities would be relocated further from the river:

- Relocate the Yosemite Lodge housekeeping and maintenance facilities to a location behind the Yosemite Lodge cafeteria.

### ***Employee Housing and Employee Parking***

Concessioner employee housing would be reduced. Compared to existing conditions, 229 fewer concessioner employees would be housed in Yosemite Valley. The remaining housing for 922 concessioner employees would be provided as follows:

- Provide housing for 436 employees at Curry Village.
  - Retain permanent housing in the Curry Village residential area (223 employees)
  - Retain housing at Curry Village stable (49 beds).
  - Construct 16 buildings housing 164 employees.
- Provide housing for 340 employees at Yosemite Village:
  - Retain permanent housing at Indian Creek, Lost Arrow, and Upper Tecoya (65 employees)
  - Retain Ahwahnee Row, Y Apartments, garage housing, and Hospital Row (43 employees)
  - Retain Tecoya Dorms (232 employees)
- Provide housing for 104 employees at Yosemite Lodge:
  - Construct new housing for 104 employees at Yosemite Lodge (two structures with 26 double-occupancy units each)

Four group administrative campsites (up to 120 people) would be retained at the Yellow Pine Administrative Campground.

### ***Segment 3: Merced Gorge (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

Actions to protect and enhance River Values in Segment 3 are all detailed in the section titled, “Actions Common to Alternatives 2-6” (see page 8-53).

#### **User Capacity, Land Use and Facilities Management**

This alternative would provide for similar kinds and amounts of use that exist today. The majority of actions for Alternative 3 in Segment 3 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

#### ***Visitor Activities & Services***

Only private boats would be allowed in this segment for this alternative. Boaters would be allowed on the river below Pohono Bridge and run the river into El Portal (Segment 4). Boaters would be allowed to put in and take out at any of the roadside pull-outs. This use would be managed by a permit system and restricted to 5 boats per day.

#### ***Transit Options***

Public transit options along this segment would be expanded as described in Segment 2, above.

### ***Segment 4: El Portal (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 4 for Alternative 3 are addressed in “Actions Common to Alternatives 2-6” (see page 8-53).

#### **User Capacity, Land Use and Facilities Management**

Alternative 3 would provide for similar kinds and amounts of use that exist today. User capacity in Segment 4 for Alternative 3 is mostly affected by the increase in employee housing in El Portal. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor boundary.

#### ***Visitor Activities and Services***

Most visitor activities and services in Segment 4 are considered in “Actions Common to Alternatives 2-6” (see page 8-77). Additional actions are listed below:

- Boating: Private boats would be allowed in Segment 4. Expected use would be mostly rafts and kayaks. Boaters would be permitted below Yosemite View Lodge to beyond the Foresta Bridge (at which point boaters would exit the segment.) Boaters would be able to use put-ins and take outs below the hotel, at the store/gas station and the Red Bud launch site. This use would be regulated through a permitting system that allows for up to 5 boats per day.

#### ***Visitor Overnight Capacity***

No NPS overnight accommodations for the public are proposed in Segment 4 under any alternative. An expansive lodging complex is located on private land near the park boundary, but these lodging units are not under NPS jurisdiction.

#### ***Visitor Day Use Capacity***

Day-use parking capacities would not change for Segment 4 in Alternative 3 (214 spaces).

#### ***Administrative Activities***

All administrative activities in Segment 4 are considered in “Actions Common to Alternatives 2-6” (see page 8-53).

#### ***Employee Housing Capacity***

In Alternative 3, high density employee housing would be added to the El Portal Village Center (12 beds) and Rancheria Flat (19 beds). All new units would be outside of the 100-year floodplain. These units would be added to accommodate for the units removed from Segment 2.

#### ***Employee and Administrative Parking Capacity***

Most employee and administrative parking actions are discussed in “Actions Common to Alternatives 2-6” (see page 8-53). This additional housing would also include 27 employee overnight parking spots that would be established as a result of the additional housing units El Portal Village Center and Rancheria Flat.



### ***Transit Options***

Regional transit options would maintain existing service along the Highway 140 corridor. For a complete summary of transit activity that passes through this segment, see the Segment 2 summary above.

## ***Segment 5: South Fork Merced River Above Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions in Alternative 3 that are specific to this segment.

### **User Capacity, Land Use and Facilities Management**

Alternative 3 would provide for similar kinds and amounts of use that exist today in Segment 5. The majority of actions for Alternative 3 in Segment 5 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Use levels would be unrestricted given the expected low use due to the remote nature of the river segment.

### ***Transit Options***

Specific transportation options for reaching Segment 5 trailheads are listed below under Segment 7.

## ***Segments 6 and 7: Wawona and Wawona Impoundment (Recreational Segments)***

### **Actions to Protect and Enhance River Values**

In addition to the actions detailed in the section titled “Actions Common to Alternatives 2-6” (see page 8-53), protection and enhancement of cultural values and water quality would be accomplished through the actions described below.

### ***Cultural Values/Water Quality***

- Wawona stock campground: Relocate stock campground (2 sites) from culturally sensitive area to the Wawona Stables area.
- Wawona Campground: Retains 69 sites. Remove 27 sites that are either within the 100-year floodplain or in culturally sensitive areas.

### **User Capacity, Land Use and Facilities Management**

Alternative 3 would provide for similar kinds and amounts of use that exist today. Notable changes to these segments in Alternative 3 would be the removal of the Wawona Golf Course and changes to the capacity of the Wawona Campground. The majority of actions for Alternative 2 in Segment 7 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

- Allow only private boats in Segment 7. Expected use would be mostly kayaks and other small whitewater boats. Boaters would be permitted below Swinging Bridge to beyond the park line, with the exception of the Wawona Impoundment. Boaters would be able to use put-ins and take outs at Swinging Bridge, the store area, South Fork Picnic Area and below the campground. This use would be regulated through river patrol and monitoring as the use level is expected to be low, and therefore would not be limited.
- Remove the Wawona Golf Course and ecologically restore area while retaining as a spray field for reclaimed water. Repurpose the Golf Shop for another use.
- Remove the Wawona Hotel Tennis Court.
- Eliminate commercial day rides originating from the Wawona stables. Remove the stables and repurpose area as a stock use campground.

### ***Visitor Overnight Capacity***

The Wawona Campground would be reduced from 97 to 70 sites (444 people), including a group camping site (to accommodate up to 30 persons). The two campsites at the Wawona stock camp would be relocated to the Wawona stables and would accommodate 6 people per night each (12 people per night total). Total overnight capacity for the Wawona Campground would be 456 people.

Total overnight capacity for Segment 7 would be 176 lodging units and campsites that accommodate 703 people.

### ***Visitor Day Use Capacity***

Total visitor day use capacity for this area would be increased from 1,295 to 1,321 people at one time. This increase is due to new regional transit options that contribute up to 26 visitors at one time to this segment.

### ***Transit Options***

In-park shuttle options between Wawona and Yosemite Valley and Wawona and Mariposa Grove would continue. New regional transit options would be provided along the Highway 41 corridor with one run between Fresno and Yosemite Valley daily. Alternative 3 would have a maximum capacity of 26 visitors at one time arriving via regional transit.

## ***Segment 8: South Fork Merced River Below Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions in Alternative 3 that are specific to this segment.

### **User Capacity, Land Use and Facilities Management**

Alternative 3 would provide for similar kinds and amounts of use that exist today in Segment 8 and significant changes are not proposed. The majority of actions for Alternative 3 in Segment 8 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Permits would not be required as the expected use level is very low.

### ***Transit Options***

Transit services for access to this segment are described above under Segment 7 (see above).

## **Analysis of Facilities and Services**

Table 8-27 presents the park's assessment of the particular facilities and services that would be needed to support public use and/or to protect river resources based on the types, levels, and locations of use proposed for Alternative 3. As an example, the goals of this alternative include a more dispersed visitor experiences and extensive riverbank Restoration. This alternative would direct comprehensive restoration within 150 feet of the Merced River and prescribe visitor use levels lower than current levels, therefore making it possible to convert the Housekeeping Camp to a day-use area and the Merced Lake High Sierra Camp a temporary pack stock camp. Camping and lodging would be less than today, only more dispersed because Yosemite Lodge would remain, as would most of the campgrounds.

**TABLE 8-27: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 3**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 1: Wild</b>			
Merced Lake High Sierra Camp	Re-purposed as temporary pack camp	<b>Yes:</b> This facility offers rustic accommodations to visitors traveling independently or as a part of the organized High Sierra Loop Trip offered by the concessioner in cooperation with the NPS. The number of camp beds allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No:</b> The High Sierra Camp is outside designated Wilderness; however it is surrounded by designated wilderness. Designated wilderness precludes the construction of new facilities such as this. Alternatives in Chapter 8 consider various means of addressing impacts to ORVs.
Merced Lake Backpackers Camping Area	Converted to dispersed camping	<b>No:</b> Consistent with the land use restoration and visitor experience goals of this alternative, this designated camping is no longer needed.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Little Yosemite Valley Camping Area	Converted to dispersed camping	<b>No:</b> Consistent with the land use restoration and visitor experience goals of this alternative, this designated camping is no longer needed.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Moraine Dome Camping Area	Converted to dispersed camping	<b>No:</b> Consistent with the land use restoration and visitor experience goals of this alternative, this designated camping is no longer needed.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
<b>Segment 2: Curry Village and Campgrounds</b>			
Upper Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Lower Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
North Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Backpackers Campground	Removed (partially re-located)	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience. In addition, this campground is critical for backpackers who need to start or end their wilderness trip in Yosemite Valley.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.

TABLE 8-27: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 3

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Valley Campground Reservation Center	Re-located (due to Southside Drive re-routing)	<b>Yes:</b> The Valley Campground Reservation Center is an essential National Park Service point-of-contact for campers, and those who seek campsites, in Yosemite Valley. The Campground Reservation Center staff sells campsite reservations for all campsites in the park available for reservations. The Reservation Center is operated on a year-round basis.	<b>Yes.</b> The Campground Reservation could be moved from its existing location. However, it is important to the successful delivery of services provided from the reservation center that any alternative location be near the Valley campgrounds.
Housekeeping Camp Lodging Units	Removed (re-purposed as day-use river access area)	<b>No:</b> Under this alternative, the level of visitor accommodations is reduced and, therefore, consistent with the land-use restoration goals.	<b>No.</b> While some buildings within the Housekeeping Camp complex could be relocated to sites further from the Merced River, it is not feasible to consider a wholesale relocation of the lodging units.
Housekeeping Camp Shower Houses and Restrooms	Retained 1 restroom. Removed shower houses, laundry, and grocery.	<b>Yes:</b> Public restrooms are needed in many areas throughout the river corridor to comply with public health regulations and meet the basic personal needs of visitors and employees. The public showers at Housekeeping Camp are provided for guest use as well as other patrons, including campers and hikers.	<b>No.</b> The Housekeeping Camp restrooms and shower houses are components of the overnight guest accommodations at this location. They are required to be located within or very near the overnight sleeping units.
Housekeeping Camp Laundry	Removed	<b>No:</b> The public laundromat at Housekeeping Camp is not needed with the elimination of the Housekeeping Camp.	<b>No.</b> This service is provided for Housekeeping Camp guests and is directly linked to the camp; relocating the service and providing a general laundry facility for park visitors is not necessary.
Housekeeping Camp Grocery	Removed	<b>No:</b> This need for the grocery store is tied to the level of lodging units at Housekeeping Camp. With a reduction of lodging, the grocery store is not needed.	<b>Yes.</b> The merchandise offered at this location is offered elsewhere in Yosemite Valley.
Curry Village Lodging and Shower Houses	Reduced	<b>Yes:</b> Curry Village offers rustic and economy overnight guest accommodations consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs. This facility is needed to support public use by visitors who do not camp.	<b>No.</b> This lodging facility is part of a National Register Historic District. It is not feasible to relocate the complex, including shower and toilet facilities needed by guests in without-bath accommodations, to locations outside the river corridor.
Curry Village Overnight Parking	Retained	<b>Yes:</b> Parking at Curry Village is needed to support the day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Orchard Parking Area	Re-developed	<b>Yes:</b> Parking at Curry Village Orchard is needed to support day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Village Raft Rental	Service eliminated / facility removed	<b>No:</b> This is not a vital visitor service under this alternative.	<b>N/A:</b> This service will be eliminated.
Concessioner Stables in Yosemite Valley	Reduced (as staging area for MLHSC pack stock)	<b>Yes:</b> The stable operation at in Yosemite Valley supports the High Sierra Camp operations. The location of the stables is within reach of each of the High Sierra camps by one day's ride, and trailering stock from El Portal or Wawona would be a substantial operational burden due to time and distance required to reach trailheads.	<b>No.</b> There are no other suitable locations for a stable operation, neither in proximity to other visitor services nor proximity to the Valley trail system used to access the Merced Lake High Sierra Camp.

**TABLE 8-27: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 3**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Concessioner Stables Employee Housing Area	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Roadway section removed	<b>No:</b> Under this alternative this segment of Northside Drive through Ahwahnee Meadow is removed and therefore this bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would access the east Yosemite Valley by way of Southside Drive, which would be converted to two-way traffic. This change in traffic circulation for Yosemite Valley would be feasible due to substantial reduction in visitor use levels.	<b>N/A</b> This section of roadway is removed and traffic is re-routed to Yosemite Valley destinations using nearby roadway sections.
Southside Drive (through Stoneman Meadow)	Roadway section removed	<b>No:</b> Under this alternative this segment of Southside Drive through Stoneman Meadow is and traffic is routed through Curry Village giving pedestrians, bicycles, NPS law enforcement and fire protection access the east Yosemite Valley. This change in traffic circulation for Yosemite Valley would be feasible due to substantial reduction in visitor use levels.	<b>N/A</b> This section of roadway is removed and traffic is re-routed to Yosemite Valley destinations using nearby roadway sections.
Sugar Pine Bridge	Removed	<b>No.</b> Under this alternative this pedestrian, bicycle, and emergency vehicle bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would be re-routed north of river so that visitors can access points of interest in Yosemite Valley. Removal of this bridge will restore free-flowing conditions and riparian habitat.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Ahwahnee Bridge	Removed	<b>No.</b> Under this alternative this pedestrian, bicycle, and emergency vehicle bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would be re-routed north of river so that visitors can access points of interest in Yosemite Valley. Removal of this bridge will restore free-flowing conditions and riparian habitat.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Stoneman Bridge	Removed	<b>No.</b> Under this alternative the segment of Northside Drive through Ahwahnee Meadow is removed and therefore this bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would access the east Yosemite Valley by way of Southside Drive, which would be converted to two-	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.



TABLE 8-27: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 3

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
		way traffic. Park visitors would be able to access points of interest in Yosemite Valley via Clark's and Happy Isles Bridges. Removal of this bridge will restore free-flowing conditions and riparian habitat.	
Upper Pines RV Loop and Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
<b>Segment 2: Yosemite Village and Housekeeping Camp</b>			
Ahwahnee Row Employee Housing	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lower Tecoya Employee Housing Area	Retained	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services consistent with the land use restoration and visitor experience goals of this alternative.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lost Arrow Employee Housing Area	Removed and re-developed (as administrative parking)	<b>No:</b> Under this alternative removal of this facility is consistent with land-use restoration goals and these housing facilities are not needed given the substantial reduction of commercial services and lodging.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Re-route Northside Drive south of Yosemite Village Day-use Parking Area and outside of the 10-year floodplain	Re-routed roadway	<b>Yes:</b> This roadway serves as the exit road for all Yosemite Valley traffic. The congestion created in this vicinity is a result of pedestrian-vehicle conflicts that would be completely mitigated if no pedestrians were required to cross the road from the parking lot to access numerous visitor services including the primary visitor center, museum, and the Valley shuttle.	<b>No.</b> While some changes to the exact location of the road system could be feasibly rerouted for approximately ¼ mile, it could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor traffic in Yosemite Valley is identified.
Yosemite Village Day-use Parking Area	Re-developed and expanded	<b>Yes:</b> This facility will serve as the primary day-use parking lot for Yosemite Valley because it is proximate to numerous visitor services including the primary visitor center, museum, and the Valley shuttle. A day-use visitor parking area of this size is needed to support the level of public use that has been found to protect and enhance river values.	<b>No.</b> While some changes to the exact location of the parking lot and road system leading to the parking lot could be feasibly relocated, the parking lot could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor parking in Yosemite Valley is identified.

**TABLE 8-27: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 3**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp (cont.)</b>			
Residence 1 (Superintendent's House)	Relocated	<b>Yes.</b> This historic structure is a component of the Historic Resources ORV and would be rehabilitated and used to support the visitor experience.	<b>Yes.</b> Under this alternative, the facility would no longer be a component of the Historic Resources ORV and could be relocated outside the river corridor to the lower NPS housing area.
<b>Segment 2: Yosemite Lodge and Camp 4 Area</b>			
<b>Yosemite Lodge Overnight Units</b>	<b>Reduced</b>	<b>Yes:</b> Yosemite Lodge offers mid-scale and economy overnight guest accommodations for visitors who do not or are unable to camp. The number of units allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> While some buildings within the Yosemite Lodge complex could be relocated to sites further north of the Merced River, however, it is not feasible to consider a wholesale relocation of the complex to an alternative location.
Yosemite Lodge Overnight Parking	Retained	<b>Yes:</b> Parking is needed to support visitors who stay at Yosemite Lodge. Parking is also needed for park partner organizations and NPS staff who use the Lodge's meeting and interpretive spaces (i.e., the Cliff Room, Gardner Terrace, and the outdoor amphitheater).	<b>No.</b> As long as visitor services are provided at Yosemite Lodge, it will be necessary to provide parking near the Lodge complex.
Yosemite Lodge Garden Terrace and Cliff Room	Retained	<b>Yes:</b> These areas are used for interpretive programs and for training courses, meetings, and special events. These facilities are vital to National Park Service and park partner operations.	<b>No.</b> The Garden Terrace and Cliff Rooms are within the existing buildings at the Yosemite Lodge complex. The activities taking place at these locations could be considered for relocation to alternative facilities, however, it is not feasible to consider removing the buildings in their entirety.
Yosemite Lodge Gift and Grocery (Convenience Shop)	Reduced	<b>Yes:</b> The facility provides visitors a limited range of merchandise including packaged and fresh groceries, sundries, and outdoor products frequently needed by campers and hikers.	<b>No.</b> The building currently housing the Yosemite Lodge Gift and Grocery Store is part of the Yosemite Lodge food service and retail structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Mountain Room Bar & Food Service	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room Bar is part of the Yosemite Lodge food service structure and would be infeasible to relocate.
Yosemite Lodge Mountain Room Restaurant	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room restaurant is part of the Yosemite Lodge food service structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.

TABLE 8-27: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 3

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Lodge and Camp 4 Area (cont.)</b>			
Yosemite Lodge Highland Court Employee Housing (Existing and New)	Replaced with permanent housing proximate to current location	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
Yosemite Lodge Employee Housing (Thousands Cabins) (Existing)	Removed and relocated (incorporated into permanent housing above)	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
Yosemite Lodge Day-use Parking Area (New)	Constructed	<b>Yes:</b> This facility will serve as a critical day-use parking lot for Yosemite Valley because substantial numbers of roadside parking spaces adjacent to meadows will be removed in the vicinity of the Yosemite Village Day-use Parking Area. This new parking area will serve as trailhead parking for the upper and lower Yosemite Falls trail, and overflow evening parking for Camp 4 Campground. It will also be used for the Wauhoga Cultural Center.	<b>No.</b> No alternative areas of sufficient size or location proximate to upper and lower Yosemite Falls trailhead, Wauhoga, Camp 4 and the Yosemite Lodge could accommodate this parking area.
<b>Segment 2: West Yosemite Valley</b>			
Yellow Pine Administrative	Retained	<b>Yes:</b> This administrative camping area is used by volunteers and researchers whose work is critical to meeting our NPS mission.	<b>No.</b> No alternative areas of sufficient size or location could accommodate this campground.
<b>Segment 4: El Portal</b>			
Rancheria Employee Housing Area (New)	Constructed	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs, and to accommodate employees who provide resource protection services consistent with the mission of the National Park Service and current agency management policies.	<b>No.</b> In-fill employee housing should occur within existing employee housing areas
El Portal Remote Parking at Abbieville / Trailer Village (New)	Constructed	<b>Yes:</b> This parking area will provide a vital queuing and staging area during peak use periods when congestion in the East Yosemite Valley reaches conditions whereby the National park Service would not permit more vehicles to add to the crowding. Day-use visitors would be provided shuttle service to Yosemite Valley from this location.	<b>No.</b> There are no other suitable locations proximate with direct access to Highway 140 before entering Yosemite National Park boundary.

**TABLE 8-27: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 3**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 5 (Wild), Segments 6 &amp; 7 (Recreational), Segment 8 (Wild)</b>			
Wawona Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> This campground could not be relocated as no suitable alternative site exists in the Wawona proper adjacent to the river, which is an integral part of the camping experience.
Wawona Hotel Tennis Court	Removed	<b>No:</b> Opportunities for this type of visitor recreation is not considered a vital visitor service given the land use and visitor experience goals under this alternative.	<b>N/A:</b> This service will be eliminated.
Wawona Hotel Golf Course & Shop	Removed	<b>No:</b> Opportunities for this type of visitor recreation is not considered a vital visitor service given the land use and visitor experience goals under this alternative.	<b>N/A:</b> This service will be eliminated.
Wawona Stables	Retained	<b>Yes:</b> The need for the Wawona Stables infrastructure is driven, in part, by commercial day rides, which are eliminated.	<b>No.</b> The stable operates from a historic structure that could not be feasibly relocated.
Wawona Commercial Horseback Day Rides	Service eliminated	<b>No:</b> Opportunities for this type of visitor recreation is not considered a vital visitor service given the land use and visitor experience goals under this alternative.	<b>N/A:</b> This service will be eliminated.

## **Conceptual Site Drawings**

### ***Boys Town***

In Alternative 3, Southside Drive would be re-routed around Stoneman Meadow, all of the Boys Town cabins and facilities removed, and the area restored to natural conditions. The Curry Orchard Day-use Parking Area would be partially restored to facilitate Stoneman Meadow restoration while retaining approximately 300 parking spaces.

### ***Yosemite Village Day-use Parking Area***

In Alternative 3, the existing 6-acre Yosemite Village Day-use Parking Area and all associated roadway improvements would be moved outside of the 10-year floodplain of the river to facilitate riparian restoration goals and to prevent further resource damage. Restoration actions would remove non-native fill material, re-contour the topography, and plant native vegetation. The redesigned parking area would be formalized to provide a total of 550 parking spaces. Northside Drive would be realigned to the south edge of the parking area where it would connect with Sentinel Drive and continue west to Yosemite Falls and park exits. Consolidating the parking to the north of Northside Drive, with new and improved walkways to Yosemite Village, would eliminate vehicle and pedestrian conflicts. A new bus passenger unloading area would be established east of the Village market and five new spaces provided for bus parking. The Concessioner General Office, Concessioner Garage, Arts and Activities Center (former bank building) would be removed, while the Village Sport Shop would be repurposed as a visitor contact station.

The area of disturbance for improvements at Camp 6 in Alternative 2 would cover approximately 22 acres and include 14 acres of clearing and grubbing, 1.2 acres for existing building removal, 1,000 square feet for the new restroom, 5.4 acres of pavement removal, 1.7 acres of new roadway, 2.4 acres for new parking, 14,900 square feet of utility service trenching, and 38,000 square feet for new pedestrian pathways. Construction staging would cover an area of approximately 2 acres.

### ***Yosemite Lodge Parking Area***

In Alternative 3, the area west of Yosemite Lodge, currently used as parking for tour buses, transit buses and for overnight guests, would be re-developed to provide 150 day-use parking spaces, parking for 15 buses, a new 3,000 square foot comfort station and a re-located shuttle stop. The existing tour bus drop off area would be relocated to the Highland Court area. The wellness center, linen storage and laundry buildings would be removed. Ground disturbance within a 11.2 acre footprint west of the Lodge would include 8.6 acres of clearing and grubbing, 55,850 square feet of existing building and pavement removal, 3,000 square feet for the new comfort station and shuttle stop, 13,300 square feet of utility service trenching, 2.5 acres for parking, and 2,500 square feet for pedestrian pathways. Construction staging would take place over a 2 acre area within the existing footprint. Existing vegetation would be retained to separate and screen parking bays while bioswales would serve to filter and treat storm water run-off.

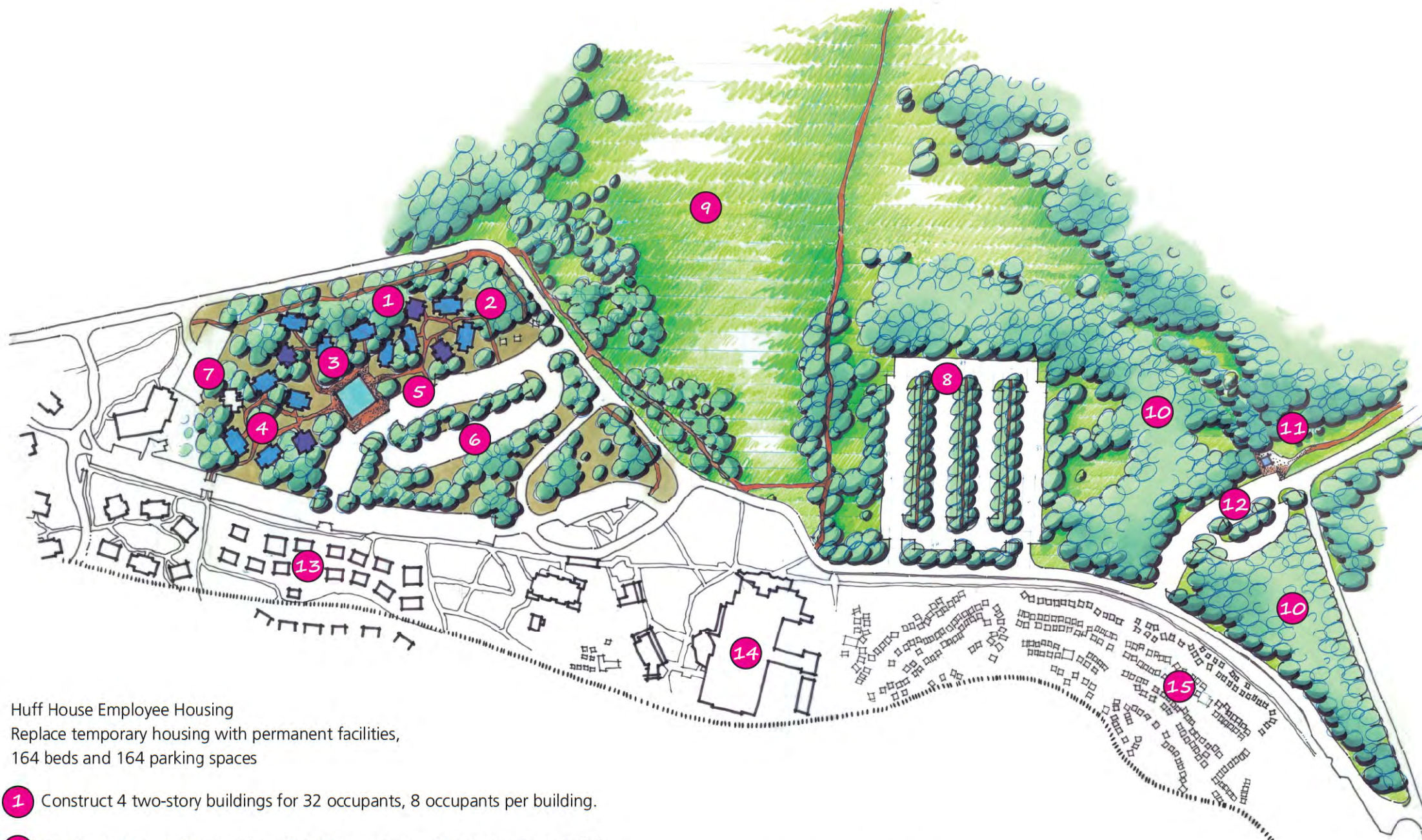
### ***Yosemite Lodge Housing***

In Alternative 3, the temporary modular housing at Highland Court, and the Thousand Cabins would be removed and replaced with two new buildings to house 104 concessioner employees. In addition, a new parking area would provide 78 employee parking spaces, parking for 3 shuttle buses, and 53 day-use parking

## ALTERNATIVES

spaces for the public. Ground disturbance for the two housing sites would cover a total of 7.4 acres and would include 45,500 square feet of preparation for the new buildings, 5,500 square feet of utility service trenching, and 1.8 acres for parking.





Huff House Employee Housing  
Replace temporary housing with permanent facilities,  
164 beds and 164 parking spaces

- 1 Construct 4 two-story buildings for 32 occupants, 8 occupants per building.
- 2 Construct 11 two-story buildings for 132 occupants, 12 occupants per building.
- 3 Provide common recreational area, approximately 3,600 square feet.
- 4 Build plaza areas and walkways with site furnishings, accent paving, and enhanced landscaping.
- 5 Construct a shuttle bus stop.
- 6 Remove ice rink and bicycle rentals. Construct an employee parking facility with 164 spaces.
- 7 Retain historic residence for housing purposes.

Curry Orchard Parking Area

- 8 Improve parking area with 300 spaces and landscape buffers with trees and bioswales that will treat storm water run-off. Provide pedestrian walkways.

Stoneman Meadow Restoration

- 9 Remove Stoneman Road and adjacent recreation trail. Extend boardwalk from existing terminus (at Stoneman Road) to Curry Village Pavilion area, improve hydrology, remove invasive species, promote weed control and plant native species.

Boys Town

- 10 Remove existing guest accommodations and ecologically restore lands.
- 11 Relocate Campground Reservation Center and provide 8 parking spaces.
- 12 Construct a roadway to connect Curry Village and East Valley campgrounds. Provide additional roadside parking.

Existing Curry Village Visitor Services

- 13 Retain existing historic cabins and Stoneman Cottage (65 lodging units).
- 14 Retain existing Curry Pavilion.
- 15 Retain 290 tents.

\*These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



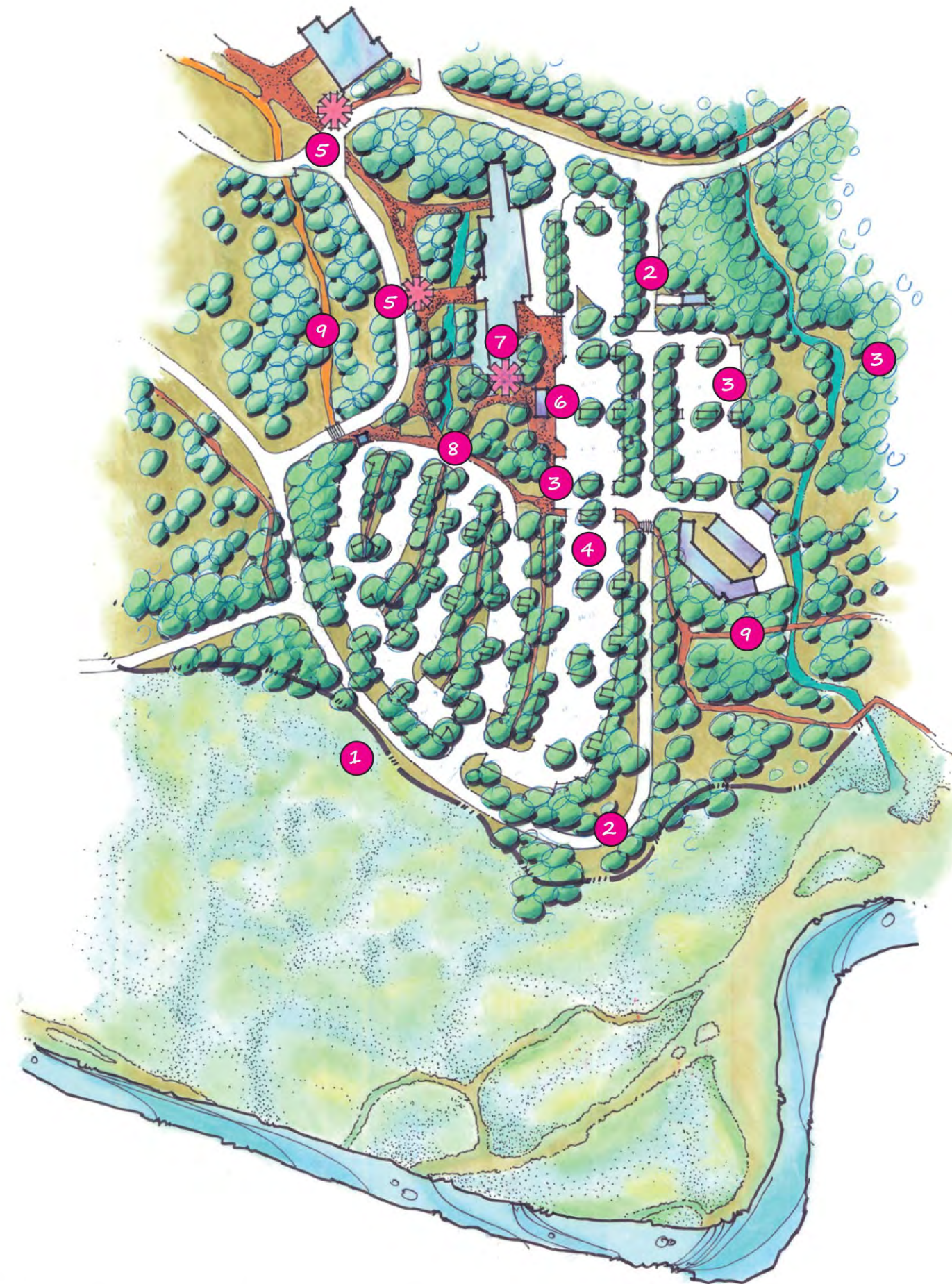
### Alternative 3 Conceptual Site Drawing for Curry Village

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- 1 Use the 10-year floodplain to establish limits of development. Restore wetlands and meadow.
- 2 Reroute Northside Drive to conform to the floodplain extent and south edge of day-use parking area. Northside Drive is eliminated east of this location.
- 3 Eliminate Concessioner General Office and Garage between the Village Store and Ahwahnee Meadow, providing more space for visitor parking. Employee dormitories and housing would be removed in Alternative 2 (as drawn), but retained in Alternative 3.
- 4 Provide 550 day-use parking spaces in between Northside Drive and Yosemite Village. Integrate landscaped areas to retain large numbers of trees, and include bioswales that will treat storm water run-off. Improve access through a system of pedestrian pathways leading to the Yosemite Village mall.
- 5 Retain existing shuttle stops on Visitor Center Loop Drive.
- 6 Establish bus passenger unloading area east of the Yosemite Village mall.
- 7 Replace Village Sport Shop with visitor contact station.
- 8 Eliminate art activity center and improve pedestrian access.
- 9 Improve pedestrian connections and bike paths east and west of the day-use parking area.



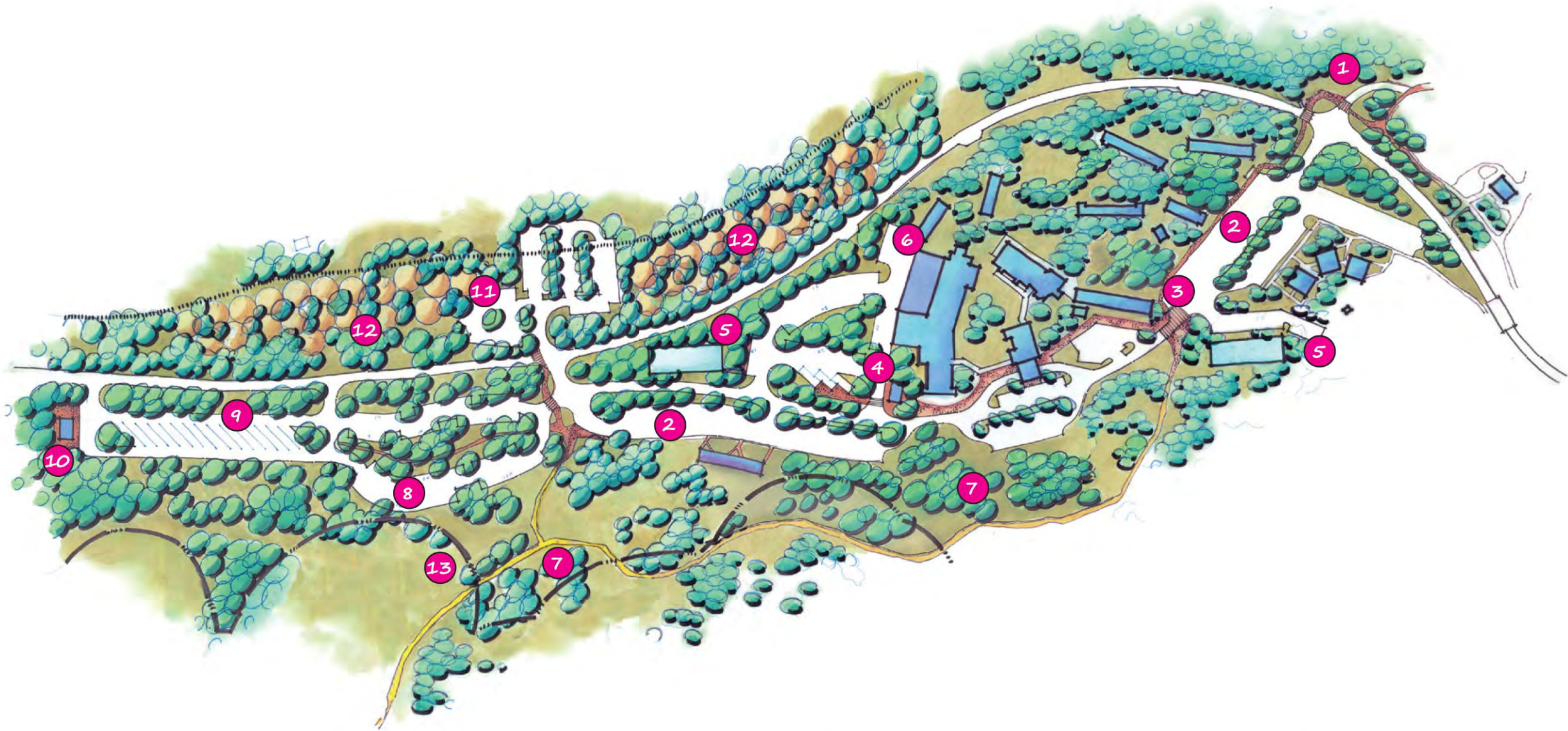
**Alternatives 2 and 3**  
**Conceptual Site Drawing for**  
**Yosemite Village Day-use Parking Area**  
 Yosemite National Park  
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\*These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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1 Move pedestrian crossing to Yosemite Falls west of the existing intersection.

2 Maintain parking for overnight guests.

3 Enhance pedestrian circulation system.

4 Construct tour bus loading and unloading area, with shelter.

5 Construct employee housing in 2 two-story buildings with 52 occupants per building and 39 employee parking spaces per building.

6 Relocate linen storage and laundry buildings to an addition to the food service building. Reconfigure truck loading and unloading area.

7 Remove existing NPS volunteer office and 4 guest lodging buildings from the 100-year floodplain, restore vegetation and hydrological processes.

8 Construct 150 day-use parking spaces at Yosemite Lodge Day-use Parking Area. Maintain existing vegetation as buffers to separate and screen parking bays, provide pedestrian pathways and bioswales that will retain storm water run-off.

9 Construct 15 tour bus parking spaces.

10 Construct a shuttle bus stop with shelter and comfort station.

11 Construct 41 additional parking spaces at Camp 4.

12 Retain 35 existing walk-in campsites at Camp 4. Construct 35 additional walk-in sites opposite existing parking facility. Occupancy is limited to 6 campers per site. Standard walk-in campsite is 3,850 square feet (70-foot diameter), including 1,200 square feet of clearance with a 15-foot perimeter buffer.

13 Protect and enhance a 150-foot riparian buffer.



NORTH

### Alternative 3 Conceptual Site Drawing for Yosemite Lodge and Camp 4 Yosemite National Park

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\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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## **ALTERNATIVE 4: RESOURCE-BASED VISITOR EXPERIENCES AND TARGETED RIVERBANK RESTORATION**

### **Overview**

The guiding principles of Alternative 4 include restoration of portions of the floodplain and the riparian area within 150 feet of the river. This alternative focuses on providing only those commercial services and facilities that facilitate resource-based visitor experiences. It accommodates lower maximum visitor use levels than today, with large increases in overnight camping capacity and moderate decrease in the overnight lodging capacity.

Management actions in Alternative 4 would:

- Restore 223 acres of meadow and riparian habitat.
- Significantly increase the campsite inventory in all river segments (+37%) and in Yosemite Valley (+50%).
- Reduce the lodging inventory in all river segments (-20%) and in Yosemite Valley (-20%).
- Reduce day-use parking for Yosemite Valley (-12%).
- Reduce commercial services.
- Make targeted changes to the traffic circulation pattern in Yosemite Valley to accommodate ecological restoration goals and reduce traffic congestion.
- Accommodate approximately 17,000 visitors per day in East Yosemite Valley.
- Continue to manage overnight use capacity through wilderness permits, and reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through permits and a reservation system required during peak summer season.

### ***Actions to Protect and Enhance River Values***

#### **Summary of Actions to Protect and Enhance River Values**

Alternative 4 would protect and enhance river values through targeted ecological restoration focused on enhancing the habitat quality of the riparian zone and the hydrologic function of the river. Alternative 4 would balance the enhancement of these river values with maintaining much of the existing traffic circulation pattern and infrastructure. This alternative would ecologically restore the area currently occupied by the Merced Lake High Sierra Camp, the portion of Housekeeping Camp that is within the ordinary high water mark of the river, and all campsites and associated infrastructure within 150 feet of the river. The free-flowing condition of the river would be enhanced by removing two bridges. Hydrologic connectivity of meadows to the riparian floodplain would be enhanced through the removal the segment of road that bisects Stoneman Meadow.

Cultural and scenic values would be protected and enhanced as described under “Actions Common to Alternatives 2-6” (beginning on page 8-53). Recreational values would be protected and enhanced through the removal of the Merced Lake High Sierra Camp, and by improving visitor circulation and reducing crowding in Yosemite Valley. Table 8-28 provides a summary of the proposed actions that would occur under Alternative 4 to protect and enhance river values.

**TABLE 8-28: ADDITIONAL ACTIONS TO PROTECT AND ENHANCE RIVER VALUES, ALTERNATIVE 4**

<b>Ecological Restoration Actions (Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values)</b>	
<b>Corridorwide</b>	
<b>Ecological Restoration Acreage</b>	164 acres (common to all) plus an additional 59 acres (refer to Appendix E for specific locations)
<b>Riprap to be Removed</b>	5,700 linear feet (common to all) plus an additional 435 feet (refer to Appendix E for specific locations)
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Riparian Buffer / Floodplain</b>	Remove the Merced Lake High Sierra Camp and restore the floodplain to natural conditions.
<b>Segment 2: Yosemite Valley</b>	
<b>Free Flow /Geologic/ Hydrologic Values</b>	<ul style="list-style-type: none"> <li>Remove Ahwahnee and Sugar Pine bridges to enhance the free-flowing condition of the river.</li> </ul>
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore 19.7 acres of habitat in former Upper and Lower River Campgrounds; construct campsites 150 feet away from the river</li> <li>Move Yosemite Village Day-use Parking Area parking north at least 150 feet away from the river.</li> <li>Remove portions of North Pines, Lower Pines, and Wawona Campgrounds that are within 150 feet of the river.</li> <li>Remove portions of Housekeeping camp and restore the floodplain to natural conditions.</li> </ul>
<b>Meadow Restoration</b>	<ul style="list-style-type: none"> <li>Remove 1,335 feet of Southside Drive through Stoneman Meadow to enhance connectivity of the meadow and floodplain</li> </ul>
<b>Recreational Values</b>	
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Wilderness Recreation</b>	<ul style="list-style-type: none"> <li>Enhance wilderness character by removing the Merced Lake High Sierra Camp and converting this area to designated Wilderness</li> <li>Reduce zone capacities and size of LYV camping area.</li> <li>Expand footprint of Merced Lake camping area (to reduce person density in this area)</li> </ul>

### *User Capacity, Land Use, and Facilities Management*

Alternative 4 would focus on providing resource-based visitor experiences, increasing camping opportunities, and reducing commercial services. The number of visitors to Yosemite Valley would remain unchanged; however, overnight use would increase while day use decreased. Table 8-29 provides a summary of user capacities by use type and location.

**TABLE 8-29: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 4**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 4	
	Unit Type	Units	People	Units	People
<b>Wilderness Above Nevada Fall</b>					
Visitor Overnight Use	Zone Capacities & Beds	380	380	270	270
Visitor Day Use	Day Hikers	350	350	350	350
Employee Housing	Employee Beds	15	15	10	10
Administrative Day Use	Day Patrols	5	5	5	5
<b>Yosemite Valley</b>					
Visitor Overnight Use	Rooms & Campsites	1,500	6,564	1,524	7,224
Visitor Day Use	Parking Spaces & Buses	-	8,272	-	7,554
Employee Housing	Employee Beds	1,315	1,315	1,087	1,087
Administrative Day Use	Parking Spaces	166	332	166	332

**TABLE 8-29: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 4**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 4	
	Unit Type	Units	People	Units	People
<b>Merced Gorge</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	180	869	180	869
Employee Housing	Employee Beds	9	9	9	9
Administrative Day Use	Parking Spaces	2	4	2	4
<b>El Portal</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	214	740	414	740
Employee Housing	Employee Beds	192	192	300	300
Administrative Day Use	Parking Spaces	610	1,220	610	1,220
<b>South Fork Above Wawona</b>					
Visitor Overnight Use	Zone Capacities	20	20	20	20
Visitor Day Use	Day Hikers	6	6	6	6
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1
<b>Wawona</b>					
Visitor Overnight Use	Rooms & Campsites	203	865	176	703
Visitor Day Use	Parking Spaces & Buses	-	1,295	-	1,399
Employee Housing	Employee Beds	121	121	121	121
Administrative Day Use	Parking Spaces	30	60	30	60
<b>South Fork Below Wawona</b>					
Visitor Overnight Use	Permits	3	3	3	3
Visitor Day Use	Day Hikers	3	3	3	3
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1

## Visitor Overnight Capacity

### Camping

The campsite inventory in Yosemite Valley would be increased by approximately 50%; this increase would be partially offset by camping reductions in Wawona, but corridorwide there would still be a 37% net increase in campsites. All campsites within 150 feet of the river would be removed and replaced by new campgrounds adjacent to the Upper Pines Campground, east of Camp 4, west of Backpackers Camp, and west of Yosemite Lodge. Under Alternative 4, the total number of campsites in Yosemite Valley would increase to 701, and the total number of campsites available in the corridor would be 773. Table 8-30 provides a summary of the proposed changes to camping.

**TABLE 8-30: CAMPING FACILITIES- ALTERNATIVE 4**

Existing Locations	Alt 1 (No Action)	Alt 4	Details
Backpackers	25 sites	0 sites	25 walk-in sites removed, of which 21 are within 150 feet of the river; 16 of these walk-in sites would be relocated west of Backpackers
Camp 4	35 sites	35 sites	No change to this National Historic Register Site
Lower Pines	76 sites	61 sites	15 sites within 150 feet of the river removed
North Pines	86 sites	52 sites	34 sites within 150 feet of the river removed
Upper Pines	240 sites	238 sites	2 sites removed for cultural resource concerns
Yellow Pine Administrative	4 sites	4 sites	No changes to these group administrative sites

**TABLE 8-30: CAMPING FACILITIES- ALTERNATIVE 4**

Existing Locations	Alt 1 (No Action)	Alt 4	Details
Wawona Campground	99 sites	72 sites	27 sites removed within 150 feet of river or in culturally sensitive areas
<b>Total Existing Locations</b>	<b>565 sites</b>	<b>462 sites</b>	
New Locations	Sites	Alt 4	Details
West of Backpackers	0 sites	16 sites	16 walk-in sites relocated from Backpackers Camp to less sensitive area outside 100-year floodplain
East of Camp 4	0 sites	35 sites	35 walk-in sites constructed in area east of Camp 4
Upper Pines	0 sites	87 sites	36-site RV loop and a walk-in campground with 49 sites and 2 group sites constructed
Former Upper River	0 sites	32 sites	30 walk-in and 2 group sites constructed 150 feet from river in the former footprint of the Upper River Campground
Former Lower River	0 sites	40 sites	40 walk-in sites constructed 150 feet from the river in the former footprint of the Upper River Campground
Yosemite Lodge	0 sites	20 sites	20 RV sites constructed west of Yosemite Lodge and adjacent to parking area
Boys Town	0 sites	40 sites	40 drive-in sites constructed
Concessioner Stables	0 sites	41 sites	Stables redeveloped as a campground with 41 drive-in sites
<b>Total New Camping</b>	<b>0 sites</b>	<b>311 sites</b>	
<b>Total Camping in Corridor</b>	<b>565 sites</b>	<b>773 sites</b>	

### Lodging

In-park lodging availability would be reduced by approximately 20% as compared to Alternative 1. Management actions related to lodging would focus on removing lodging units from within the ordinary high-water mark at Housekeeping Camp and in Wilderness. All permanent infrastructure at the Merced Lake High Sierra Camp would be removed, allowing the area to be converted to designated Wilderness. Curry Village lodging would be retained except for the units removed from the Boys Town area, which would be redeveloped as a new campground. No new hard-sided lodging would be constructed in Alternative 4 in any part of the river corridor. As a result of these actions, the in-park lodging inventory would be reduced from 1,160 units to 927 units. Table 8-31 provides a summary of the proposed changes to lodging and the reasons for those proposed changes.

**TABLE 8-31: LODGING FACILITIES- ALTERNATIVE 4**

Wilderness	Alt 1 (No Action)	Alt 4	Details
Merced Lake High Sierra Camp	22 units (60 beds)	0 units	Lodging facility removed and area converted to designated Wilderness.
Yosemite Valley	Alt 1	Alt 4	Details
Ahwahnee Hotel	123 rooms	123 rooms	No change at this National Historic Landmark
Housekeeping Camp	266 tent cabins	100 tent cabins	Remove 166 units out of the observed high-water mark
Curry Village	400 units	355 units (290 tents and 65 hard-sided units)	<ul style="list-style-type: none"> <li>Retain 290 tents</li> <li>Retain 18 units at Stoneman House</li> <li>Retain 47 cabin-with-bath units</li> <li>At Boys Town, Southside Drive would be re-routed and re-developed as a 40-site campground</li> </ul>
Yosemite Lodge	245 rooms	245 rooms	No changes at this lodging facility

**TABLE 8-31: LODGING FACILITIES- ALTERNATIVE 4**

Wawona	Alt 1	Alt 4	Details
<b>Wawona Hotel</b>	104 rooms	104 rooms	No change at this National Historic Landmark
Total Lodging in Corridor	1,160 units	927 units	
* <b>El Portal:</b> Private accommodations exist but are not on NPS land; therefore, they are not listed here.			

## Visitor Day Use Capacity and Access Improvements

Day-use parking capacity in Yosemite Valley would be reduced by 12% compared to current levels. Day-use capacity would be actively managed and potentially restricted during peak use season (May through September). A day use permit system for East Yosemite Valley would be implemented in this alternative during the peak summer season. Table 8-32 provides a summary of the total number of parking spaces for each segment of the corridor where parking would occur.

**TABLE 8-32: NUMBER OF DAY-USE PARKING SPACES IN SEGMENTS– ALTERNATIVE 4**

Location	Alt 1 (No Action)	Alt 4
Segment 2: Yosemite Valley	2,337 spaces	2,045 spaces
Segment 3: The Gorge	180 spaces	180 spaces
Segment 4: El Portal	214 spaces	414 spaces
Segment 7: Wawona	290 spaces	290 spaces
Total Parking	3,021 spaces	2,929 spaces
*The 200 new spaces in El Portal are located in the Abbieville Remote Parking area. While these spaces are located in El Portal, most of the use associated with these spaces will occur in Yosemite Valley.		

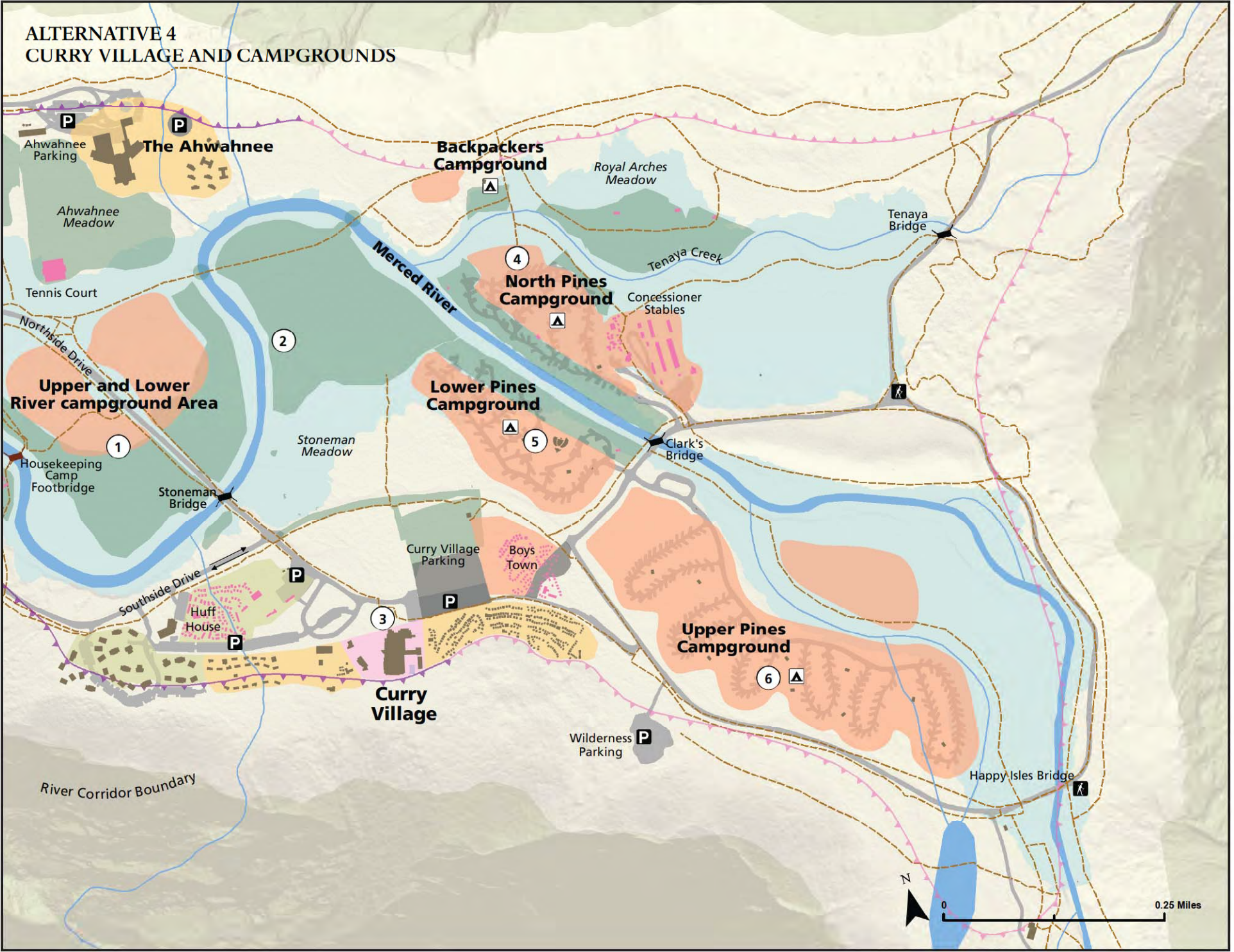
The most significant changes to parking and circulation would take place in the vicinity of Yosemite Village Day-use Parking Area, Yosemite Lodge and El Portal. Day use visitors would park at a redesigned parking area at Yosemite Village Day-use Parking Area, with a total of 850 parking spaces. At Yosemite Lodge, proposed changes include a new day-use parking area west of the lodge, with a total of 150 parking spaces. Overflow parking during times of peak visitation would be provided in El Portal at the Abbieville site (200 parking spaces). The NPS shuttle system would be expanded to serve locations in West Yosemite Valley, including Bridalveil Fall. Total parking for East Yosemite Valley (including day, overnight and administrative uses) would be approximately 4,800 spaces.

Transit services would remain unchanged on the Highway 140 and Highway 120 East corridors. Service on the Highway 120 West corridor would increase to two round-trip runs per day. Four round-trip runs per day would be added to the Highway 41 corridor. All within-park shuttle services would maintain the same base levels of service. Additionally, the East Yosemite Valley would reduce shuttle intervals to 5 minutes, and the West Yosemite Valley shuttle would be expanded to serve Bridalveil Fall during the summer season. The park shuttles from Wawona to Yosemite Valley would also expand to two runs per day.

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# ALTERNATIVE 4: RESOURCED-BASED VISITOR EXPERIENCES AND TARGETED RIVERBANK RESTORATION



## Legend

Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment

## EAST YOSEMITE VALLEY: CURRY VILLAGE AND CAMPGROUNDS

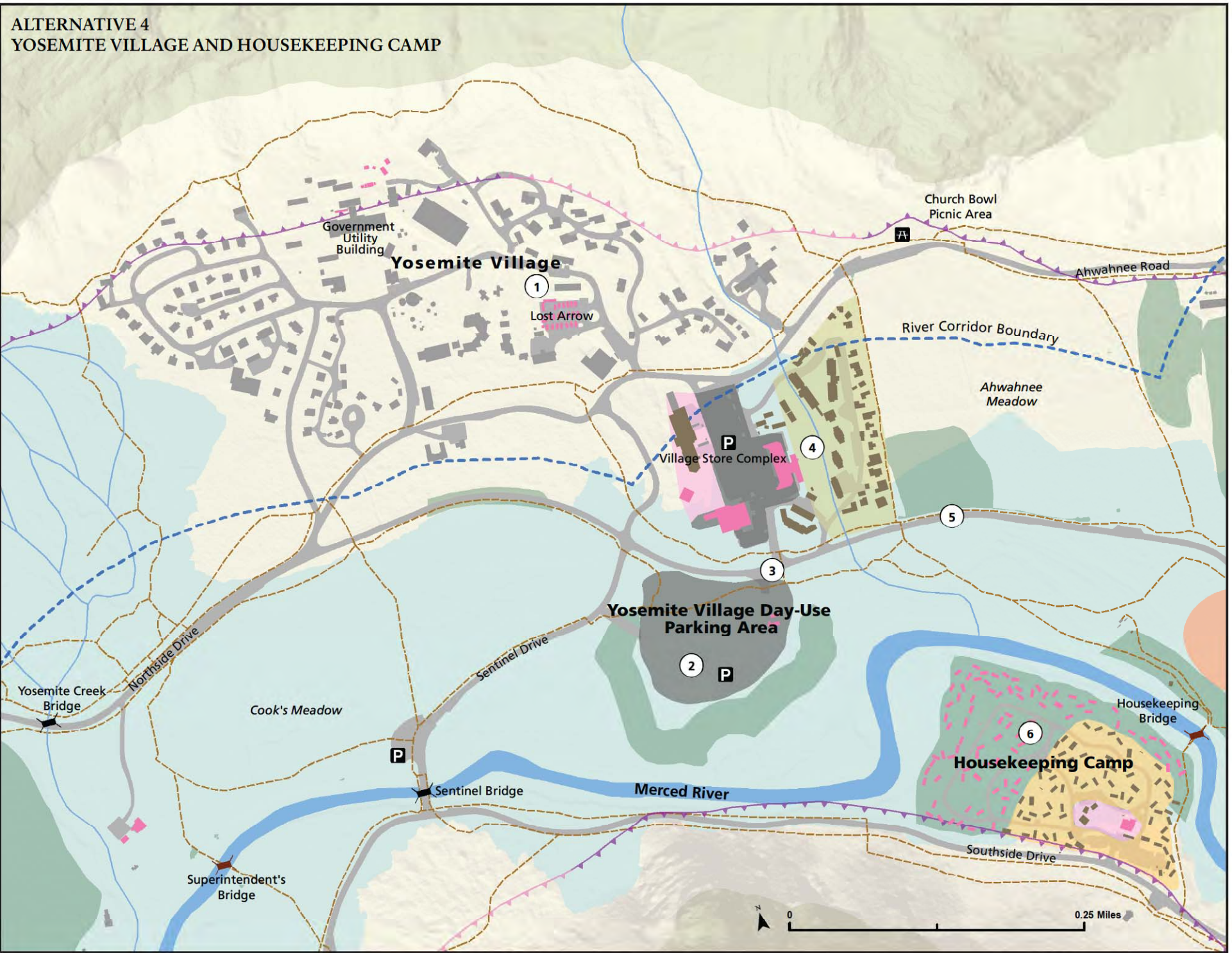
- Former Upper and Lower River Campground**
  - New Lower River Campground: Construct a new campground 150 feet away from the river with 40 walk-in sites. Provide picnic tables and parking for day use and directed river access to the Housekeeping Camp eastern beach. Restore hydrologic processes in the southeast portion of the area.
  - New Upper River Campground: Construct a new campground 150 feet away from the river with 30 walk-in sites and 2 group sites. Restore hydrologic processes in the south east portion of the area.
  - Restoration: Restore 19.7 acres of floodplain. Protect the riverbank from trampling by fencing sensitive areas.
- River Reach Between Bridges**
  - Ahwahnee and Sugar Pine Bridges: Remove the Ahwahnee and Sugar Pine bridges to enhance free-flowing conditions. Restore to natural conditions. Re-route the multiple-use trail to the north bank of the river.
  - Stoneman Bridge: Mitigate effects of bridge to free-flowing condition through engineered solutions: place large wood to lessen scouring, and use brushlayering, a constructed log jam, and culverts along Northside Drive.
- Curry Village Area**
  - Lodging: Total would be 355 guest units, including: 290 tents in Curry Village retained; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained. At Boys Town, Southside Drive would be re-routed and a 40-site campground would be constructed.
  - Ecological Restoration: Remove Southside Drive through Stoneman Meadow to enhance the hydrologic connectivity of the meadow. Re-align road through the Boys Town area instead of the meadow. Extend meadow boardwalk up to 275 feet to Curry Village.
  - Curry Orchard Parking Area: Provide 300 parking spaces. Ecologically restore part of the existing parking area to accommodate Stoneman Meadow restoration goals. Re-design parking lot using best management practices to increase drainage to Stoneman Meadow and protect water quality. Remove apple trees to mitigate human-bear interactions and plant native vegetation.
- North Pines Campground Area**
  - North Pines Campground: Retain 52 campsites. Remove 34 sites from within 150 feet of river. Designate a river access point at North Pines campground.
  - Backpackers Campground: Remove all 25 walk-in sites, of which 21 are within the 150-foot riparian buffer. Partially replace with 16 walk-in sites west of Backpackers Campground.
  - Concessioner Stables in Yosemite Valley: Remove and re-develop the stables area as a new 41-site drive-in campground. Remove associated employee housing (25 beds).
- Lower Pines Campground Area**
  - Campground Sites: Retain 61 campsites and remove 15 sites from within 150 feet of river.
- Upper Pines Campground Area**
  - Campground Sites: Retain 238 campsites. Remove two sites for sensitive resource concerns.
  - New RV Loop: Construct a new campground loop with 36 RV sites.
  - New Walk-in Sites: Construct a new walk-in campground with 49 sites and 2 group camping sites.



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# ALTERNATIVE 4: RESOURCED-BASED VISITOR EXPERIENCES AND TARGETED RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE VILLAGE AND HOUSEKEEPING CAMP

1. Lost Arrow: Replace temporary employee housing with permanent housing units for 50 beds.
2. Yosemite Village Day-use Parking Area: Move the Yosemite Village Day-use Parking Area northward 150 feet away from the river to facilitate riparian restoration goals. Formalize this parking area, using best management practices to protect water quality, with a total of 750 parking places by re-developing part of the current administrative footprint as parking.
3. Traffic Congestion at Yosemite Village Day-use Parking Area: Re-align the intersection at Northside Drive and Village Drive to meet standards for a proper four-way intersection and improve performance. Add a three-way intersection at Sentinel Drive and the entrance to the day-use parking area to improve traffic flow and alleviate congestion at nearby intersections. Provide on-grade pedestrian crossings with proper sight lines to alleviate vehicle-pedestrian conflicts.
4. Concessioner Employee Housing: Create a 50-foot setback from Indian Creek. Ecologically restore the riparian habitat, and protect using restoration fencing. Retain Ahwahnee Row and Tecoya employee housing.
5. Ahwahnee Meadow Restoration: Retain Northside Drive and bike path, but increase culverts to improve hydrologic connectivity. Replace 350 feet of trail with a boardwalk to protect wetlands.
6. Housekeeping Camp Lodging: Retain 100 lodging units, and remove 166 lodging units (83 duplex lodging units, four restrooms, store and office) out of the ordinary high-water mark. Retain Housekeeping Camp shower houses and laundry; reduce restrooms; and remove grocery store. Restore 12.2 acres of floodplain and riparian ecosystem.

### Legend

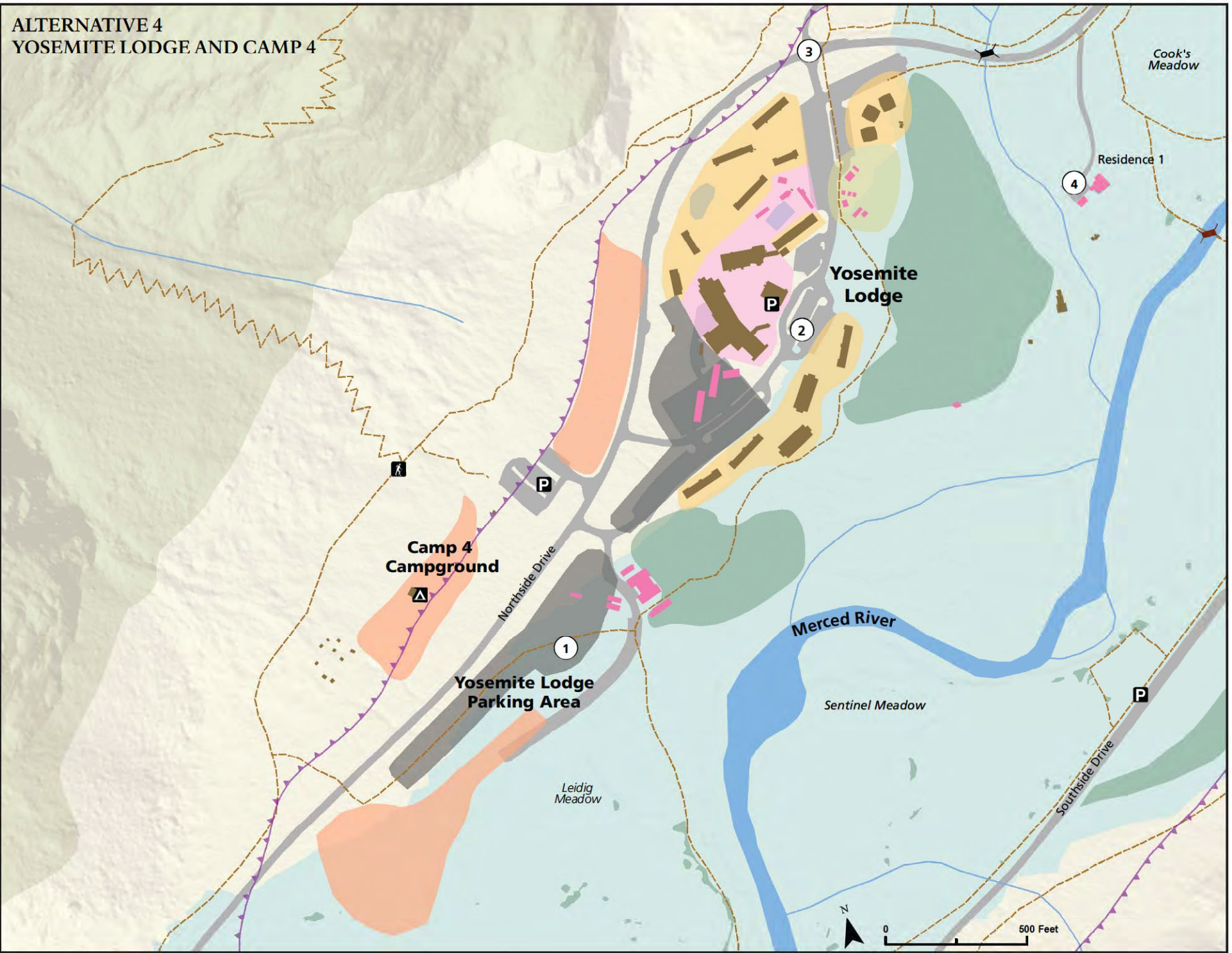
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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# ALTERNATIVE 4: RESOURCED-BASED VISITOR EXPERIENCES AND TARGETED RIVERBANK RESTORATION



## Legend

Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment

## EAST YOSEMITE VALLEY: YOSEMITE LODGE AND CAMP 4

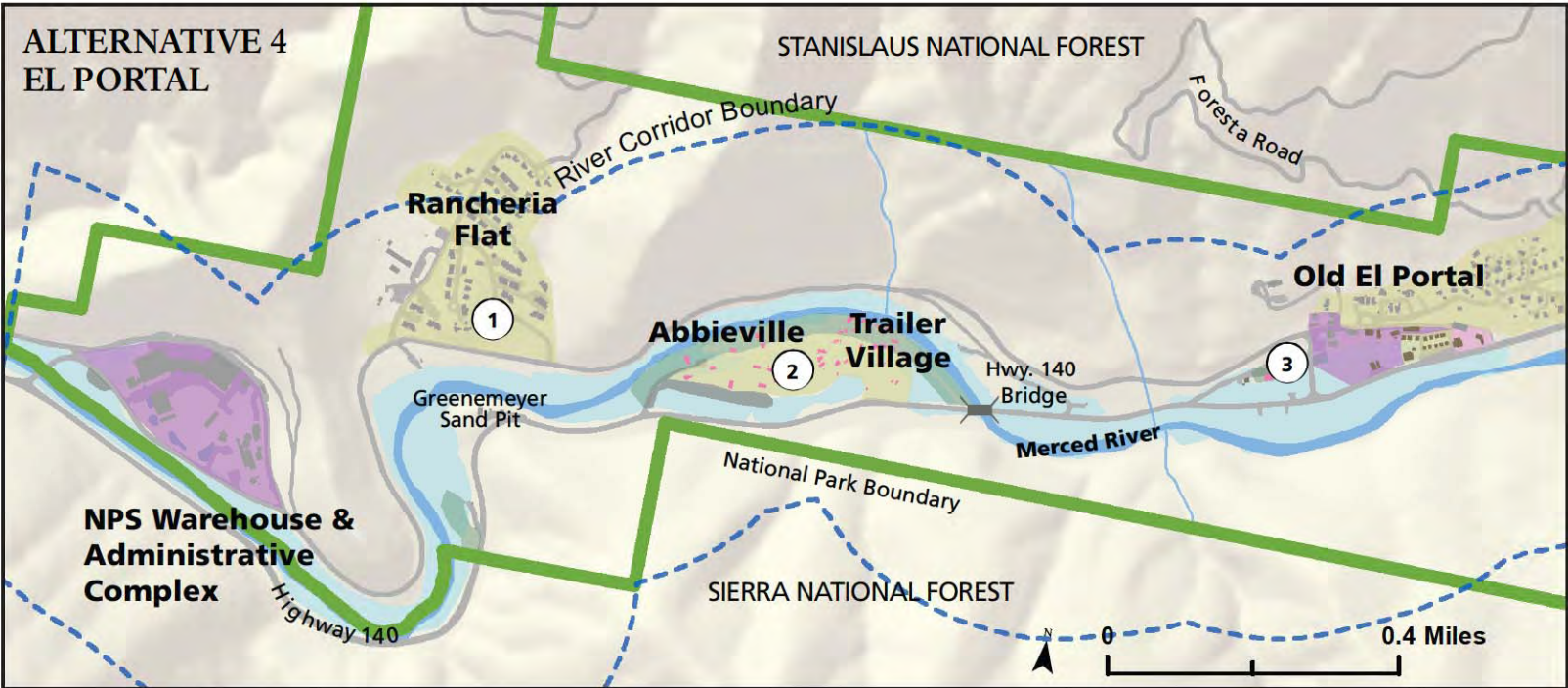
- 1. West of Yosemite Lodge**
  - Parking:** Construct additional 150 day-use parking spaces southwest of Yosemite Lodge. Formalize parking for 15 tour buses in this location. Parking redevelopment will incorporate best management practices to protect water quality.
  - RV Camping:** Construct 20 RVs sites adjacent to the new Yosemite Lodge parking area.
- 2. Yosemite Lodge Area**
  - Ecological restoration:** Restore riparian and floodplain ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate a service road to the well house and parking. Remove non-native fill, decompact soils and plant riparian plant species (10.9 acres), per the Secretary of Interior's Standards for the Treatment of Historic Properties and the Historic Structures Report
  - Lodging:** Retain the current 245 units at Yosemite Lodge.
  - Services and Facilities:** Retain Yosemite Lodge cafeteria and Mountain Room bar and dining service. Re-purpose convenience shop and nature shop. Relocate Yosemite Lodge maintenance. Remove Yosemite Lodge post office, swimming pool, bike rentals, snack stand, employee housing (called Thousands Cabins), Highland Court employee temporary housing, and the NPS Volunteer Office.
  - Tour Buses:** Remove temporary housing complex at Highland Court and establish a tour bus drop-off area with three bus loading spaces.
  - Yosemite Lodge Day-Use Parking:** Create 25 new parking spaces by re-designing parking near Northside Drive.
  - Yosemite Lodge Concessioner Housing:** Construct two new concessioner housing areas for 104 employees and construct 78 employee parking spaces. (Common to all alternatives is to remove housing at Highland Court and at the Thousands Cabins)
- 3. Yosemite Falls Intersection**
  - Traffic Congestion:** Construct a pedestrian underpass to address pedestrian/vehicle conflicts and associated traffic congestion at the intersection of Northside Drive and Yosemite Lodge Drive.
- 4. Residence 1**
  - Residence 1:** Relocate the historic structure, also known as the Superintendent's House, to the NPS housing area and rehabilitate the building per the Secretary of Interior's Standards for the Treatment of Historic Properties and the Historic Structures Report. Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.



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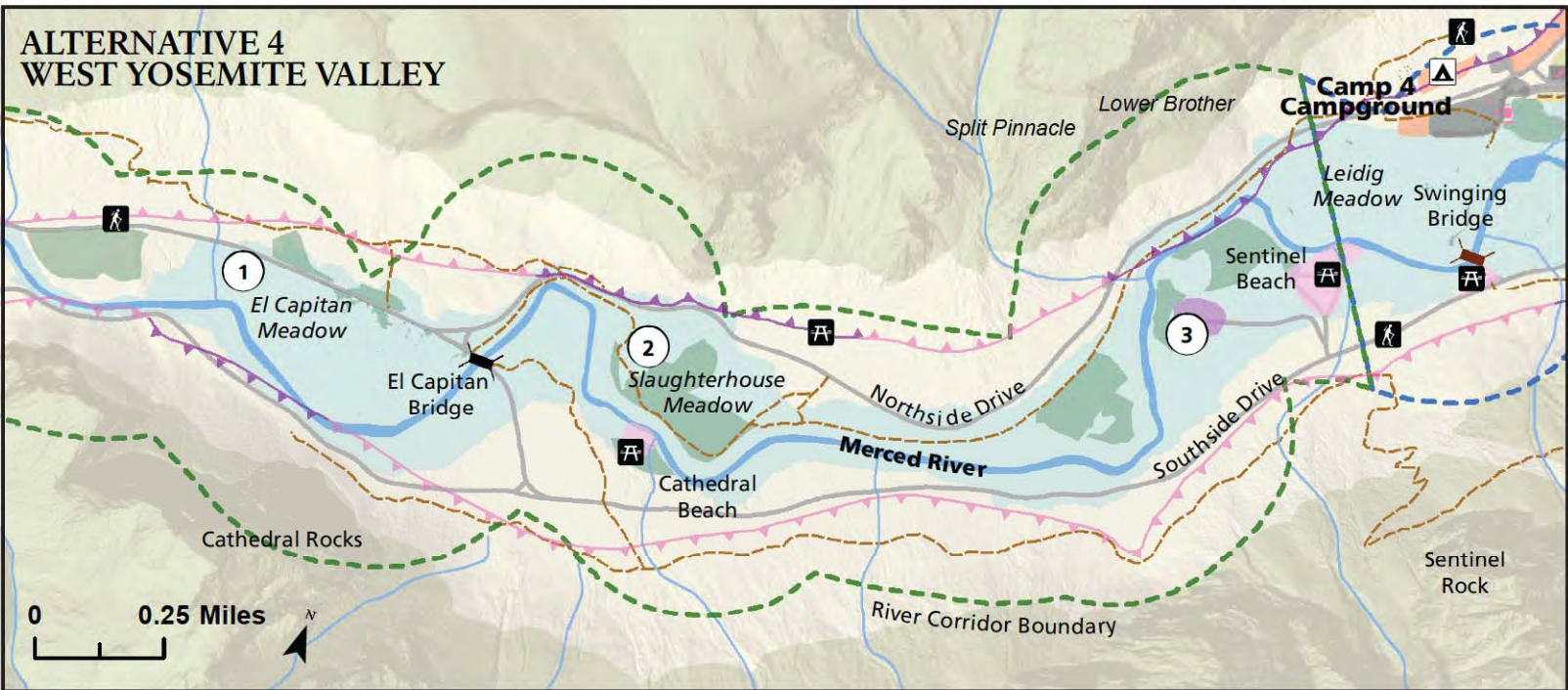


# ALTERNATIVE 4: RESOURCED-BASED VISITOR EXPERIENCES AND TARGETED RIVERBANK RESTORATION



## EL PORTAL

1. Rancheria Flat
  - Employee Housing: To replace temporary housing units that will be removed from Yosemite Valley, construct eight dormitories, with 12 employees each, for a total of 96 employee beds, away from sensitive resources.
2. Abbieville and Trailer Village Area
  - El Portal Remote Visitor Parking: Construct a new visitor parking area for 200 spaces serviced by regional transit. Parking redevelopment will incorporate best management practices to protect water quality.
  - Abbieville and Trailer Village Housing: Remove or relocate 36 existing private residences. Continue to provide for housing land use for 40 employees and volunteers at this location. As homes within the 150-foot riparian buffer become vacant, ecologically restore these areas.
3. El Portal Village Center
  - Valley Oak Restoration: Restore the rare floodplain community of valley oaks in Old El Portal through implementation of best management practices. Create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.
  - Odger's Fuel Storage Facility: Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompact soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.



## WEST YOSEMITE VALLEY

1. El Capitan Meadow Area
  - Restoration of Informal Trails: Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing along northern perimeter of meadow and designate appropriate access points using boardwalks and viewing platforms.
2. Valley Loop Trail
  - Re-Route: Move portions of the Valley Loop Trail out of sensitive areas; this includes the 780 feet of the trail through Bridalveil Meadow. Construct boardwalks through wet meadow habitat in Slaughterhouse Meadow.
3. Yellow Pine Campground
  - Administrative Use Campground: Retain Yellow Pine's four group sites (serving up to 120 people) for administrative use.

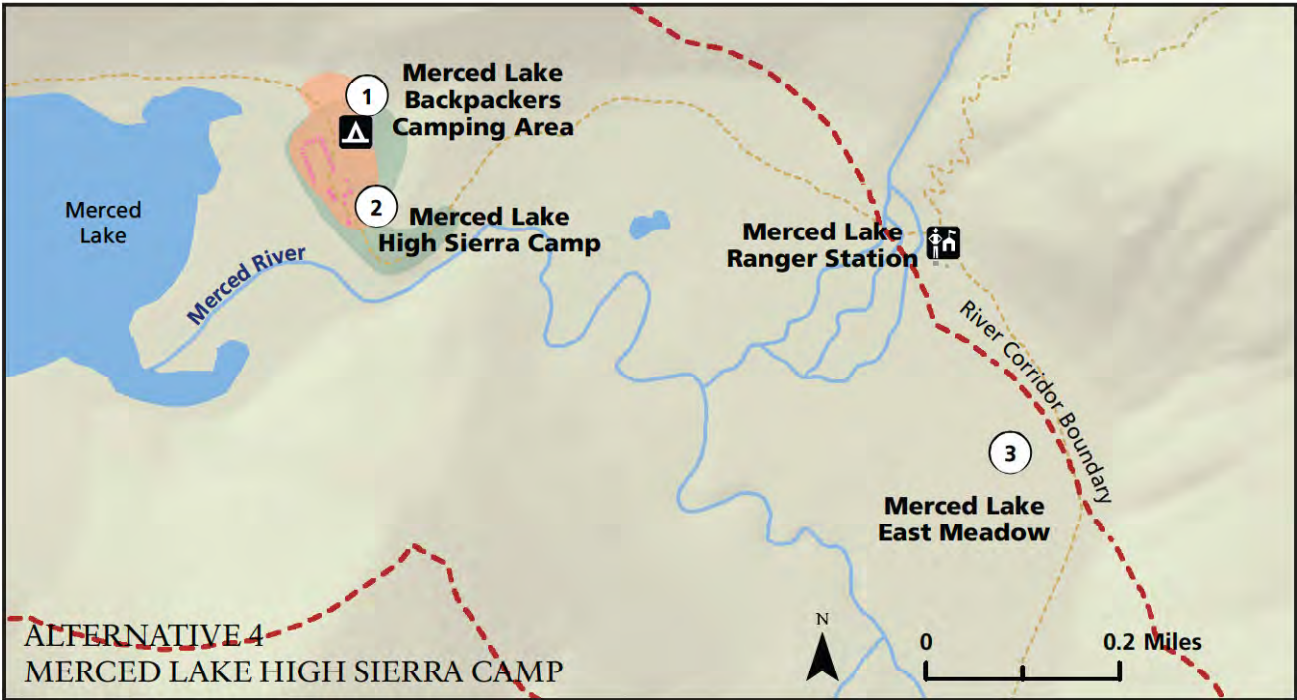
## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		



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# ALTERNATIVE 4: RESOURCED-BASED VISITOR EXPERIENCES AND TARGETED RIVERBANK RESTORATION

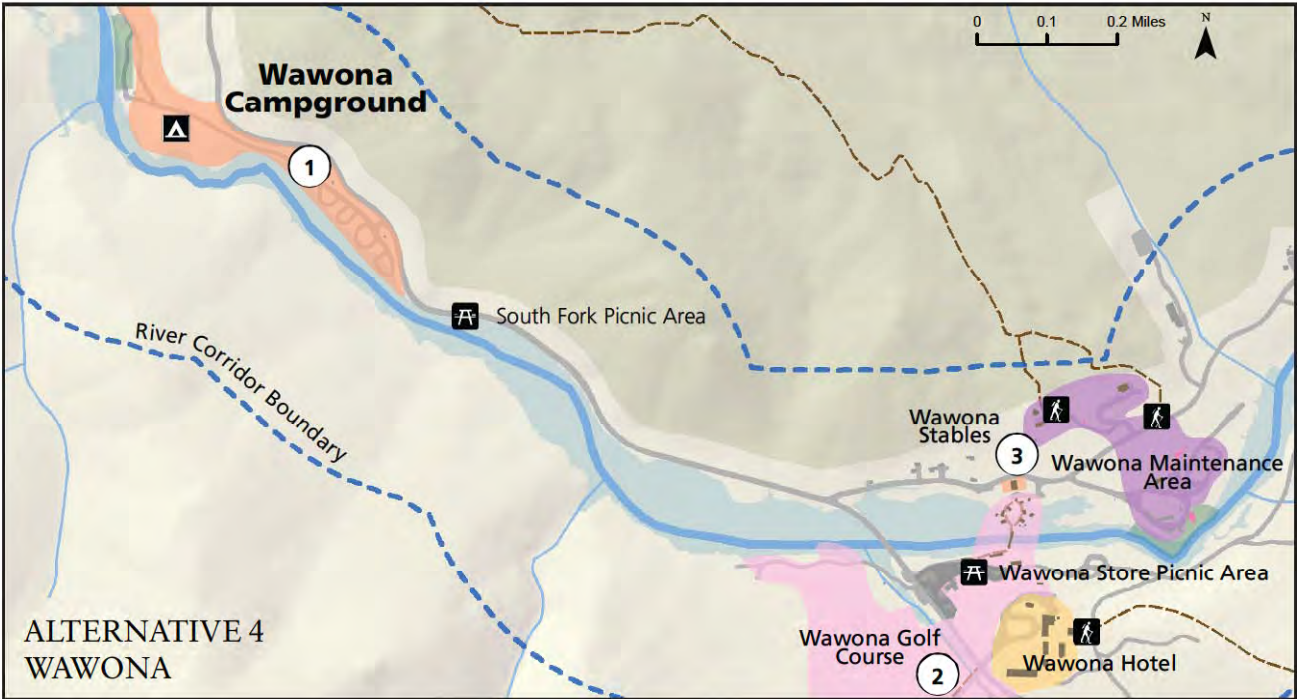


## MERCED LAKE HIGH SIERRA CAMP

1. Merced Lake Backpackers Camping Area: Expand this designated camping area into the re-purposed Merced Lake High Sierra Camp area. Remove waste water system. Replace flush toilets with composting toilets.
2. Merced Lake High Sierra Camp: Remove lodging facility and all associated infrastructure, including buildings, water system, and septic system. Restore the area to natural conditions, converting the area to designated Wilderness.
3. Merced Lake East Meadow: Remove the meadow from grazing permanently. Require all administrative pack stock passing through area to carry pellet feed.

## OTHER SEGMENT 1 CAMPING AREAS

- Little Yosemite Valley: Decrease the designated camping area in this camping area. Retain infrastructure, such as composting toilets.
- Moraine Dome: Continue designated camping in this camping area.



## WAWONA

1. Wawona Campground: Retain 69 sites, and one group site. Remove 27 sites that are either within 150 feet of the river or in culturally sensitive areas.
2. Wawona Golf Course and Golf Shop: Retain nine-hole golf course and retail and food service at golf shop.
3. Wawona Stables: Eliminate stable operation and commercial day rides. Relocate two stock-use campground sites from sensitive resource area to existing stables area.

## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		

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## Detailed Description of Alternative by Segment

### *Segment 1: Wilderness above Nevada Fall (Wild Segment)*

#### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 4 would include the following actions to protect and enhance river values:

##### ***Biological Values***

- Prohibit administrative pack stock grazing at Merced Lake East Meadow. Require administrative stock to pack in pellet feed.

##### ***Recreational Values***

- Enhance Wilderness character through the removal of the Merced Lake High Sierra Camp and conversion of this area to designated Wilderness.
- Retain designated camping areas at Little Yosemite Valley, Moraine Dome, and Merced Lake.
- Reduce crowding at Little Yosemite Valley by reducing the Wilderness zone capacity and trailhead quotas for trailheads that lead to Little Yosemite Valley; reduce the size of the Little Yosemite Valley designated camping area.
- Expand the Merced Lake backpackers camping area into the former footprint, allowing more space for the campers in this area; retain the current the zone capacity for this area.

#### **User Capacity, Land Use and Facilities Management**

Alternative 4 would reduce the amount of infrastructure in the river corridor for Segment 1. In addition to the “Actions Common to Alternatives 2-6” (page 8-77), Alternative 4 would include the following actions to manage user capacity, land use, and facilities:

##### ***Visitor Activities and Services***

Designated camping areas retained in this alternative would include Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers camp.

Private boating would be allowed in this segment under this alternative. Generally, this kind of use would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Put-ins and take-outs would be dispersed and the use level would be regulated with a permit system that is supplement to the existing backcountry permit needed for travel in this area. Permits would allow for 5 boats per day.

The Merced Lake High Sierra Camp and all associated infrastructure would be removed.

Up to two overnight commercial groups would be allowed per wilderness zone in Segment 1.

##### ***Visitor Overnight Capacity***

Overnight capacities for both Little Yosemite Valley and Merced Lake High Sierra Camp would be reduced (Table 8-33). Services would be managed as follows under Alternative 4:

## ALTERNATIVES

- Remove the Merced Lake High Sierra Camp and all associated infrastructure. Convert the area to designated Wilderness.
- Expand the Merced Lake Backpackers designated camping area into the area of the former High Sierra Camp; replace flush toilet with composting toilet and remove associated water system.
- Decrease the designated camping area at Little Yosemite Valley Backpackers Camp and retain the composting toilet. Manage to a capacity of 100 people per day in the Little Yosemite Valley Zone using a zone quota or zone pass through system.
- Retain designated camping at Moraine Dome.

**TABLE 8-33: WILDERNESS ZONE CAPACITIES – ALTERNATIVE 4**

Wilderness Zones	Alt 4 Zonewide Capacity	Alt 4 Zone Capacity Specific to the River Corridor
Little Yosemite Valley Zone	<b>100</b> people (-50 people)	<b>100</b> people (-50 people)
Merced Lake Zone	<b>50</b>	<b>50</b>
Washburn Lake Zone	<b>150</b>	<b>100</b>
Mount Lyell Zone	<b>50</b>	<b>10</b>
Clark Range Zone	<b>50</b>	<b>10</b>
* Number of people reduced from Alternative 1 (No Action) to Alternative 4		

### *Visitor Day-use Parking Capacity*

Day use access to this segment is addressed under “Actions Common to Alternatives 2-6 (beginning on page 8-53).”

### *Administrative Activities*

- Continue current administrative activities, which consist primarily of regular ranger patrols and backcountry utility work as well as occasional trail/restoration crews. These activities are seasonal and minimal in comparison to visitor use and would not affect overall user capacity.

## *Segment 2: Yosemite Valley (Recreational and Scenic Segments)*

### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 4 would include the following action to protect and enhance river values:

#### *Free Flow*

- Retain Stoneman Bridge; mitigate the hydrological effects of the bridge by placing large wood on the riverbanks to address scouring, adding brush layering, and increasing channel complexity between Clarks Bridge and Sentinel Bridge (as described in Chapter 5 and Appendix E).
- Remove Sugar Pine and Ahwahnee Bridges and associated berm/elevated trail connecting them; restore b banks to natural conditions; reroute multiuse trail north along the river.

#### *Water Quality*

- Remove the Concessioner Stable and the pack trail from the stable to Happy Isles; restore to natural conditions.



### **Biological Values**

Alternative 4 would remove all campsites within 150 feet of the high-water mark:

- Remove all existing campsites and associated infrastructure within 150 feet of the ordinary high-water mark and restore natural floodplain and riparian habitat (12 acres).
  - **Backpackers Camp:** Remove all 25 sites, 21 of which are within 150 feet of the ordinary high-water mark. (Replace 16 sites to the west of the current campground.)
  - **North Pines Campground:** Remove 34 sites from within 150 feet of the ordinary high-water mark; restore native riparian vegetation.
  - **Lower Pines Campground:** Remove 15 sites from within 150 feet of the ordinary high-water mark; restore native riparian vegetation.
  - **Upper Pine Campground:** Retain 238 campsites, 22 of which are in the 100-year floodplain.
- **Former Lower and Upper River Campgrounds:** Remove abandoned facilities within 150 feet of the ordinary high-water mark and restore 19.7 acres of natural floodplain topography and riparian/wetland habitat; re-establish overflow channels where possible. Fence and close the riparian zone at former Upper River Campground to protect the riverbank from trampling; direct visitors to access the river for boating and swimming by way of a path to the Housekeeping Camp eastern beach.
- **Yosemite Lodge:** Retain all lodging at Yosemite Lodge, including four structures within the 100-year floodplain.
- **Former Pine and Oak Units:** Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were removed after the 1997 flood) and wellness center while maintaining access to the well house.
- **Yosemite Village:** Move the Yosemite Village Day-use Parking Area northward so that it is 150 feet back from the ordinary high-water mark of the Merced River and outside a designated 50-foot setback from Indian Creek; remove fill material and restore the riparian habitat adjacent to the river.
- **Housekeeping Camp:** Remove lodging and other facilities at Housekeeping Camp out of the observed ordinary high-water mark (remove 166 units); restore native riparian habitat (12.2 acres). Direct visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off the current eastern river access point located on a steep eroded bank, and actively restore the riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.

Alternative 4 would enhance meadow connectivity by removing some roads and trails through meadows, and by mitigating the effects of others:

- **Bridalveil Meadow:** Reroute the 780-foot segment of the Valley Loop Trail that currently crosses Bridalveil Meadow closer to the base of the fill slope of the Valley Loop Road.
- **Slaughterhouse Meadow:** Reroute the portion of the Valley Loop Trail to an upland area out of wetlands at Slaughterhouse Meadow.
- **El Capitan Meadow:** Fence the northern perimeter of meadow to protect the restoration area, and designate appropriate access points using boardwalks and viewing platforms.
- **Ahwahnee Meadow:** Retain Northside Drive and bike path in current configuration; add culverts to improve hydrologic connectivity through Ahwahnee Meadow. Install a boardwalk to traverse wet areas through Ahwahnee Meadow (350 feet in length).

- **Stoneman Meadow:** Remove the segment of Southside Drive that bisects Stoneman Meadow (1,335 feet); realign Southside Drive through Boys Town. Extend the boardwalk through wet areas to Curry Village (up to 275 feet).

### *Scenic Values*

- Eliminate visual intrusion of Southside Drive through Stoneman Meadow

### *Cultural Values*

- Remove three structures from the collective sites representing the prominent historic patterns of development in Yosemite Valley: Sugar Pine Bridge, Ahwahnee Bridge, and Residence 1.
- Relocate Residence 1 to the NPS housing area and at a minimum stabilize the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995).

### *Recreational Values*

- Restrict boating to 100 people per day for private vessels and 75 boats at one time for commercial vessels. This reduction in boats would enhance dispersed recreation along the river corridor.
- Reduce the available day-use parking and implement an East Yosemite Valley Day-use Parking Permit System to reduce crowding at key attraction sites, along roadways, and in parking lots and other facilities.

## **User Capacity, Land Use and Facilities Management**

### *Visitor Activities and Services*

Alternative 4 would protect river-related recreational ORVs through infrastructure improvements where necessary, while reducing recreational activities that are not related to recreational ORVs. It would include the following changes to visitor activities and services in addition to those common to Alternatives 2-6 (see page 8-77):

- Allow both private and commercial boating in this river segment. Put-ins and take-outs would be limited below Clarks Bridge on river right, Sentinel Beach, and Cathedral Beach.
  - Restrict private boating to 100 trips per day through a permit system; monitor use to ensure protection of river values. Restrict private boats to the section of river between the Clarks Bridge and Cathedral Beach.
  - Allow commercial boating between Housekeeping Camp and Sentinel Beach, with staging at Housekeeping Camp. Limit commercial trips to 75 boats at one time (approximately 200 trips per day). Monitor commercial use through a commercial use authorization.
- Improve the Cathedral, Sentinel, and Swinging Bridge picnic areas.
- Convert some of the Housekeeping Camp lodging area into a day use area with access to the river and picnicking facilities.
- Create opportunities for picnicking adjacent to some parking areas, such as Residence 1, Yosemite Village, Church Bowl, and Happy Isles.
- Reduce the Housekeeping Camp restrooms; retain shower houses and laundry; remove the grocery store.
- Remove the Concessioner Stable and restore the area to natural conditions.

- Retain Curry Village raft rental.

### ***Visitor Overnight Capacity: Camping***

Camping would be significantly increased in Yosemite Valley, while ensuring that this activity occurs in appropriate locations, protective of river values:

- **Backpackers Camp:** Remove all 25 sites, 21 of which are in the 100-year floodplains, 16 new sites would be replaced west of Backpackers Campground. Construct 16 new walk-in campsites west of Backpackers Camp.
- **Former Upper River Campground:** Construct a new campground with 30 walk-in sites and 2 group sites, north of the river a minimum of 150 feet away from the ordinary high-water mark.
- **Former Lower River Campground:** Construct a new campground with 40 walk-in sites, 150 feet away from the ordinary high-water mark.
- **North Pines Campground:** Retain 52 campsites. Remove 34 sites from within 150 feet of the ordinary high-water mark; restore native riparian communities.
- **Upper Pines Campground:** Retain 238 campsites. Construct a new recreational vehicle campground loop with 36 RV sites. Construct a new walk-in campground with 49 individual sites and 2 group sites.
- **Lower Pines Campground:** Retain 61 campsites. Remove 15 sites from within 150' of the ordinary high-water mark.
- **New Campground near Yosemite Lodge:** Construct a new campground with 20 RV sites near the parking area west of Yosemite Lodge
- **Camp 4:** Retain 35 walk-in campsites and 35 parking spaces. Construct 35 additional campsites east of Camp 4; establish a new parking area (41 spaces) for the Camp 4 campground expansion in the disturbed footprint of the former service station near Camp 4.
- **New Campgrounds near Curry Village:** Construct a new campground with 41 drive-in sites at the former site of the concessioner stable. Construct a new campground with 40 walk-in campsites at Boys Town; provide 2 parking spaces for each site (78 new spaces along the roadway and 12 new spaces along the eastern edge of the Orchard parking area).

### ***Visitor Overnight Capacity: Lodging***

Lodging would be reduced to allow for ecological restoration. Lodging would total 823 units accommodating up to 2,826 people per night. Common to Alternatives 2-6, The Ahwahnee would continue to provide 123 lodging rooms. The following additional lodging would be retained, removed, or constructed under Alternative 4:

- **Curry Village:** Retain 355 lodging units: 290 tents, 18 units at Stoneman House, and 47 hard-sided cabin with bath units. Remove all existing cabins and associated structures at Boys Town. Provide 300 designated overnight parking spaces at Curry Orchard; restore ecological conditions to part of the existing parking area (removing 50 spaces) to improve natural surface flows to Stoneman Meadow.
- **Housekeeping Camp:** Retain 100 lodging units, associated restrooms, shower houses, and laundry. Remove 166 lodging units (83 duplex lodging units, 4 restrooms, store and office) out of the observed ordinary high water mark.
- **Yosemite Lodge:** Retain 245 lodging units and associated services and facilities (food service, parking).

### *Visitor Day-use Parking Capacity and Transit Options*

Alternative 4 would reduce the maximum daily visitation to Yosemite Valley. The day parking, regional transit, and tour bus capacities would accommodate up to 7,554 day users at one time in Segment 2, as listed below.

- Reduce available day-use parking spaces (- 292 spaces) for a total of 2,045 parking spaces accommodating a maximum of 5,337 people at one time.
- Accommodate an estimated 1,160 people at one time in circulation on Valley roads.
- Accommodate a maximum of 337 people at one time arriving to the Valley on regional transit.
- Retain tour bus parking at 15 spaces accommodating up to 720 people at one time.

Conceptual site drawings for the Yosemite Village Day-use Parking Area and the new parking lot west of Yosemite Lodge under Alternative 4 have been completed to allow the analysis of impacts of these potential projects. See "Conceptual Site Drawings" at the end of the Alternative 4 discussion for site details and design drawings.

Visitor circulation would be improved to reduce traffic congestion and to provide a better arrival experience for visitors. Major actions would include the following:

- Redesign day parking at Yosemite Village to provide 750 designated parking spaces and a new comfort station.
- Construct a parking lot with 150 designated day parking spaces and a new 3,000 square foot comfort station west of Yosemite Lodge; provide 15 bus loading/unloading spaces.

Day users would also be able to access Yosemite Valley via by parking in the new El Portal remote parking area (200 parking spaces) and taking a shuttle to the Valley.

Due to the reductions day use parking supply in this alternative, as compared to current peak demand, an East Yosemite Valley Day-use Parking Permit System would be instituted.

Regional transit service would expand and shuttle bus service would be improved, as shown in Table 8-34.

**TABLE 8-34: TRANSIT OPTIONS - ALTERNATIVE 4**

Regional Transit Options	
HWY 140 Merced/Mariposa to Yosemite Valley	8 runs per day (4 from Merced; 4 from Mariposa) (year round)
HWY 41 Fresno/Oakhurst to Yosemite Valley	4 runs per day
HWY 120 West Groveland/Sonora to Yosemite Valley	2 runs per day (summer only)
HWY 120 East Inyo/Mono County (Mammoth Lakes) to Yosemite Valley	1 run per day (summer only)
Yosemite Valley Shuttle Options	
East Yosemite Valley	5 minute peak interval between buses year-round except Visitor Center direct
Visitor Center Express Yosemite Valley Day-use Parking Area to Visitor Center	15 min. interval between buses (summer only)
El Capitan Crossover	30 min. interval between buses (summer only)
West Yosemite Valley	Expand Valley Shuttle service to Bridalveil (summer only) 60-minute interval between buses and stops at El Capitan picnic area, El Capitan Meadow, Bridalveil Fall straight, Cathedral Beach, Yellow Pine, and Four-mile/ Swinging Bridge.

### ***Administrative Activities***

Some administrative activities would be relocated:

- Relocate the Yosemite Lodge housekeeping and maintenance facilities to a location behind the Yosemite Lodge cafeteria.

### ***Employee Housing and Employee Parking***

Compared to existing conditions, 228 fewer concessioner employees would be housed in Yosemite Valley. The remaining housing for 923 concessioner employees would be provided as follows:

- Retain housing for 42 employees at The Ahwahnee Hotel.
- Provide housing for 387 employees at Curry Village.
  - Retain permanent housing in the Curry Village residential area (223 employees)
  - Remove housing at Curry Village stable (49 employees)
  - Construct 16 buildings housing 164 employees.
- Provide housing for 390 employees at Yosemite Village:
  - Retain permanent housing at Indian Creek, Lost Arrow, and Upper Tecoya (65 employees)
  - Retain Ahwahnee Row, Y Apartments, garage housing, and Hospital Row (43 employees)
  - Retain Tecoya Dorms (232 employees)
  - Construct new housing at Lost Arrow (50 employees)
- Provide housing for 104 employees at Yosemite Lodge:
  - Construct new housing for 104 employees at Yosemite Lodge (two structures with 26 double-occupancy units each)

Four group administrative campsites (up to 120 people) would be retained at the Yellow Pine Administrative Campground.

### ***Segment 3: Merced Gorge (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 3 for Alternative 4 are included in the “Actions Common to Alternatives 2-6” (page 8-53).

#### **User Capacity, Land Use and Facilities Management**

This alternative would provide for similar kinds and amounts of use that exist today. The majority of actions for Alternative 4 in Segment 3 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

#### ***Visitor Activities and Services***

Only private boats would be allowed in this segment in this alternative. It is expected that the craft used would be kayaks in this segment. Boaters would be allowed on the river below Pohono Bridge (in Segment 2) and run

the river into El Portal (Segment 4). Boaters would be allowed to put in and take out at any of the roadside pull outs. This use would be managed by a permit system and restricted to 10 boats per day.

### ***Transit Options***

Public transit options along this segment would be expanded as described in the Yosemite Valley segment (see “Segment 2- Transit Options” above).

## ***Segment 4: El Portal (Scenic Segment)***

### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 4 for Alternative 4 are addressed in “Actions Common to Alternatives 2-6” (see page 8-53).

### **User Capacity, Land Use and Facilities Management**

This alternative would provide for similar kinds and amounts of use that exist today. User capacity in this segment would mostly be affected by increased employee housing in El Portal. While all new units would be built outside of the 100-year floodplain, they would be located within the river corridor.

### ***Visitor Activities and Services***

Most visitor activities and services in Segment 4 are considered in “Actions Common to Alternatives 2-6” (see page 8-77). Additional actions are listed below:

- Private boats would be allowed in Segment 4. Expected use would be mostly rafts and kayaks. Boaters would be permitted below Yosemite View Lodge to beyond the Foresta Bridge (at which point boaters would exit the segment.) Boaters would be able to use put-ins and take-outs below the hotel, at the store/gas station and the Red Bud launch site. This use would be regulated through a permitting system that allows for up to 10 boats per day.

### ***Visitor Overnight Use***

No visitor overnight accommodations on NPS lands are proposed in this alternative.

### ***Visitor Day Use Capacity***

Visitor day-use parking would be expanded in Segment 4. A new remote visitor day-use parking area accommodating a maximum of 200 vehicles would be provided at the Abbieville Site. This parking area would primarily be used for visitor access to Yosemite Valley. The use associated with this parking area is accounted for in the Valley daily visitation levels reported above (see “Visitor Day-use Parking – Segment 2,” above).

The day-use parking capacity specific to this segment would not change. Segment 4 would have 214 visitor parking spaces accommodating up to 740 people at one time.

### ***Administrative Activities***

All administrative activities in Segment 4 are considered in “Actions Common to Alternatives 2-6” (see page 8-53).



### ***Employee Housing Capacity***

In Alternative 4, high density employee housing would be added to the El Portal Village Center (12 beds) and a dormitory in Rancheria Flat (96 beds). All new units would be outside of the 100-year floodplain. These units would be added to accommodate for the units removed from Yosemite Valley. The total housing capacity for El Portal would be 300 people.

### ***Employee and Administrative Parking Capacity***

Most employee and administrative parking actions are discussed in “Actions Common to Alternatives 2-6” (see page 8-53). This additional housing would also include 108 new employee overnight parking spots with the new housing units being built in El Portal Village Center and Rancheria Flat.

### ***Transit Options***

Regional transit options would maintain existing service along the Highway 140 corridor. For a complete summary of transit activity that passes through this segment, see the “Segment 2- Transit Options” section, above.

## ***Segment 5: South Fork Merced River above Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions in Alternative 4 that are specific to this segment.

### **User Capacity, Land Use and Facilities Management**

Alternative 4 would provide for similar kinds and amounts of use that exist today in Segment 5. The majority of actions for Alternative 4 in Segment 5 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Only five boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

### ***Transit Options***

Specific transportation options for reaching Segment 5 trailheads are listed below under Segment 7.

## ***Segments 6 and 7: Wawona and Wawona Impoundment (Recreational Segments)***

### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (see page 8-53), protection and enhancement of Cultural Values and Water Quality would be accomplished through the actions described below.

### ***Cultural/Water Quality***

- **Campgrounds:** Remove sites that are either within the 100 year floodplain or in culturally sensitive areas.

### **User Capacity, Land Use and Facilities Management**

This alternative would provide for similar kinds and amounts of use that exist today. The majority of actions for Alternative 4 in Segment 7 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

#### ***Visitor Activities and Services***

Most visitor activities and services in Segment 7 are considered in “Actions Common to Alternatives 2-6” see page 8-53) Additional actions are listed below:

- Retain the Wawona Golf Course and Tennis Courts.
- Discontinue commercial day rides and repurpose the Wawona stables.
- Allow only private boats in Segment 7. Expected use would be mostly kayaks and other small whitewater boats. Boaters would be permitted below Swinging Bridge to beyond the park line, with the exception of the Wawona impoundment. Boaters would be able to use put-ins and take-outs at Swinging Bridge, the store area, South Fork Picnic Area and below the campground. This use would be regulated through a permit and monitoring system that would restrict use to 5 boats per day.

#### ***Visitor Overnight Capacity***

The overnight capacity for Segment 7 would be 176 units accommodating up to 703 people per night.

The Wawona Campground would reduce campsites to 70 sites (444 people). This includes one group camping site (to accommodate up to 30 persons).

The two stock campsites that would be relocated to the Wawona stables and would accommodate 6 people per night each (12 people per night total).

#### ***Transit Options***

Tour bus parking would be formalized and all shuttles would remain. In-park shuttle options between Wawona and Yosemite Valley would continue existing service. New regional transit options would be provided along the Highway 41 corridor with four runs between Fresno and the Valley along Hwy 41 would be added. Additionally, the shuttle between Wawona and Yosemite Valley would be expanded to 2 runs per day. Maximum capacity from regional in this segment would be 104 people at one time.

### ***Segment 8: South Fork Merced River below Wawona (Wild Segment)***

#### **Actions to Protect and Enhance River Values**

There are no actions in Alternative 4 that are specific to this segment.

## **User Capacity, Land Use and Facilities Management**

Alternative 4 would provide for similar kinds and amounts of use that exist today in Segment 8 and significant changes are not proposed. The majority of actions for Alternative 4 in Segment 8 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in Segment 7. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Up to five boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

### ***Transit Options***

Transit services for access to this segment are described above under Segment 7.

## **Analysis of Facilities and Services**

Table 8-35 presents the park’s assessment of the particular facilities and services that would be needed to support public use and/or to protect river resources based on the types, levels, and locations of use proposed for Alternative 4. As an example, the goals of this alternative include a resource-based visitor experiences and targeted riverbank restoration. This alternative prescribes targeted restoration within 150 feet of the Merced River and visitor use levels that are slightly lower than the peak levels experienced in the recent past. Visitor facilities and services would be resource-based and additional camping opportunities would be provided in Yosemite Valley, therefore making it possible to convert the Concessioner Stables and Boys Town into campgrounds and providing walk-in camping at the Upper and Lower River Campgrounds.

**TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 1: Wild</b>			
Merced Lake High Sierra Camp	Removed and restored to natural conditions	<b>No:</b> This facility is not needed to support public use because use levels are substantially lower. Therefore, the level of overnight accommodations and camping is substantially lower, and this facility can be removed.	<b>No:</b> The High Sierra Camp is outside designated Wilderness; however it is surrounded by designated wilderness. Designated wilderness precludes the construction of new facilities such as this. Alternatives in Chapter 8 consider various means of addressing impacts to ORVs.
Merced Lake Backpackers Camping Area	Designated camping expanded	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to allow support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Little Yosemite Valley Camping Area	Reduced designated camping area	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Moraine Dome Camping Area	Retained as designated camping	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
<b>Segment 2: Curry Village and Campgrounds</b>			
Upper Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Lower Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.

TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
North Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Backpackers Campground	Removed (partially re-located)	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience. In addition, this campground provides is critical for backpackers who need to start or end their wilderness trip in Yosemite Valley.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Valley Campground Reservation Center	Re-located (due to Southside Drive re-routing)	<b>Yes:</b> The Valley Campground Reservation Center is an essential National Park Service point-of-contact for campers, and those who seek campsites, in Yosemite Valley. The Campground Reservation Center staff sells campsite reservations for all campsites in the park available for reservations. The Reservation Center is operated on a year-round basis.	<b>Yes.</b> The Campground Reservation could be moved from its existing location. However, it is important to the successful delivery of services provided from the reservation center that any alternative location be near the Valley campgrounds.
Housekeeping Camp Lodging Units	Reduced	<b>Yes:</b> Housekeeping Camp offers rustic overnight guest accommodations for visitors who do not or are unable to camp. The number of units allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> No alternative areas of sufficient size to accommodate this lodging facility (adjacent to the river, which is an integral part of the overnight experience )are available for development in Yosemite Valley.
Housekeeping Camp Laundry	Retained	<b>Yes:</b> The public laundromat at Housekeeping Camp is a small facility that supports visitor use. The nearest public laundry facilities outside the park are located 50 miles from Yosemite Valley. Visitors spending multiple nights in the park frequently need to launder their clothing, and, in some cases, sleeping bags, blankets or other outdoor items.	<b>No.</b> This service is provided for Housekeeping Camp guests and is directly linked to the camp; relocating the service and providing a general laundry facility for park visitors is not necessary.
Housekeeping Camp Shower Houses and Restrooms	Shower House Retained. Restrooms reduced.	<b>Yes:</b> Public restrooms are needed in many areas throughout the river corridor to comply with public health regulations and meet the basic personal needs of visitors and employees. The public showers at Housekeeping Camp are provided for guest use as well as other patrons, including campers and hikers.	<b>No.</b> The Housekeeping Camp restrooms and shower houses are components of the overnight guest accommodations at this location. They are required to be located within or very near the overnight sleeping units.
Housekeeping Camp Grocery	Service eliminated / facility removed	<b>No:</b> This need for the grocery store is tied to the level of lodging units at Housekeeping Camp. With a reduction of lodging, the grocery store is not needed.	<b>N/A:</b> This service will be eliminated.

**TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Curry Village Lodging and Shower Houses	Reduced	Yes: Curry Village offers rustic and economy overnight guest accommodations consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs. This facility is needed to support public use by visitors who do not camp.	No. This lodging facility is part of a National Register Historic District. It is not feasible to relocate the complex, including shower and toilet facilities needed by guests in without-bath accommodations, to locations outside the river corridor.
Curry Village Overnight Parking	Reduced	<b>Yes:</b> Parking at Curry Village is needed to support the day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Orchard Parking Area	Reduced	<b>Yes:</b> Parking at Curry Village Orchard is needed to support day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Village Raft Rental	Reduced (need commercial-use permit)	<b>Yes:</b> Consistent with the land use restoration and visitor experience goals of this alternative, raft rentals are necessary.	<b>No.</b> By its very nature, the raft rental facility should be located within the river corridor.
Concessioner Stables	Re-purposed as campground	<b>No:</b> The stable operation at Curry Village is not necessary as the High Sierra Camp operations are eliminated under this alternative, as are horseback day rides.	<b>No.</b> There are no other suitable locations for a stable operation, neither in proximity to other visitor services nor proximity to the Valley trail system used to access the Merced Lake High Sierra Camp.
Concessioner Stables Employee Housing Area	Removed	<b>No:</b> Under this alternative this housing facility is not necessary to accommodate a employees who provide visitor services due to a reduced level of visitor services.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Retained	<b>Yes:</b> This road is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that connects all major visitor service nodes. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway from its present location.
Southside Drive (through Stoneman Meadow)	Roadway section removed	<b>No:</b> Under this alternative this segment of Southside Drive through Stoneman Meadow is and traffic is routed through Curry Village giving pedestrians, bicycles, NPS law enforcement and fire protection access the east Yosemite Valley. This change in traffic circulation for Yosemite Valley would be feasible due to substantial reduction in visitor use levels.	<b>N/A</b> This section of roadway is removed and traffic is re-routed to Yosemite Valley destinations using nearby roadway sections.



TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Sugar Pine Bridge	Removed	<b>No.</b> Under this alternative this pedestrian, bicycle, and emergency vehicle bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would be re-routed north of river so that visitors can access points of interest in Yosemite Valley. Removal of this bridge will restore free-flowing conditions and riparian habitat.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Ahwahnee Bridge	Removed	<b>No.</b> Under this alternative this pedestrian, bicycle, and emergency vehicle bridge is not needed to support public use of the river corridor. Pedestrian, bicycle, NPS law enforcement and fire protection traffic would be re-routed north of river so that visitors can access points of interest in Yosemite Valley. Removal of this bridge will restore free-flowing conditions and riparian habitat.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Stoneman Bridge	Retained	<b>Yes:</b> This pedestrian, bicycle, and emergency vehicle bridge is needed to support public use of the river corridor. It allows safe crossing of the Merced River so that visitors can access points of interest in Yosemite Valley. Pedestrian and bicycle bridges also protect riparian habitat from destruction caused by random crossings throughout the river corridor. It is also used for by NPS for law enforcement and fire protection.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Upper Pines RV and Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Former Upper River Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Former Lower River Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Boys Town Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.

**TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Concessioner Stables Area Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
<b>Segment 2: Yosemite Village and Housekeeping Camp</b>			
Ahwahnee Row Employee Housing	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lower Tecoya Employee Housing Area	Retained	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services consistent with the land use restoration and visitor experience goals of this alternative.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lost Arrow Employee Housing Area	Re-developed (with permanent housing)	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services consistent with the land use restoration and visitor experience goals of this alternative.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Re-aligned intersection of Northside Drive and Village Drive, with three-way entry into the Yosemite Village Day-use Parking Area	Redesigned intersection with 1 pedestrian crossing on west side of intersection	<b>Yes:</b> This intersection of Northside Drive, Village Drive, and the entrance into the Yosemite Village Day-use Parking Area is a critical intersection in Yosemite Valley. Northside Drive is the exit road for all East Yosemite Valley traffic. Pedestrians cross the road to access numerous visitor services including the primary visitor center, museum, and the Valley shuttle.	<b>No.</b> While some changes to the exact location of the intersection are feasible; the intersection could not be removed in its entirety unless a suitable replacement that would accommodate high volume westbound traffic.
Yosemite Village Day-use Parking Area	Re-developed and expanded	<b>Yes:</b> This facility will serve as the primary day-use parking lot for Yosemite Valley because it is proximate to numerous visitor services including the primary visitor center, museum, and the Valley shuttle. A day-use visitor parking area of this size is needed to support the level of public use that has been found to protect and enhance river values.	<b>No.</b> While some changes to the exact location of the parking lot and road system leading to the parking lot could be feasibly relocated, the parking lot could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor parking in Yosemite Valley is identified.

TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp (cont.)</b>			
Residence 1 (Superintendent's House)	Relocated	<b>Yes.</b> This historic structure is a component of the Historic Resources ORV and would be rehabilitated and used to support the visitor experience.	<b>Yes.</b> Under this alternative, the facility would no longer be a component of the Historic Resources ORV and could be relocated outside the river corridor to the lower NPS housing area.
<b>Segment 2: Yosemite Lodge and Camp 4 Area</b>			
Yosemite Lodge Overnight Units	Retained	Yes: Yosemite Lodge offers mid-scale and economy overnight guest accommodations for visitors who do not or are unable to camp. The number of units allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	No. While some buildings within the Yosemite Lodge complex could be relocated to sites further north of the Merced River, however, it is not feasible to consider a wholesale relocation of the complex to an alternative location.
Yosemite Lodge Overnight Parking	Retained	<b>Yes:</b> Parking is needed to support visitors who stay at Yosemite Lodge. Parking is also needed for park partner organizations and NPS staff who use the Lodge's meeting and interpretive spaces (i.e., the Cliff Room, Gardner Terrace, and the outdoor amphitheater).	<b>No.</b> As long as visitor services are provided at Yosemite Lodge, it will be necessary to provide parking near the Lodge complex.
Yosemite Lodge Garden Terrace and Cliff Room	Retained	<b>Yes:</b> These areas are used for interpretive programs and for training courses, meetings, and special events. These facilities are vital to National Park Service and park partner operations.	<b>No.</b> The Garden Terrace and Cliff Rooms are within the existing buildings at the Yosemite Lodge complex. The activities taking place at these locations could be considered for relocation to alternative facilities; however, it is not feasible to consider removing the buildings in their entirety.
Yosemite Lodge Gift and Grocery	Reduced	<b>Yes:</b> The facility provides visitors a limited range of merchandise including packaged and fresh groceries, sundries, and outdoor products frequently needed by campers and hikers.	<b>No.</b> The building currently housing the Yosemite Lodge Gift and Grocery Store is part of the Yosemite Lodge food service and retail structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Mountain Room Bar & Food Service	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room Bar is part of the Yosemite Lodge food service structure and would be infeasible to relocate.

**TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Lodge and Camp 4 Area (cont.)</b>			
Yosemite Lodge Mountain Room Restaurant	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room restaurant is part of the Yosemite Lodge food service structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Highland Court Employee Housing (Existing and New)	Replaced with permanent housing proximate to current location	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
Yosemite Lodge Employee Housing (Thousands Cabins) (Existing)	Removed and relocated (incorporated into permanent housing above)	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
West of Lodge RV Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> No alternative areas of sufficient size or location could accommodate this campground.
Yosemite Falls Pedestrian Underpass (New)	Constructed	<b>Yes:</b> A pedestrian underpass is vital to reduce pedestrian and vehicle conflicts at this extremely busy intersection area. The pedestrian underpass would connect the pedestrians from the Yosemite Lodge Area to the Lower Yosemite Fall Area without requiring westbound traffic on Northside Drive to stop and allow pedestrians to cross the road.	<b>No.</b> No changes are proposed for the existing road system in Yosemite Valley. Improvements for this location are required to increase efficiency of transportation circulation.
Yosemite Lodge Day-use Parking Area (New)	Constructed	<b>Yes:</b> This facility will serve as a critical day-use parking lot for Yosemite Valley because substantial numbers of roadside parking spaces adjacent to meadows will be removed in the vicinity of the Yosemite Village Day-use Parking Area. This new parking area will serve as trailhead parking for the upper and lower Yosemite Falls trail, and overflow evening parking for Camp 4 Campground. It will also be used for the Waghoga Cultural Center.	<b>No.</b> No alternative areas of sufficient size or location proximate to upper and lower Yosemite Falls trailhead, Waghoga, Camp 4 and the Yosemite Lodge could accommodate this parking area.

TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: West Yosemite Valley</b>			
Yellow Pine Campground	Retained	<b>Yes:</b> This administrative camping area is used by volunteers and researchers whose work is critical to meeting our NPS mission.	<b>No.</b> No alternative areas of sufficient size or location could accommodate this campground.
<b>Segment 4: El Portal</b>			
Rancheria Employee Housing Area (New)	Constructed	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs, and to accommodate employees who provide resource protection services consistent with the mission of the National Park Service and current agency management policies.	<b>No.</b> In-fill employee housing should occur within existing employee housing areas
El Portal Remote Parking at Abbieville / Trailer Village (New)	Constructed	<b>Yes:</b> This parking area will provide a vital queuing and staging area during peak use periods when congestion in the East Yosemite Valley reaches conditions whereby the National park Service would not permit more vehicles to add to the crowding. Day-use visitors would be provided shuttle service to Yosemite Valley from this location.	<b>No.</b> There are no other suitable locations proximate with direct access to Highway 140 before entering Yosemite National Park boundary.
<b>Segment 5 (Wild), Segments 6 &amp;7 (Recreational), Segment 8 (Wild)</b>			
Wawona Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> This campground could not be relocated as no suitable alternative site exist in the Wawona proper adjacent to the river, which is an integral part of the camping experience.
Wawona Hotel Tennis Court	Retained	<b>Yes:</b> This visitor activity is a component of the Wawona Hotel NHL. Opportunities for this type of visitor recreation are unique in terms of setting attributes and the historic setting of the district.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.
Wawona Hotel Golf Course & Shop	Retained	<b>Yes:</b> This visitor activity is a component of the Wawona Hotel NHL. Opportunities for this type of visitor recreation are unique in terms of setting attributes and the historic setting of the district.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.

**TABLE 8-35: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 4**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 5 (Wild), Segments 6 &amp; 7 (Recreational), Segment 8 (Wild) (cont.)</b>			
Wawona Stables	Retained	<b>Yes:</b> The Wawona Stables offer visitors commercial equestrian day rides to points of interest in the Wawona area. This facility is necessary to support horseback riding, which is a type of use that has been found to be consistent with the protection and enhancement of river values.	<b>No.</b> The stable operates from a historic structure that could not be feasibly relocated.
Wawona Commercial Horseback Day Rides	Eliminated	<b>No:</b> Opportunities for this type of visitor recreation is not a vital visitor service under this alternative.	<b>N/A:</b> This service will be eliminated.



## **Conceptual Site Drawings**

### ***Boys Town***

In Alternative 4, the existing Boys Town cabins and facilities would be removed and replaced with 40 walk-in campsites. Each of the campsites would have 2 parking spaces for a total of 90 spaces, in addition to 78 new parking spaces along the existing roadway, and 12 new spaces along the eastern edge of the Orchard parking area. A new pedestrian walkway, a comfort station with showers, and a guest check-in building would also be constructed within the existing developed footprint. The Curry Orchard Day-use Parking Area would be partially restored to facilitate Stoneman Meadow restoration, while retaining approximately 300 parking spaces. New ground disturbance within the existing 8.4 acre footprint of Boys Town would include approximately 4,000 square feet for new buildings, 2,000 square feet of utility trenching, 153,860 square feet for the new camping area, 4,300 square feet for a plaza and pedestrian pathways around the comfort station, and 27,000 square feet of new parking for a total of 4.4 acres. Construction staging would require an area of approximately 1.4 acres and would likely take place within the existing Orchard parking area.

### ***Yosemite Village Day-use Parking Area***

In Alternative 4, the existing 6-acre Yosemite Village Day-Use Parking Area would be moved northward 150 feet away from the river to facilitate riparian restoration goals and to prevent further resource damage. Restoration actions would remove non-native fill material, re-contour the topography, and plant native vegetation. The redesigned parking area would be formalized to provide a total of 750 parking spaces and a new comfort station. The intersection would be realigned at Northside Drive and Village Drive to address traffic flow on peak days. The Concessioner General Office and Garage, Arts and Activities Center (former bank building) would be removed and the Village Sport Shop repurposed to a visitor contact station.

The area of disturbance for improvements at Camp 6 in Alternative 4 would cover approximately 27.5 acres and include 19 acres of clearing and grubbing, 1.1 acres for existing building removal, 4,000 square feet for the new comfort station, 5.4 acres of pavement removal, 2.2 acres of new roadway, 5.1 acres for new parking, 15,220 square feet of utility service trenching, and 43,350 square feet for new pedestrian pathways. Construction staging would cover an area of approximately 2 acres.

### ***Yosemite Lodge Parking Area***

In Alternative 4, the area west of Yosemite Lodge, currently used as parking for tour buses, transit buses and overnight guests, would be re-developed to provide 150 day-use parking spaces, designated campsites for 20 RVs, parking for 15 buses, a new 3,000 square foot comfort station, and a re-located shuttle stop. The existing tour bus drop off area would be relocated to the Highland Court area. The wellness center, linen storage and laundry buildings would be removed. Ground disturbance within a 11.2 acre footprint west of the Lodge would include 8.6 acres of clearing and grubbing, 55,850 square feet of existing building and pavement removal, 3,000 square feet for the new comfort station and shuttle stop, 13,300 square feet of utility service trenching, 2.5 acres for parking, and 2,500 square feet for pedestrian pathways. Construction staging would take place over a 2 acre area within the existing footprint. Existing vegetation would be retained to separate and screen parking bays while bioswales would serve to filter and treat storm water run-off.

### *Yosemite Lodge Housing*

In Alternative 4, the temporary modular housing at Highland Court and the Thousand Cabins would be removed and replaced with two new buildings to house 104 concessioner employees. In addition, a new parking area would provide 78 employee parking spaces, parking for 3 shuttle buses loading spaces, and 53 day-use parking spaces for the public. Ground disturbance for the two housing sites would cover a total of 7.4 acres and would include 45,500 square feet of preparation for the new buildings, 5,500 square feet of utility service trenching, and 1.8 acres for parking.

### *Concessioner General Office*

The 18,000 square foot Concessioner General Office building located in Yosemite Village, just south of the Village Store parking lot, would be removed to allow redesign and expansion of visitor parking, improved traffic and pedestrian circulation and resource restoration. The office space would be replaced by reconfiguring the interior of the existing Concessioner Maintenance and Warehouse building located east of the NPS Government Utility Area. The existing structure would be updated to include office space on a mezzanine floor. In addition to this, nearby existing concessioner employee housing would be converted to office use. The residential needs of employees displaced from housing facilities would be accommodated in other buildings in Yosemite Valley.

Additional parking spaces for vehicles associated with the existing and relocated maintenance and warehousing operations, administrative vehicles and private vehicles used by employees would be expanded near the facility to accommodate the increased occupancy of the remodeled worksite. Specific locations being considered for parking include formalizing approximately 17 spaces along Village Drive, 6 spaces to the northeast of the warehouse building, approximately 16 spaces along Boulder Lane, approximately 15 spaces along the north side of Tenaya Way and an additional 15 spaces north of the existing auditorium. Development of parking spaces behind the auditorium would require the removal of one existing employee residence.





#### Huff House Employee Housing

Replace temporary housing with permanent facilities,  
164 beds and 164 parking spaces

- 1 Construct 4 two-story buildings for 32 occupants, 8 occupants per building.
- 2 Construct 11 two-story buildings for 132 occupants, 12 occupants per building.
- 3 Provide common recreational area, approximately 3,600 square feet.
- 4 Build plaza areas and walkways with site furnishings, accent paving, and enhanced landscaping.
- 5 Construct a shuttle bus stop.
- 6 Remove ice rink and bicycle rentals. Construct an employee parking facility with 164 spaces.
- 7 Retain historic residence for housing purposes.

#### Curry Orchard Parking Area

- 8 Improve parking facility with 300 spaces and landscape buffers with trees and bioswales that will treat storm water run-off. Provide pedestrian walkways.

#### Stoneman Meadow Restoration

- 9 Remove Stoneman Road and adjacent recreation trail. Extend boardwalk from existing terminus (at Stoneman Road) to Curry Village Pavilion area. Improve hydrology, remove invasive species, promote weed control and plant native species.

#### Boys Town

- 10 Replace existing guest accommodations with a walk-in campground consisting of 40 sites.
- 11 Construct restroom with showers.
- 12 Construct a roadway to connect Curry Village and East Valley campgrounds. Provide additional roadside parking.
- 13 Relocate Campground Reservation Center and provide 8 parking spaces.

#### Existing Curry Village Visitor Services

- 14 Retain existing historic cabins and Stoneman Cottage (65 lodging units).
- 15 Retain existing Curry Pavilion.
- 16 Retain 290 tents.

\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



NORTH

### Alternative 4 Conceptual Site Drawing for Curry Village

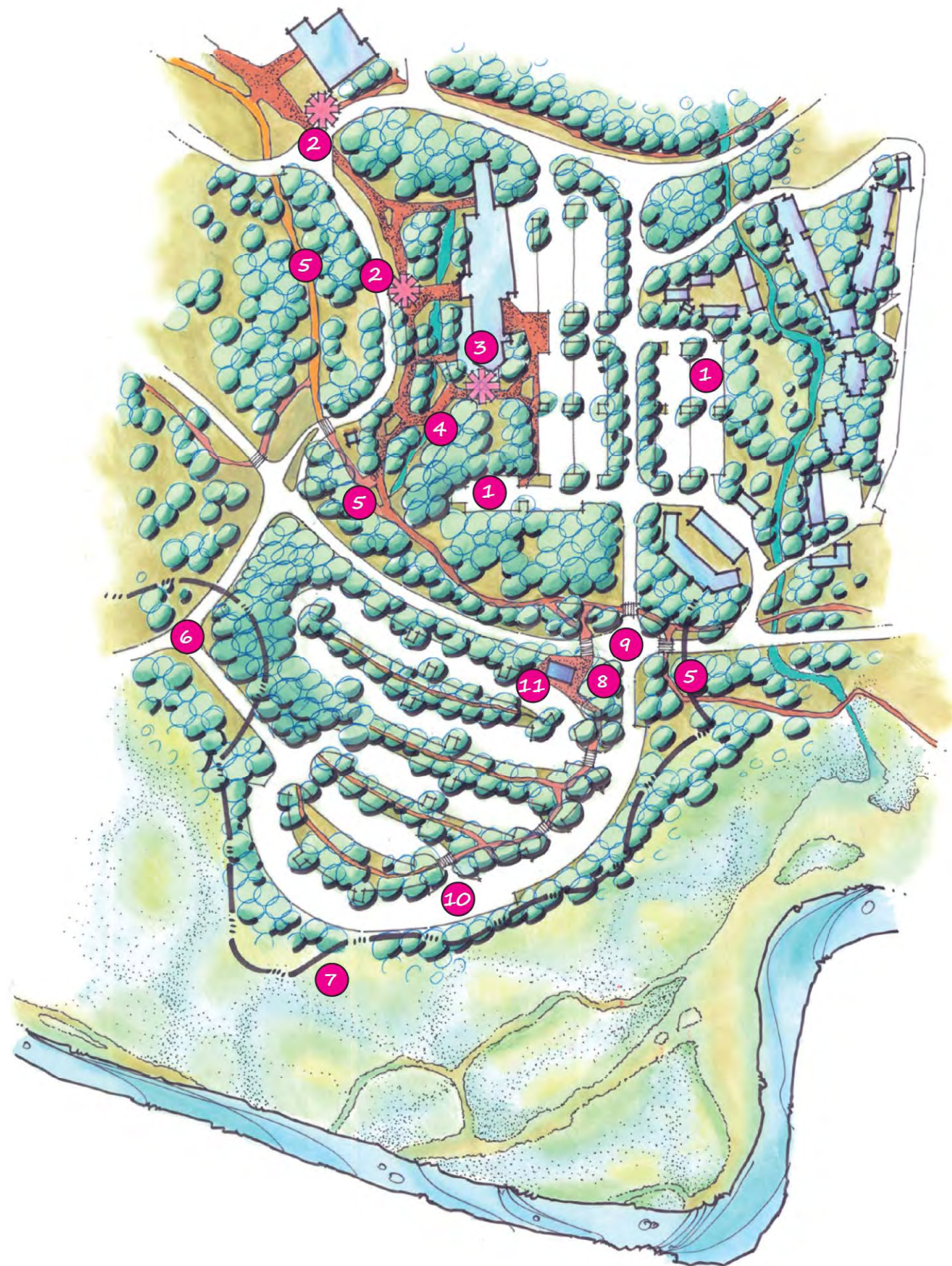
Yosemite National Park

United States Department of the Interior • National Park Service



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- 1 Eliminate Concessioner General Office and Garage between the Village Store and Ahwahnee Meadow, providing more space for visitor parking.
- 2 Retain shuttle stops on Visitor Center Loop Drive.
- 3 Replace Village Sport Shop with visitor contact station.
- 4 Eliminate art activity center and improve pedestrian access.
- 5 Improve pedestrian connections and bike paths east and west of the day-use parking area.
- 6 Provide a two-way access driveway from Sentinel Drive as the primary entrance to the day-use parking area.
- 7 Redesign the day-use parking area to provide a 150-foot buffer from the river. Restore wetlands and meadow.
- 8 Create pedestrian pathways to lead visitors into the Yosemite Village mall. Construct a comfort station in a central location connected to the main pedestrian concourse.
- 9 Remove offset intersection and re-align day-use parking area driveway as a conventional four-way intersection at Village Drive and Northside Drive. Shift pedestrian crosswalk on Northside Drive from the east to the west side of this intersection.
- 10 Provide 750 day-use parking spaces. Design planters to retain large numbers of trees, including bioswales that eliminate pollutants from parking area. Create pedestrian pathways with a wayfinding system leading visitors to the Yosemite Village mall.
- 11 Relocate shuttle bus pick-up and drop-off area. Replace comfort station.



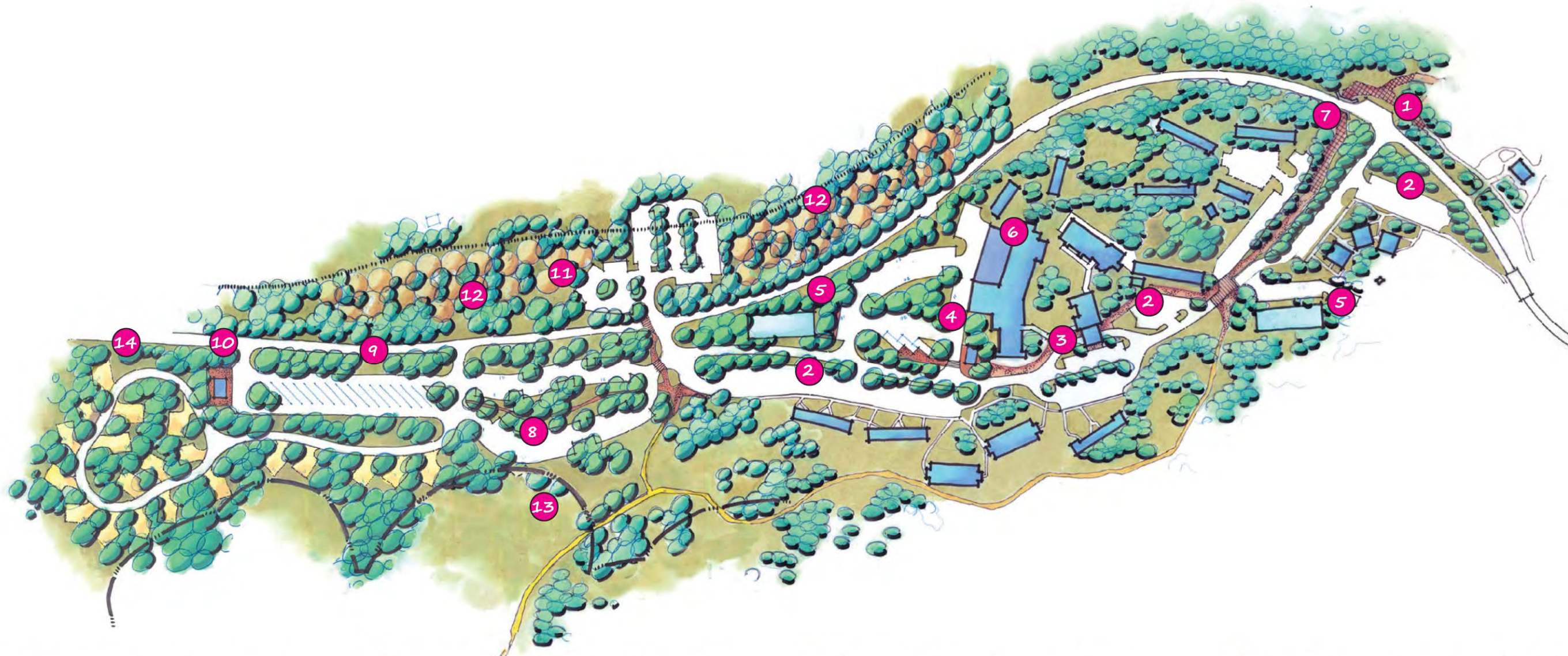
**Alternative 4**  
**Conceptual Site Drawing for**  
**Yosemite Village Day-use Parking Area**  
 Yosemite National Park  
 United States Department of the Interior • National Park Service

\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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- 1 Re-align Yosemite Lodge intersection within the limits of existing developed areas.
- 2 Maintain all existing Yosemite Lodge buildings and parking areas.
- 3 Enhance pedestrian circulation system.
- 4 Construct tour bus loading and unloading area, with shelter.
- 5 Construct employee housing in 2 two-story buildings with 52 occupants per building and 39 employee parking spaces per building.

- 6 Relocate linen storage and laundry buildings from the 100-year floodplain to an addition to the food service building. Reconfigure truck loading and unloading area. Demolish and remove existing NPS volunteer office.
- 7 Reconstruct a section of the Yosemite Lodge entrance road as a promenade with a 5% slope to a pedestrian underpass. Install accent paving, landscaping, wayfinding and site furnishings, low-voltage site lighting consistent with design features of the Yosemite Falls trail.

- 8 Construct 150 visitor parking spaces at Yosemite Lodge Day-use Parking Area. Maintain existing vegetation as buffers to separate and screen parking bays, provide pedestrian pathways and bioswales that will treat storm water run-off.
- 9 Construct 15 tour bus parking spaces.
- 10 Construct a shuttle bus stop with shelter and comfort station.
- 11 Construct 41 additional parking spaces at Camp 4.

- 12 Retain 35 existing walk-in campsites at Camp 4. Construct 35 additional walk-in sites opposite existing parking facility. Occupancy is limited to 6 campers per site. Standard walk-in campsite is 3,850 square feet (70-foot diameter), including 1,200 square feet of clearance with a 15-foot perimeter buffer.
- 13 Protect and enhance a 150-foot riparian buffer.
- 14 Construct an RV loop with 20 campsites.

\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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## **ALTERNATIVE 5 (PREFERRED ALTERNATIVE): ENHANCED VISITOR EXPERIENCE AND ESSENTIAL RIVER BANK RESTORATION**

### **Overview**

The guiding principles of Alternative 5 would include significant restoration within 100 feet of the river and in meadow and riparian areas, maintaining daily visitation in Yosemite Valley to accommodate the same peak levels observed in recent years, and reducing unnecessary facilities and services, and converting facilities from administrative use to public use where feasible.

Management actions in Alternative 5 would:

- Restore 203 acres of meadow and riparian habitat.
- Significantly increase the campsite inventory in all river segments (+28%) and in Yosemite Valley (+37%).
- Minimally increase available lodging in all river segments (less than 1%) and in Yosemite Valley (+2%).
- Increase day-use parking spaces in Yosemite Valley (+11%).
- Reduce commercial services.
- Make significant changes to the traffic circulation pattern in Yosemite Valley to accommodate ecological restoration goals and reduce traffic congestion.
- Accommodate approximately 19,900 visitors per day in East Yosemite Valley.
- Continue to manage overnight use capacity through wilderness permits and reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through intentional traffic diversions and monitoring.

### ***Actions to Protect and Enhance River Values***

Alternative 5 would protect and enhance river values through essential ecological restoration of riverbanks and riparian and meadow habitat. Targeted infrastructure within the bed and banks of the river would be removed, along with much of the development within 100 feet of the river, and the sites would be ecologically restored. This alternative would also create a valley oak habitat protection area. The free-flowing condition of the river would be enhanced by removing one bridge from the bed and banks that constricts flow during high-water events. Hydrologic connectivity of meadows to the riparian floodplain would be enhanced through engineering and design treatments, such as installation of large box culverts and permeable subgrades to improve surface water flow.

Cultural and scenic values would be protected and enhanced as described under “Actions Common to Alternatives 2-6” (beginning on page 8-53). Recreational values would additionally be protected and enhanced by dispersing lower levels of recreational boating along the river through Yosemite Valley and by reducing traffic congestion. Table 8-36 provides a summary of the additional actions that would occur under Alternative 5 to protect and enhance river values.

**TABLE 8-36: ADDITIONAL ACTIONS TO PROTECT AND ENHANCE RIVER VALUES, ALTERNATIVE 5**

<b>Ecological Restoration Actions (Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values)</b>	
<b>Corridorwide</b>	
<b>Ecological Restoration Acreage</b>	164 acres (common to all) plus an additional 39 acres (refer to Appendix E for specific locations)
<b>Riprap to be Removed</b>	5,700 linear feet (common to all) plus an additional 435 feet (refer to Appendix E for specific locations)
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Remove some facilities and reduce the capacity of the Merced Lake High Sierra Camp.</li> </ul>
<b>Segment 2: Yosemite Valley</b>	
<b>Free Flow /Geologic/ Hydrologic Values</b>	<ul style="list-style-type: none"> <li>Remove Sugar Pine Bridge to enhance the free-flowing condition of the river.</li> </ul>
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore portions of Backpackers Camp, North Pines Campground, and Lower Pines Campground.</li> <li>Ecologically restore 35.6 acres of habitat in former Upper and Lower River Campgrounds and construct new campsites 150 feet away from the river</li> <li>Move Yosemite Village Day-use Parking Area parking north at least 150 feet away from the river.</li> </ul>
<b>Recreational Values</b>	
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Wilderness Recreation</b>	<ul style="list-style-type: none"> <li>Reduce zone capacities and trailhead quotas above Nevada Fall.</li> <li>Visitor overnight use concentrated to designated camping areas</li> </ul>

### *User Capacity, Land Use, and Facilities Management*

Alternative 5 would focus on providing an enhanced visitor experience while protecting river values. It would maintain a range of recreation opportunities that are sensitive to river resources and accommodate current peak use levels (see Table 8-37). Proper infrastructure design and site delineation in high use areas would be incorporated to ensure the long-term protection of river values.

**TABLE 8-37: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 5**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 5	
	Unit Type	Units	People	Units	People
<b>Wilderness Above Nevada Fall</b>					
Visitor Overnight Use	Zone Capacities & Beds	380	380	362	362
Visitor Day Use	Day Hikers	350	350	350	350
Employee Housing	Employee Beds	15	15	15	15
Administrative Day Use	Day Patrols	5	5	5	5
<b>Yosemite Valley</b>					
Visitor Overnight Use	Rooms & Campsites	1,500	6,564	1,693	7,729
Visitor Day Use	Parking Spaces& Buses	-	8,272	-	8,954
Employee Housing	Employee Beds	1,315	1,315	1,136	1,136
Administrative Day Use	Parking Spaces	166	332	166	332
<b>Merced Gorge</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	180	869	180	869
Employee Housing	Employee Beds	9	9	9	9
Administrative Day Use	Parking Spaces	2	4	2	4

**TABLE 8-37: USER CAPACITIES BY USE TYPE AND LOCATION- ALTERNATIVE 5**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 5	
	Unit Type	Units	People	Units	People
<b>El Portal</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	214	740	414	740
Employee Housing	Employee Beds	192	192	288	288
Administrative Day Use	Parking Spaces	610	1,220	610	1,220
<b>South Fork Above Wawona</b>					
Visitor Overnight Use	Permits	20	20	20	20
Visitor Day Use	Day Hikers	6	6	6	6
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1
<b>Wawona</b>					
Visitor Overnight Use	Rooms & Campsites	203	865	190	787
Visitor Day Use	Parking Spaces& Buses	-	1,295	-	1,606
Employee Housing	Employee Beds	121	121	121	121
Administrative Day Use	Parking Spaces	30	60	30	60
<b>South Fork Below Wawona</b>					
Visitor Overnight Use	Overnight Hikers	3	3	3	3
Visitor Day Use	Day Hikers	3	3	3	3
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1

## Visitor Overnight Capacity

### Camping

The campsite inventory in the Merced Wild and Scenic River corridor and Yosemite Valley would be increased by approximately 28%. All campsites within 100 feet of the river would be removed. Campsite losses would be offset with the addition of new camping adjacent to Upper Pines Campground and east of the Camp 4 Campground, as well as new sites west of Backpackers Campground and in the former Upper and Lower River Campgrounds area. Under Alternative 5, the total number of campsites in Yosemite Valley would increase to 640—a net gain of 174 sites—and the total number of campsites available in the corridor would be 726. Table 8-38 provides a summary of the proposed changes to camping and the reasons for those proposed changes.

**TABLE 8-38: CAMPING FACILITIES- ALTERNATIVE 5**

Existing Locations	Alt 1 (No Action)	Alt 5	Details
Backpackers	25 sites	10 sites	15 walk-in sites within 100 feet of river relocated to less sensitive area outside 100-year floodplain
Camp 4	35 sites	35 sites	No change to this National Historic Register Site
Lower Pines	76 sites	71 sites	5 sites within 100 feet of the river removed
North Pines	86 sites	72 sites	14 sites within 100 feet of the river removed
Upper Pines	240 sites	238 sites	2 sites removed for cultural resource concerns
Yellow Pine Administrative	4 sites	4 sites	No changes to these group administrative sites
Wawona Campground	99 sites	86 sites	13 sites within 100 feet of river or in culturally sensitive areas removed

**TABLE 8-38: CAMPING FACILITIES- ALTERNATIVE 5**

<b>Total Existing Locations</b>	<b>565 sites</b>	<b>516 sites</b>	
<b>New Locations</b>	<b>Sites</b>	<b>Alt 5</b>	<b>Details</b>
West of Backpackers	0 sites	16 sites	16 walk-in sites relocated from Backpackers Camp to less sensitive area outside 100-year floodplain
East of Camp 4	0 sites	35 sites	35 walk-in sites constructed in area east of Camp 4
Upper Pines	0 sites	87 sites	36-site RV loop and a walk-in campground with 49 sites and 2 group sites
Former Upper River	0 sites	32 sites	30 walk-in and 2 group sites constructed in the footprint of the former Upper River Campground, but at least 150 feet from the river
Eagle Creek		42 sites	40 auto sites and 2 group campsites
<b>Total New Camping</b>	<b>0 sites</b>	<b>210 sites</b>	
<b>Total Camping in Corridor</b>	<b>565 sites</b>	<b>726 sites</b>	

### *Lodging*

In-park lodging availability would be increased by a minimal amount compared to existing conditions. Management actions related to lodging would focus on removing lodging from the ordinary high-water mark at Housekeeping Camp, and slightly reducing lodging in Wilderness. Tent cabins in the Boys Town area would be replaced with hard-sided units. As a result of these actions, the in-park lodging inventory would be increased from 1,160 units to 1,168 units. Table 8-39 provides a summary of the proposed changes to lodging and the reasons for those proposed changes.

**TABLE 8-39: LODGING FACILITIES- ALTERNATIVE 5**

<b>Wilderness</b>	<b>Alt 1 (No Action)</b>	<b>Alt 5</b>	<b>Details</b>
Merced Lake High Sierra Camp	22 units (60 beds)	11 units (42 beds)	18 beds removed from Wilderness lodging facility
<b>Yosemite Valley</b>	<b>Alt 1</b>	<b>Alt 5</b>	<b>Details</b>
Ahwahnee Hotel	123 rooms	123 rooms	No change at this National Historic Landmark
Housekeeping Camp	266 tent cabins	232 tent cabins	Remove 34 units out of the ordinary high-water mark (bed and banks of the river)
Curry Village	400 units	453 units (290 tents and 163 hard-sided units)	<ul style="list-style-type: none"> <li>Retain 290 tents</li> <li>Retain 18 units at Stoneman House</li> <li>Retain 47 cabin-with-bath units.</li> <li>Construct 98 hard-sided units in Boys Town</li> </ul>
Yosemite Lodge	245 rooms	245 rooms	No changes at lodging facility
<b>Wawona</b>	<b>Alt 1</b>	<b>Alt 5</b>	<b>Details</b>
Wawona Hotel	104 rooms	104 rooms	No change at this National Historic Landmark
<b>Total Lodging in Corridor</b>	<b>1,160 units</b>	<b>1,168 units</b>	
<b>* El Portal:</b> Private accommodations exist but are not on NPS land; therefore, they are not listed here.			



## Visitor Day Use Capacity and Access Improvements

Day-use parking capacity in Yosemite Valley would be expanded by 5% to meet current peak use levels. The total number of day-use parking spaces available across all segments in Alternative 5 is shown in Table 8-40. If day-use parking demand continued to increase in the future, additional proactive management actions would be implemented.

**TABLE 8-40: NUMBER OF DAY-USE PARKING SPACES IN SEGMENTS – ALTERNATIVE 5**

Location	Alt 1 (No Action)	Alt 5
Segment 2:Yosemite Valley	2,337 spaces	2,448 spaces
Segment 3:The Gorge	180 spaces	180 spaces
Segment 4:El Portal	214 spaces	414 spaces*
Segment 7: Wawona	290 spaces	290 spaces
Total Parking	3,021 spaces	3,482 spaces
*The 200 new spaces in El Portal are located in the Abbieville Remote Parking area. While these spaces are located in El Portal, most of the use associated with these spaces would occur in Yosemite Valley.		

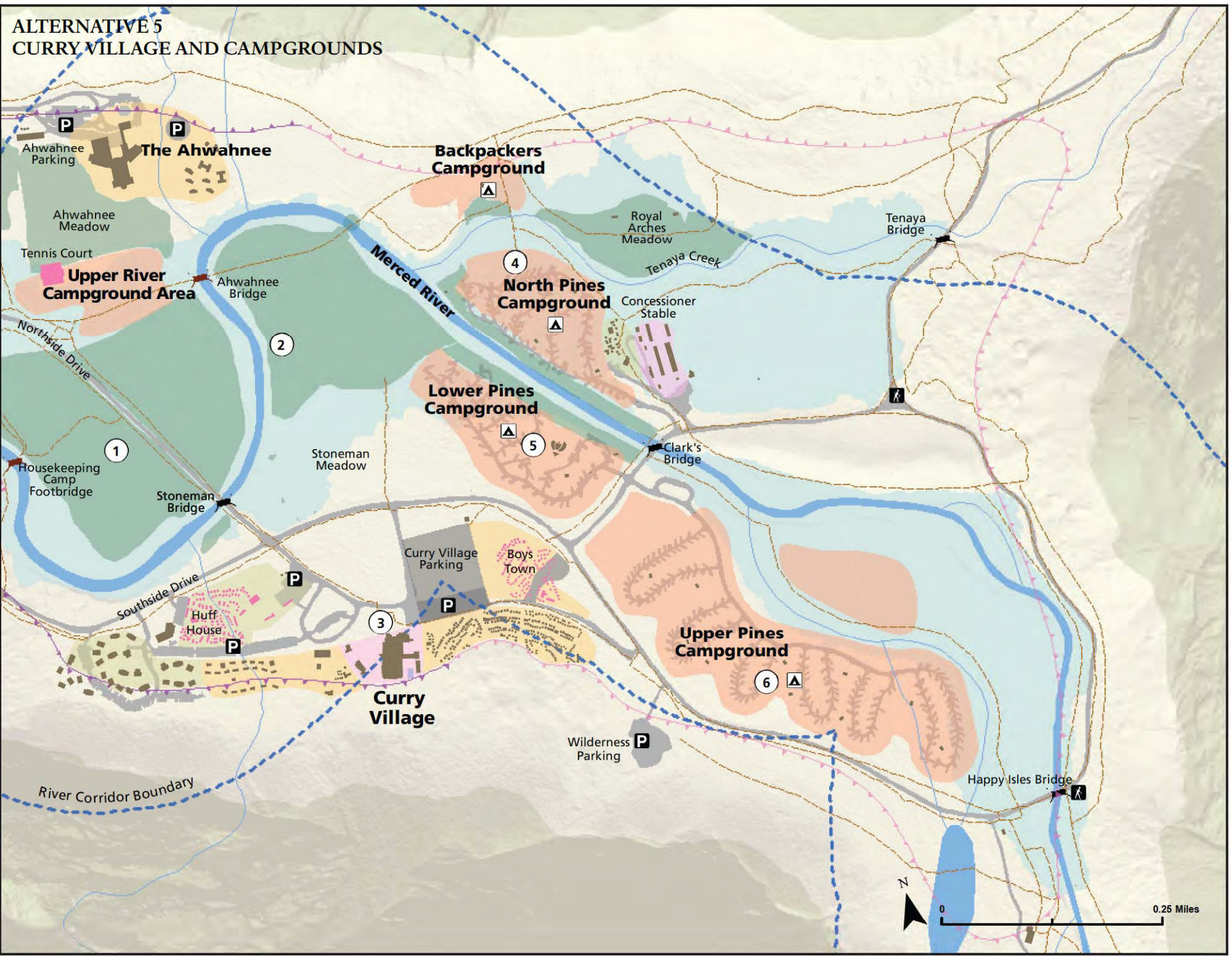
The most significant changes to parking and circulation would take place in the vicinity of the Yosemite Village Day-use Parking Area, at Yosemite Lodge, in the West Valley, and at El Portal. The Yosemite Village parking area would be redesigned with a total of 850 parking spaces. A new day-use parking area with a total of 300 parking spaces would be constructed west of Yosemite Lodge. Overflow parking during times of peak visitation would be provided in West Yosemite Valley (100 parking spaces) and in El Portal at Abbieville (200 parking spaces). Total parking for East Yosemite Valley (including day, overnight and administrative uses) would be approximately 5,300.

Regional transit options would also be expanded in this alternative, and the service frequency of Valley shuttle services would be reduced (see the detailed descriptions for Segment 2, below).

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# ALTERNATIVE 5: ENHANCED VISITOR EXPERIENCES AND ESSENTIAL RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: CURRY VILLAGE AND CAMPGROUNDS

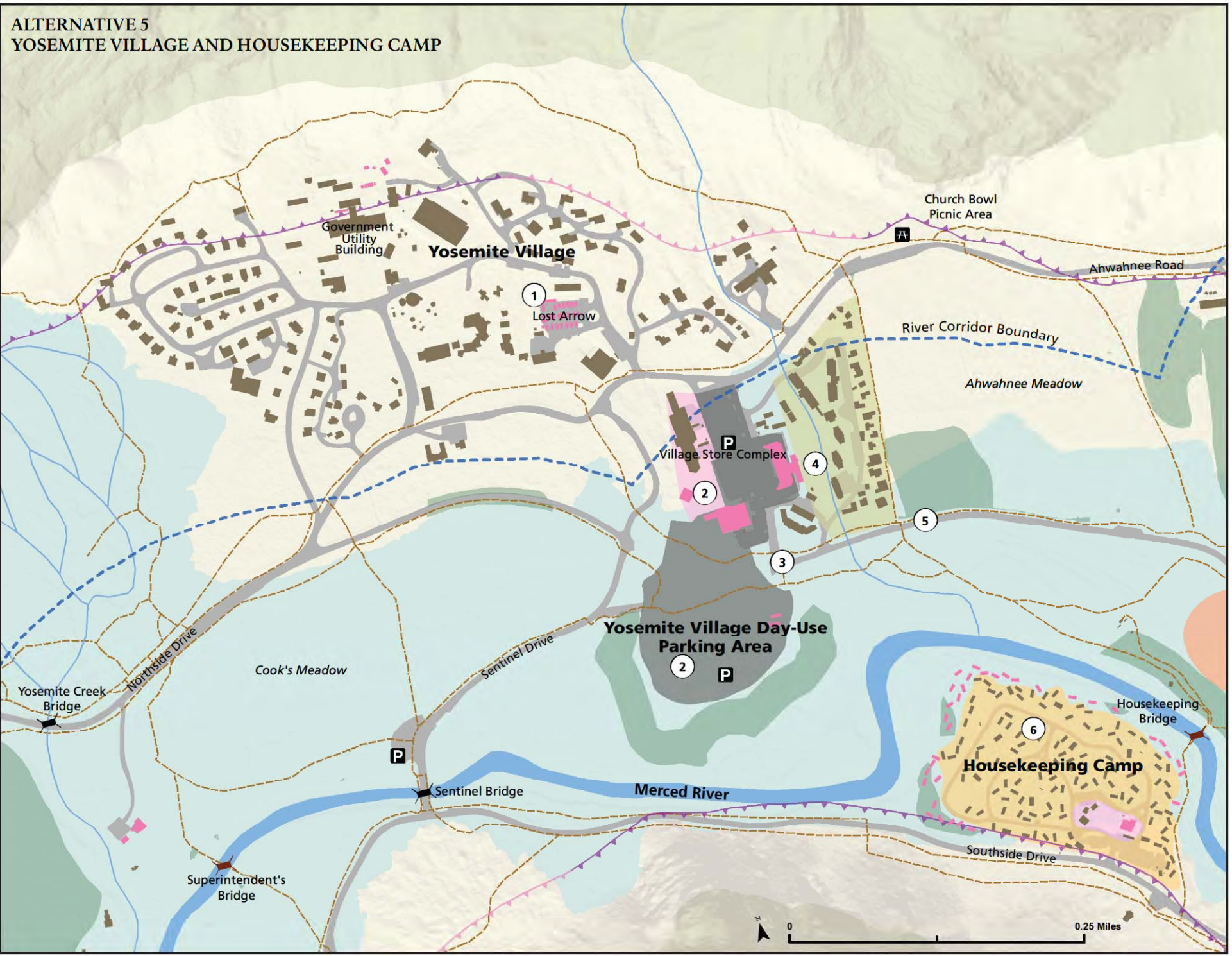
- Former Upper and Lower River Campground**
  - Former Lower River Campground: Ecologically restore to natural conditions. Provide picnic tables and parking for day use and directed river access to the Housekeeping Camp eastern beach.
  - New Upper River Campground: Construct a new campground out of the 25-year floodplain with 30 walk-in sites. Restore hydrologic processes in the southeast portion of the area.
  - Restoration: Restore 35.6 acres of floodplain. Protect the riverbank from trampling by fencing sensitive areas.
- River Reach Between Bridges**
  - Ahwahnee and Sugar Pine Bridges: Retain Ahwahnee Bridge. Remove the Sugar Pine Bridge to enhance free-flowing condition of the river. Re-route the multiple-use trail to the north bank of the river. Add another trail from the end of Ahwahnee Bridge toward Lower Pines Campground. Construct a new bridge to span the cutoff channel.
  - Stoneman Bridge: Mitigate effects of bridge to free-flowing condition through engineered solutions: place large wood to lessen scouring, and use brushlayering, a constructed log jam, and culverts along Northside Drive.
- Curry Village Area**
  - Lodging: Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.
  - Curry Orchard Parking Area: Provide 430 parking spaces through a re-design of the parking area that incorporates best management practices to protect water quality. Also, apply engineering solutions to promote water flow and to increase drainage to Stoneman Meadow. Remove apple trees to mitigate human-bear interactions and plant native vegetation.
- North Pines Campground Area**
  - Ecological Restoration at Campgrounds: Remove campsites within 100 feet of the river at North Pines, Backpackers and Lower Pines campgrounds. Restore 6.5 acres of riparian habitat. Designate a formal river access point at North Pines campground.
  - Backpackers Campground: Retain 10 walk-in sites. Remove 15 walk-in sites within the 100-foot riparian buffer to be replaced by 16 walk-in sites west of Backpackers Campground.
  - North Pines Campground: Retain 72 campsites. Remove 14 sites from within 100 feet of river.
  - Concessioner Stables in Yosemite Valley: Retain stables to support the operation of the Merced Lake High Sierra Camp. Provide overflow parking for campgrounds at the stables. Retain kennel service. Retain associated housing (25 beds).
- Lower Pines Campground Area**
  - Campground Sites: Retain 71 campsites and remove five sites from within 100 feet of river.
- Upper Pines Campground Area**
  - Campground Sites: Retain 238 campsites. Remove two sites for sensitive resource concerns.
  - New RV Loop: Construct a new campground loop with 36 RV sites.
  - New Walk-in Sites: Construct a new walk-in campground with 49 sites and two group camping sites.



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# ALTERNATIVE 5: ENHANCED VISITOR EXPERIENCES AND ESSENTIAL RIVERBANK RESTORATION



**EAST YOSEMITE VALLEY: YOSEMITE VILLAGE AND HOUSEKEEPING CAMP**

1. Lost Arrow: Replace temporary employee housing with permanent housing units for 50 beds.
2. Yosemite Village Day-use Parking Area: Move the Yosemite Village Day-use Parking Area northward 150 feet away from the river to facilitate riparian restoration goals. Using best management practices to protect water quality, formalize the parking area to have a total of 850 parking places by redeveloping part of the current administrative footprint as parking.
3. Pedestrian/Vehicle Conflicts: Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area and construct a traffic circle at Northside Drive and Village Drive to address traffic congestion and pedestrian vehicle conflicts. Re-routing the road south of the parking area is a traffic circulation pattern that will not require an underpass or pedestrian road crossings. Consolidate parking to the north of the road and provide walkways leading to Yosemite Village separating vehicle and pedestrian traffic. Add a three-way intersection at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion.
4. Concessioner Employee Housing: Create a 50-foot setback from Indian Creek. Ecologically restore the riparian habitat, and protect using restoration fencing. Retain Ahwahnee Row and Tecoya employee housing.
5. Ahwahnee Meadow Restoration: Retain Northside Drive and bike path but increase culverts to improve hydrologic connectivity. Replace 350 feet of trail with a boardwalk to protect wetlands.
6. Housekeeping Camp Lodging: Retain 232 lodging units, and remove 34 lodging units out of the bed and banks. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.

**Legend**

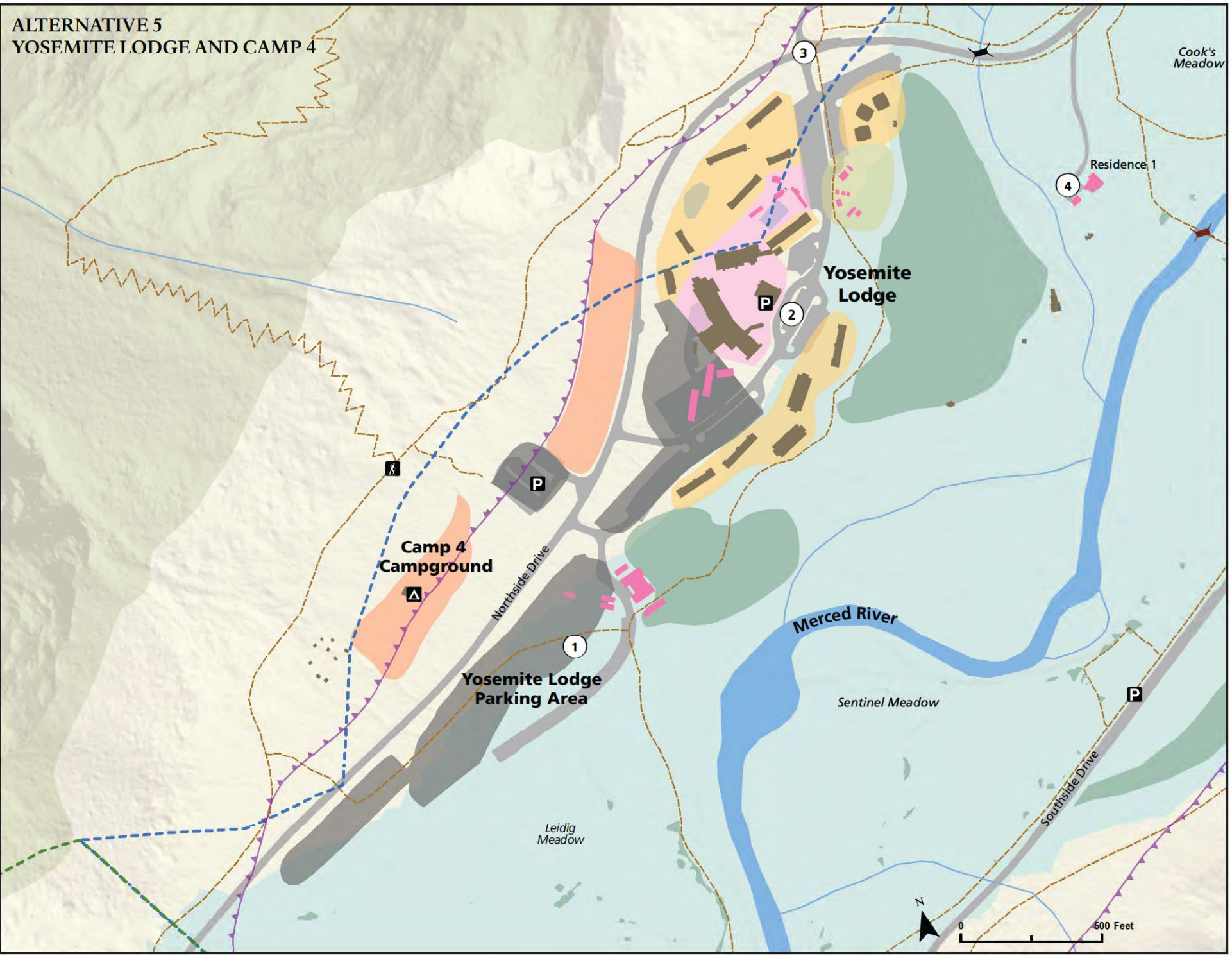
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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# ALTERNATIVE 5: ENHANCED VISITOR EXPERIENCES AND ESSENTIAL RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE LODGE AND CAMP 4

- 1. West of Yosemite Lodge**
  - **Parking:** Redevelop area southwest of Yosemite Lodge to provide an additional 300 day-use parking spaces. This will include 15 spaces for tour bus parking. Parking redevelopment will incorporate best management practices to protect water quality.
- 2. Yosemite Lodge**
  - **Ecological restoration:** restore riparian and floodplain ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate one service road to the well house and parking. Remove non-native fill, decompact soils, and plant riparian plant species (10.9 acres).
  - **Lodging:** Retain the current 245 units at Yosemite Lodge.
  - **Services and Facilities:** Retain Yosemite Lodge Food Court and Mountain Room bar and dining service. Re-purpose convenience shop and nature shop. Relocate Yosemite Lodge maintenance. Remove Yosemite Lodge post office, swimming pool, bike rentals, snack stand, employee housing (called Thousands Cabins), Highland Court employee temporary housing, and the NPS Volunteer Office.
  - **Tour Buses:** Remove temporary housing complex at Highland Court and establish a tour bus drop-off area with three bus loading spaces.
  - **Concessioner Housing:** Construct two new concessioner housing areas for 104 employees and construct 78 employee parking spaces. (Common to all alternatives is to remove housing at Highland Court and at the Thousands Cabins.)
- 3. Yosemite Falls Intersection**
  - **Traffic Congestion:** Construct a pedestrian underpass to alleviate pedestrian/vehicle conflicts and associated traffic congestion at the intersection of Northside Drive and Yosemite Lodge Drive.
- 4. Residence 1**
  - **Residence 1:** Relocate Residence 1 (the Superintendent's House) to the NPS housing area and rehabilitate the building per the Secretary of Interior's Standards for the Treatment of Historic Properties and the Historic Structures Report. Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.

**Legend**

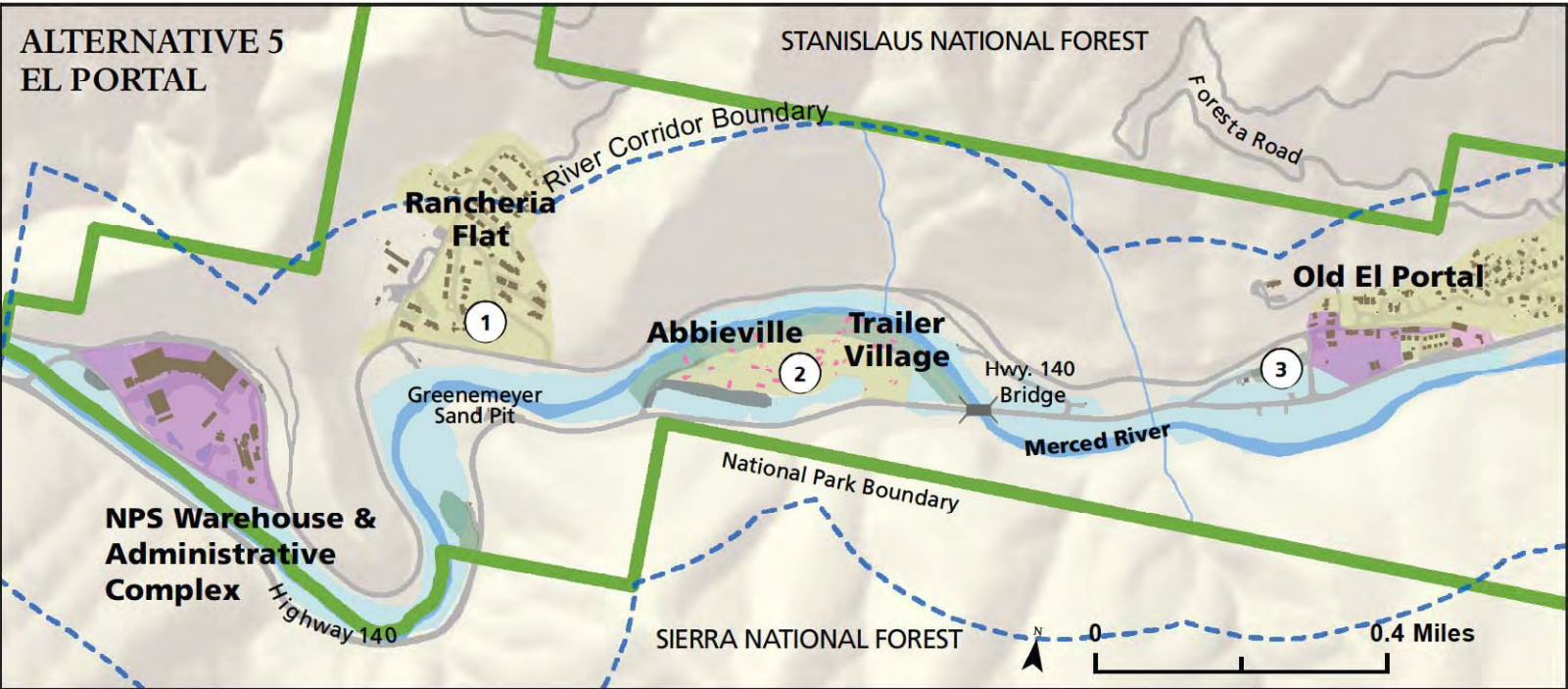
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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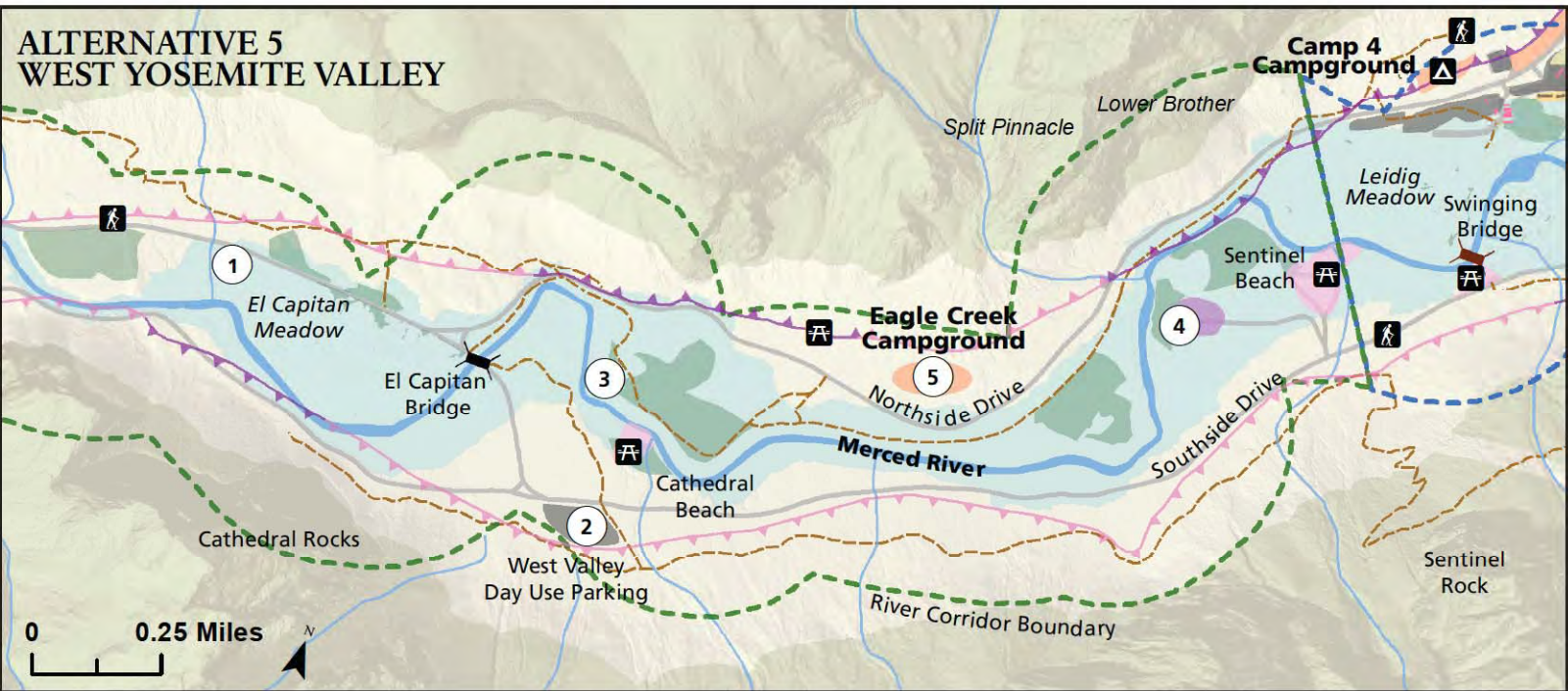


# ALTERNATIVE 5: ENHANCED VISITOR EXPERIENCES AND ESSENTIAL RIVERBANK RESTORATION



## EL PORTAL

- 1. Rancheria Flat**
  - Employee Housing: To replace temporary housing that will be removed from Yosemite Valley, construct seven dormitories, with 12 employees each, for a total of 84 employee beds, away from sensitive resources.
- 2. Abbieville and Trailer Village Area**
  - El Portal Remote Visitor Parking: Construct a new visitor parking area for 200 spaces serviced by regional transit. Parking redevelopment will incorporate best management practices to protect water quality.
  - Abbieville and Trailer Village Housing: Remove or relocate 36 existing private residences. Continue to provide for housing land use for 40 employees and volunteers at this location. As homes within the 150-foot riparian buffer become vacant, ecologically restore these areas.
- 3. El Portal Village Center**
  - Valley Oak Restoration: Restore the rare floodplain community of valley oaks in Old El Portal through implementation of best management practices. Create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.
  - Odger's Fuel Storage Facility: Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompact soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.



## WEST YOSEMITE VALLEY

- 1. El Capitan Meadow Area**
  - Restoration of Informal Trails: Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing along northern perimeter of meadow and designate appropriate access points using boardwalks and viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside.
- 2. West Valley Overflow Parking**
  - Day-Use Parking: Construct a new 100-space West Valley Overflow Parking Area on the south side of Southside Drive at the intersection of El Capitan Crossover. Parking development will incorporate best management practices to protect water quality. Expand shuttle service to serve West Valley locations.
- 3. Valley Loop Trail**
  - Re-Route: Move portions of the Valley Loop Trail out of sensitive areas; this includes the 780 feet of the trail through Bridalveil Meadow. Construct boardwalks through wet meadow habitat in Slaughterhouse Meadow.
- 4. Yellow Pine Campground**
  - Administrative Use Campground: Retain Yellow Pine's four group sites (serving up to 120 people) for administrative use.
- 5. Eagle Creek Campground**
  - New Campground: Construct campground with 40 car campsites and 2 group campsites east of El Capitan Picnic Area.

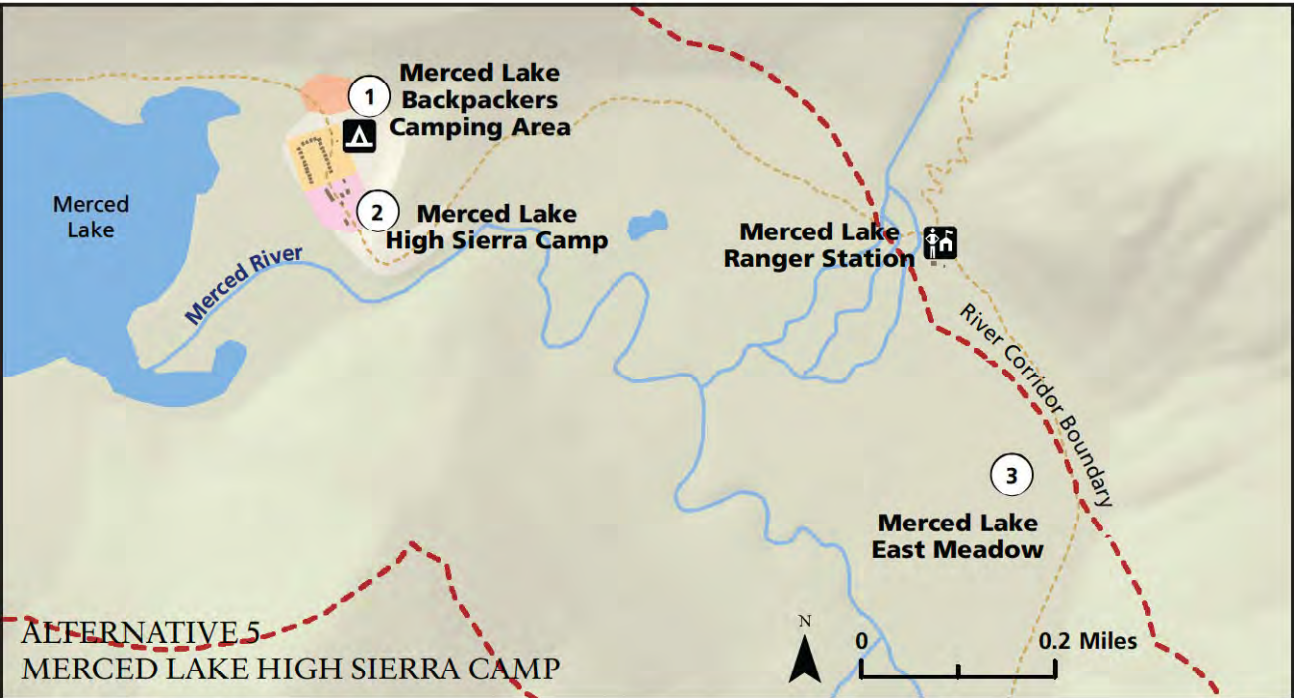
## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		



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# ALTERNATIVE 5: ENHANCED VISITOR EXPERIENCES AND ESSENTIAL RIVERBANK RESTORATION

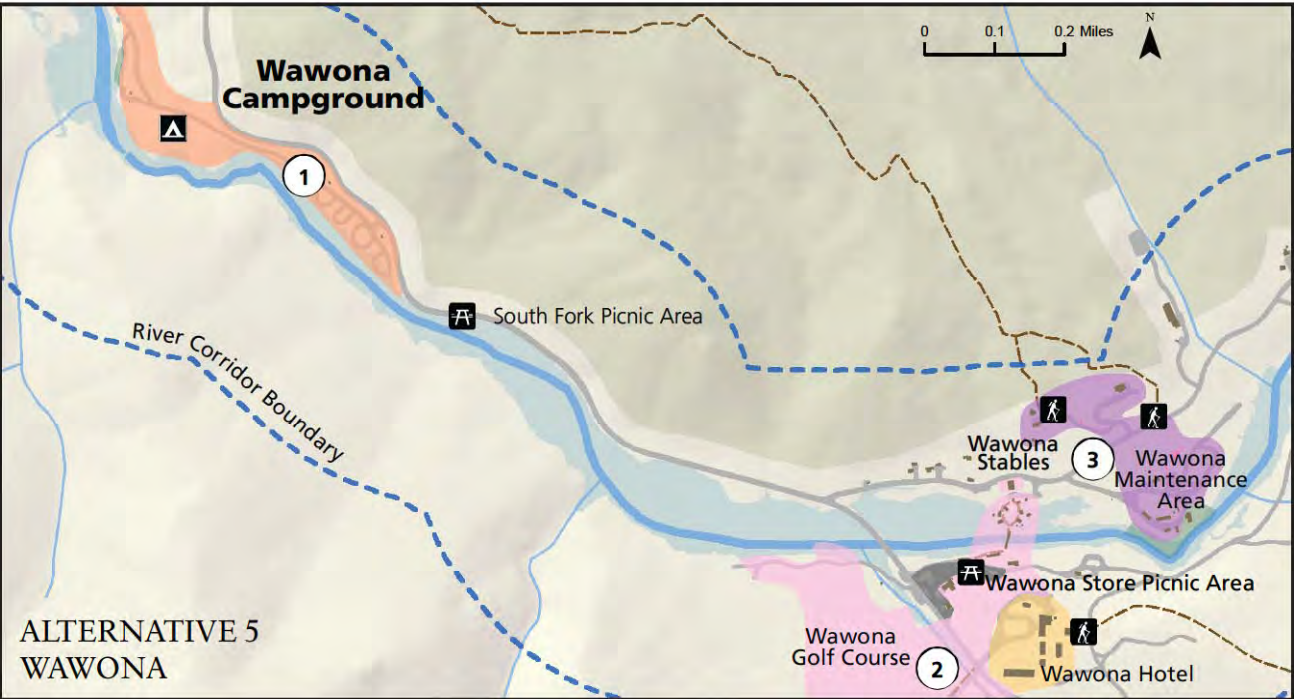


## MERCED LAKE HIGH SIERRA CAMP

1. Merced Lake Backpackers Camping Area: Retain the designated camping area. Replace flush toilets with composting toilets.
2. Merced Lake High Sierra Camp: Retain 11 units (42 beds) at this lodging facility. Replace flush toilet with composting toilets.
3. Merced Lake East Meadow: Develop preliminary grazing capacities for the meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed to protect the meadow.

## OTHER SEGMENT 1 CAMPING AREAS

- Little Yosemite Valley: Continue designated camping in this camping area. Retain infrastructure, such as composting toilets.
- Moraine Dome: Continue designated camping in this camping area.



## WAWONA

1. The Wawona Campground: Retain 83 sites and one group site. Remove 13 sites that are either within 100 feet of the river or in culturally sensitive areas.
2. Wawona Golf Course and Golf Shop: Retain nine-hole golf course and retail and food service at golf shop.
3. Wawona Stables Area and Maintenance Yard
  - Stables Operation: Retain stables and commercial day rides.
  - Stock-Use: Campsites: Relocate two stock-use campground sites away from sensitive resource areas to an appropriate location within the Wawona Maintenance Yard area.

## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		

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## **Detailed Description of Alternative 5 by Segment**

### ***Segment 1: Wilderness above Nevada Falls (Wild Segment)***

#### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 5 would include the following action to protect and enhance river values:

##### ***Biological Values***

- Establish preliminary grazing capacities for Merced Lake East Meadow; monitor, and adapt as necessary.

##### ***Recreational Values***

- Reduce the capacity of the Merced Lake High Sierra Camp by 11 tents, and reduce the visual contrast of the camp at the time that tents need replacement.
- Continue to concentrate visitor use at Little Yosemite Valley and Merced Lake by retaining designated camping areas in these zones.

#### **User Capacity, Land Use and Facilities Management**

Alternative 5 would accommodate generally the same kinds and amounts of use that exist today in this segment. In addition to the “Actions Common to Alternatives 2-6” (page 8-77), Alternative 5 would include the following actions to manage user capacity, land use, and facilities:

##### ***Visitor Activities and Services***

Overnight users would stay at the Merced Lake High Sierra Camp or backpack (staying overnight at designated camping areas or dispersed throughout the wilderness).

Private boating would be allowed in Segment 1. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Only 10 boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

Up to two overnight commercial groups would be allowed per Wilderness zone in Segment 1.

##### ***Visitor Overnight Capacity***

All zone capacities would remain the same (Table 8-41). Services would be managed as follows:

- Retain the Merced Lake Backpackers Camping Area; replace flush toilets with composting toilets.
- Retain the Merced Lake High Sierra Camp at a reduced capacity of 42 beds; replace flush toilets with composting toilets.
- Retain designated camping areas at Little Yosemite Valley and Moraine Dome.

**TABLE 8-41: WILDERNESS ZONE CAPACITIES FOR ALTERNATIVE 5**

Wilderness Zones	Alt 5 Zonewide Capacity	Alt 5 Zone Capacity Specific to the River Corridor
Little Yosemite Valley Zone	<b>150</b> people	<b>150</b> people
Merced Lake Zone	<b>50</b>	<b>50</b>
Washburn Lake Zone	<b>150</b>	<b>100</b>
Mount Lyell Zone	<b>50</b>	<b>10</b>
Clark Range Zone	<b>50</b>	<b>10</b>

### *Visitor Day-use Parking Capacity*

Day use access to this segment is addressed under “Actions Common to Alternatives 2-6” (beginning on page 8-53.)

### *Administrative Activities*

- Continue current administrative activities, which consist primarily of regular ranger patrols and backcountry utility work as well as occasional trail/restoration crews. These activities are seasonal and minimal in comparison to visitor use and would not affect overall user capacity.

## *Segment 2: Yosemite Valley (Recreational and Scenic Segments)*

### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 5 would include the following action to protect and enhance river values:

#### *Free Flow*

- Retain Stoneman Bridge; mitigate the hydrological effects of the bridge by placing large wood on the riverbanks to address scouring, adding brush layering, and increasing channel complexity between Clarks Bridge and Sentinel Bridge (as described in Chapter 5 and Appendix E).
- Remove the Sugar Pine Bridge and berm connecting it to the Ahwahnee Bridge; reroute the multi-use trail along the north bank of the river.
- Retain the Ahwahnee Bridge; mitigate the hydrological effects of the bridge by placing large wood on the riverbanks to address scouring, adding brush layering, and increasing channel complexity between Clarks Bridge and Sentinel Bridge (as described in Chapter 5 and Appendix E). Construct a multi-use trail from the end of the Ahwahnee Bridge to connect to the Lower Pines area.

#### *Water Quality*

- Reroute the pack stock trail from the Concessioner Stable farther north, adjacent to the Happy Isles Loop Road.

#### *Biological Values*

Alternative 5 would remove existing campsites within 100 feet of the ordinary high-water mark:

- Remove all existing campsites and associated infrastructure within 100 feet of the ordinary high-water mark and restore natural floodplain and riparian habitat (12 acres).

- **Backpackers Camp:** Remove 15 sites within 100 feet of the ordinary high-water mark. (Replace all these sites to the west of the current campground.)
- **North Pines Campground:** Remove 14 campsites from within 100 feet of the ordinary high-water mark ; restore native riparian vegetation
- **Lower Pine Campground:** Remove 5 sites from within 100 feet of the ordinary high-water mark; restore native riparian vegetation.
- **Upper Pine Campground:** Retain 238 campsites, 22 of which are in the 100-year floodplain.
- **Former Lower and Upper River Campgrounds:** Remove abandoned facilities within the 10-year floodplain and restore 35.6 acres of natural floodplain topography and riparian/wetland habitat; reestablish overflow channels where possible. Fence and close the riparian zone at former Upper River to protect the riverbank from trampling; direct visitors to access the river for boating and swimming by way of a path to the Housekeeping Camp eastern beach.
- **Yosemite Lodge:** Retain all lodging at Yosemite Lodge, including four structures within the 100-year floodplain
- **Former Pine and Oak Units:** Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were removed after the 1997 flood) and wellness center while maintaining access to the well house.
- **Yosemite Village:** Move the Yosemite Village Day-use Parking Area northward so that it is 150 feet back from the ordinary high-water of the Merced River and outside a designated 50-foot setback from Indian Creek; remove fill material and restore the riparian habitat adjacent to the river.
- **Housekeeping Camp:** Remove lodging and other facilities at Housekeeping Camp out of the ordinary high-water mark (remove 34 units); restore native riparian habitat (1 acre). Direct visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge; fence off the current eastern river access point located on a steep eroded bank, and actively restore the riverbank with brush layering.

Alternative 5 would remove or mitigate the effects of trails and roads through meadows:

- **Bridalveil Meadow:** Reroute the 780-foot segment of the Valley Loop Trail that currently crosses Bridalveil Meadow so that it is adjacent to Southside Drive.
- **Slaughterhouse Meadow:** Construct boardwalks through sensitive wet meadow habitat at Slaughterhouse Meadow.
- **El Capitan Meadow:** Fence the northern perimeter of the meadow to protect the restoration area, and designate appropriate access points using boardwalks and viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside to discourage foot traffic into the meadow.
- **Ahwahnee Meadow:** Retain Northside Drive and bike path in current configuration; add culverts to improve hydrologic connectivity through Ahwahnee Meadow. Install a boardwalk to traverse wet areas through Ahwahnee Meadow (350 feet long).
- **Stoneman Meadow:** Retain Southside Drive through Stoneman Meadow; conduct transportation and engineering studies to examine the impact of removing this road segment, given the traffic volumes and patterns associated with this alternative. Expand the fenced area on the north end of the meadow near Lower Pines Campground to protect wetlands. Remove roadside parking along Stoneman Meadow to discourage foot traffic into the meadow.

*Cultural Values*

- Remove two structures from the collective sites representing the prominent historic patterns of development in Yosemite Valley: Sugar Pine Bridge and Residence 1.
- Relocate Residence 1 to the NPS housing area and at a minimum stabilize the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995).

*Recreational Values*

- Restrict boating to 100 people per day using private vessels only and to specific stretches of river in Yosemite Valley. This reduction in boats would enhance dispersed recreation along the river corridor.
- Mitigate traffic congestion in East Yosemite Valley through intentional traffic management as well as the addition of remote parking lots with bus and shuttle access to Yosemite Valley destinations.

**User Capacity, Land Use and Facilities Management***Visitor Activities and Services*

Alternative 5 would generally continue the kinds and amounts of use in Yosemite Valley that exist today, with improvements in the types and ease of access provided to visitors. It would include the following changes in visitor activities and services in addition to those common to Alternatives 2-6 (page 8-77):

- Allow only private boating in this river segment, and expand private boating access to a longer section of the river in the Valley. Private boaters would be allowed between Lower River Campground and Sentinel Beach/Yellow Pine. The put-ins and take-outs for this river segment would be located at the Lower River Day-use Area and Sentinel Beach. A maximum of 100 permits per day would be issued for private boaters in this river segment.
- Expand picnicking and day-use opportunities at Yosemite Village, Church Bowl, and Happy Isles.
- Provide a new picnic area (8 tables and 20 parking spaces) and designated river access for rafting in the Lower River area.
- Retain the Housekeeping Camp shower houses, restrooms, and laundry; remove the grocery store.
- Retain Concessioner Stables in Yosemite Valley to support Merced Lake High Sierra Camp and overflow parking for campgrounds. Eliminate commercial day horseback rides from Yosemite Valley. Kennel service remains.
- Remove the Curry Village raft rental.

*Visitor Overnight Capacity: Camping*

Camping would be increased to 640 sites accommodating 4,032 people per night:

- **Backpackers Camp:** Retain 10 walk-in sites. Remove 15 sites within 100 feet of the ordinary high-water mark. Construct 16 new walk-in campsites west of Backpackers Camp.
- **Former Upper River Campground:** Construct a new campground with 30 walk-in sites, north of the river outside the 25-year floodplain. Restore hydrologic processes in the southeast portion of the former campground area.
- **North Pines Campground:** Retain 72 campsites. Remove 14 sites from within 100 feet of the ordinary high-water mark.

- **Upper Pines Campground:** Retain 238 campsites. Construct a new recreational vehicle campground loop with 36 RV sites. Construct a new walk-in campground with 49 individual sites and 2 group sites.
- **Lower Pines Campground:** Retain 71 campsites. Remove 5 sites from within 100' of the ordinary high-water mark.
- **Camp 4:** Retain 35 walk-in campsites and 35 parking spaces. Construct 35 additional campsites east of Camp 4; establish a new parking area (41 spaces) for the Camp 4 campground expansion in the disturbed footprint of the former service station near Camp 4.
- **Eagle Creek:** Construct a new campground with 40 drive-in sites and 2 group sites.

### ***Visitor Overnight Capacity: Lodging***

Lodging would be slightly increased to 1,053 units accommodating 3,697 people per night. Common to Alternatives 2-6, The Ahwahnee would continue to provide 123 lodging rooms. The following additional lodging would be retained, removed, or constructed under Alternative 5:

- **Curry Village:** Retain 355 lodging units: 290 tents, 18 units at Stoneman House, 47 hard-sided cabins with bath. Remove all existing cabins and associated structures at Boys Town. Construct 98 new lodging units suitable for year-round use (25 duplex buildings, two 4-plex buildings, and five two-story 8-plex buildings, all with private baths); construct a new guest check-in building and pedestrian pathway; provide 78 new parking spaces along the existing roadway and 20 new parking spaces along the eastern edge of the orchard parking lot, all within the existing developed footprint. Provide 450 designated overnight parking spaces at Curry Orchard.
- **Housekeeping Camp:** Retain 232 units and associated facilities. Remove 34 units out of the ordinary high water mark defined by the Army Corps of Engineers.
- **Yosemite Lodge:** Retain 245 lodging units and associated services and facilities (food service, parking).

Conceptual site drawings for lodging improvements at Boys Town under Alternative 5 have been completed to allow the analysis of impacts of this potential project. See "Conceptual Site Drawings" at the end of the Alternative 5 discussion for site details and design drawings.

### ***Visitor Day-use Parking Capacity, Transit Options, and Circulation***

Alternative 5 would increase the maximum daily visitation in Yosemite Valley. The day parking, regional transit, and tour bus capacities would accommodate up to 8,954 day users at one time in Segment 2:

- Increase available day-use parking spaces (+ 111 spaces) for a total of 2,448 parking spaces, accommodating a maximum of 6,389 people at one time.
- Accommodate an estimated 1,160 people at one time in circulation on Valley roads.
- Accommodate a maximum of 684 people at one time arriving to the Valley on regional transit.
- Retain tour bus parking at 15 spaces, accommodating up to 720 people at one time.

Visitor circulation would be improved to reduce traffic congestion and to provide a better arrival experience for visitors. Major actions would include the following:

## ALTERNATIVES

- Redesign day parking at Yosemite Village to provide 850 designated spaces and a new comfort station.
- Construct a new parking lot and a comfort station, providing 300 parking spaces for day visitors and 15 spaces for tour buses, west of Yosemite Lodge.
- Construct a new parking lot to accommodate overflow parking for 100 vehicles south of Southside Drive; expand Yosemite Valley shuttle service to West Valley.

Conceptual site drawings for the Yosemite Village Day-use Parking Area and the new parking lot west of Yosemite Lodge under Alternative 5 have been completed to allow the analysis of impacts of these potential projects. See "Conceptual Site Drawings" at the end of the Alternative 5 discussion for site details and design drawings.

Day users would also be able to access the Valley by parking in the new El Portal remote parking area (200 parking spaces) and taking a shuttle to the Valley.

An East Yosemite Valley day-use parking permit system would be implemented if conditions reached the point where day use visitation to the East Yosemite Valley from private vehicles exceeded the parking availability, and formal traffic diversions at El Capitan Crossover were instituted for 14 days or more during the summer season for 2 consecutive years (see Chapter 5).

Regional transit services into Yosemite Valley during the peak summer season would be expanded to accommodate a maximum of 684 people at one time in Yosemite Valley.

- Highway 140 (Merced to Yosemite Valley): Maintain service at 12 runs per day. Add a stop at the El Portal remote day-use parking area.
- Highway 41 between Fresno and Yosemite Valley: Implement new public transit service at 12 runs/day.
- Implement a dedicated shuttle to Badger Pass for transfer shuttle to Glacier Point.
- Highway 120 West (Groveland to Yosemite Valley): Reduce service to 4 runs per day (summer only).
- Highway 120 East (Mammoth Lakes to Yosemite Valley): Maintain service at 2 runs per day (summer only)

Under all the action alternatives, including Alternative 2, shuttle bus service would be improved by increasing the frequency of the year-round East Valley service to 5 minute intervals during peak use. The Visitor Center Express shuttle service (summer only) would be improved by increasing the frequency to 7 minute intervals between buses. Shuttle service would be expanded as follows:

- Expand Valley Shuttle service to Bridalveil (summer only) with 60-minute interval between buses and stops at El Capitan picnic area, El Capitan Meadow, Bridalveil Fall straight, Cathedral Beach, Yellow Pine, and Four-mile/Swinging Bridge.

### *Administrative Activities*

Some administrative activities would be relocated:

- Relocate the Yosemite Lodge housekeeping and maintenance facilities to a location behind the Yosemite Lodge cafeteria.



**TABLE 8-42: TRANSIT OPTIONS- ALTERNATIVE 5**

Regional Transit Options	
HWY 140 Merced/Mariposa to Yosemite Valley	12 runs per day Additional stop at the El Portal remote day-use parking area (year round)
HWY 41 Fresno/Oakhurst to Yosemite Valley	12 runs per day Dedicated shuttle to Badger Pass as collection point for shuttle to Glacier Point
HWY 120 West Groveland/Sonora to Yosemite Valley	4 runs per day (summer only)
HWY 120 East Inyo/Mono County (Mammoth Lakes) to Yosemite Valley	2 runs per day (summer only)
Yosemite Valley Shuttle Options	
East Yosemite Valley	5 minute peak interval between buses Year round except Visitor Center direct
Visitor Center Express Yosemite Valley Day-use Parking Area to Visitor Center	7 minute interval between buses (summer only)
El Capitan Crossover	30 minute interval between buses (summer only)
West Yosemite Valley	Expand Valley Shuttle service to Bridalveil (summer only) 60-minute interval between buses Stops at El Capitan picnic area, El Capitan Meadow, Bridalveil Fall straight, Cathedral Beach, Yellow Pine, and Four-mile/Swinging Bridge

### ***Employee Housing and Employee Parking***

Compared to existing conditions, 179 fewer concessioner employees would be housed in Yosemite Valley. The remaining housing for 972 concessioner employees would be provided as follows:

- Retain housing for 42 employees at The Ahwahnee Hotel.
- Provide housing for 436 employees at Curry Village.
  - Retain permanent housing in the Curry Village residential area (223 employees).
  - Retain housing at Concessioner Stable (49 employees).
  - Construct 16 buildings housing 164 employees.
- Provide housing for 390 employees at Yosemite Village:
  - Retain permanent housing at Indian Creek, Lost Arrow, and Upper Tecoya (65 employees).
  - Retain Ahwahnee Row, Y Apartments, garage housing, and Hospital Row (43 employees).
  - Retain Tecoya Dorms (232 employees).
  - Construct new housing at Lost Arrow for 50 employees.
- Provide housing for 104 employees at Yosemite Lodge:
  - Construct new housing for 104 employees at Yosemite Lodge (two structures with 26 double-occupancy units each)

Four group administrative campsites (up to 120 people) would be retained at the Yellow Pine Administrative Campground.

An additional 96 Valley employees working in Yosemite Valley would be housed at El Portal.

### ***Segment 3: Merced Gorge (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 3 for Alternative 5 are included in the “Actions Common to Alternatives 2-6” (page 8-53).

#### **User Capacity, Land Use and Facilities Management**

This alternative would provide for similar kinds and amounts of use that exist today. The majority of actions for Alternative 5 in Segment 3 are discussed in the “Actions Common to Alternatives 2-6” (page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

#### ***Visitor Activities and Services***

Kayaking would not be allowed in this segment under this alternative due to the safety concerns associated with accessing the river for search and rescue operations during high use periods. This section of river is steep and rocky, and boatable only by the most advanced paddlers.

#### ***Transit Options***

Public transit options along this segment would be expanded as described in the Yosemite Valley segment (see Segment 2 above).

### ***Segment 4: El Portal (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (see page 8-53), Alternative 5 would protect and enhance biological values as follows:

#### ***Biological Values***

- **Abbieville and Trailer Village Housing-** The riverbanks at Abbieville and Trailer Village would be protected with a 150-foot riparian buffer measured from the ordinary high-water mark of the Merced River. Riparian habitat within the 150-foot buffer would be restored by removing unnecessary roads and parking, de-compacting soils, and planting with native riparian and oak woodland species.

#### **User Capacity, Land Use and Facilities Management**

The majority of actions for Segment 3 are discussed in the “Actions Common to Alternatives 2-6” (see page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

#### ***Visitor Activities and Services***

Alternative 5 would allow for unrestricted private boater use of the river in Segment 4. Boaters would be permitted below Yosemite View Lodge to beyond the Foresta Bridge (at which point boaters would exit the

segment). Boaters would be able to use put-ins and take-outs below the hotel, at the store/gas station and the Red Bud launch site.

### ***Visitor Overnight Use***

No visitor overnight accommodations on NPS lands are proposed in Alternative 5.

### ***Visitor Day-use Parking Capacity***

A new remote visitor day-use parking area accommodating a maximum of 200 vehicles would be provided at the Abbieville site. This parking area would primarily be used for visitor access to Yosemite Valley by way of the YARTS route on Highway 140. The visitor use capacity associated with this parking area is accounted for in the Yosemite Valley segment, though the physical parking spaces are located in El Portal.

The total available day-use parking capacity in this segment would be 414 spaces; 214 spaces for visitors to El Portal and 200 spaces for visitors to Yosemite Valley (or other Yosemite destinations).

### ***Transit Options***

As noted in the Yosemite Valley and Merced Gorge segment discussions above, public transit along the Highway 140 travel corridor would be expanded. Regional transit buses would stop at the new day-use parking area at Abbieville. Bus service would be provided on a 30-minute interval during peak use season and run directly to Yosemite Valley. For a complete summary of the transit option along this corridor, see the Segment 2 summary above.

### ***Administrative Activities***

All administrative activities in Segment 4 are considered in “Actions Common to Alternatives 2-6” (see page 8-53).

### ***Employee Housing Capacity***

In Alternative 5, high density employee housing would be added to the El Portal Village Center (12 beds) and a dormitory in Rancheria Flat (84 beds). All new units would be outside of the 100 year flood plain. These units would be added to accommodate for the units removed from Segment 2.

### ***Employee and Administrative Parking Capacity***

Most employee and administrative parking actions are discussed in “Actions Common to Alternatives 2-6” (page 8-53). Additionally, 84 spaces would be added with the Rancheria Dormitory and 12 spaces within the El Portal Village Center.

## ***Segment 5: South Fork Merced River Above Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions in Segment 5 in addition to what is proposed under “Actions Common to Alternatives 2-6” (page 8-53).

## **User Capacity, Land Use and Facilities Management**

Alternative 5 would provide for similar kinds and amounts of use that exist today in Segment 5. The majority of actions for Alternative 5 in Segment 5 are discussed in the “Actions Common to Alternatives 2-6” (page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in Segment 5. Generally, use would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Only 10 boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

### ***Transit Options***

Specific transportation options for reaching Segment 5 trailheads are listed below under Segment 7.

## ***Segments 6 and 7: Wawona and Wawona Impoundment (Recreational Segments)***

### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (see page 8-53), protection and enhancement of cultural values and water quality would be accomplished through the actions described below.

### ***Cultural Values***

- Wawona stock use campground – Two stock use campground sites would be relocated away from a culturally sensitive area to the Wawona Maintenance Yard area.

## **User Capacity, Land Use and Facilities Management**

Overall, Alternative 5 would provide for similar kinds and amounts of use that exist today in the Wawona area. The majority of actions for Alternative 5 in Segment 7 are discussed in the “Actions Common to Alternatives 2-6” (page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

A range of visitor recreation activities would continue to be available. River related activities would include swimming, fishing and boating and other activities common to Alternatives 2-6. In addition:

- Boating would be limited to private use only by permit with a maximum of 10 boats per day. The allowable reach of the river would be from below the Swinging Bridge area to the Park Boundary, excluding the Wawona impoundment.

### ***Visitor Overnight Use***

The total overnight capacity of the Wawona area would be 190 units accommodating up to 787 people per night under Alternative 5.

The Wawona Campground capacity would be reduced slightly to 84 sites (including one group site), accommodating 528 people per night (13 campsites are removed from within 100-feet of the ordinary high-water mark of the South Fork Merced River and other culturally sensitive areas).

The two campsites at the Wawona stock camp would be relocated and would accommodate 6 people per night each (12 people per night total).

### ***Transit Options***

Transit options would be expanded in Alternative 5. Regional bus service, similar to that provided on the Highway 140 corridor, would be introduced. A maximum of 12 runs per day would be made between Fresno and Yosemite Valley. Using 48-passenger buses this would accommodate a maximum of 311 people at one time. Additionally, the Wawona area shuttle would continue, serving the key destinations within this segment along with the Mariposa Grove of Giant Sequoias. Finally, up to two concessioner-operated runs per day would be made between Wawona and Yosemite Valley.

## ***Segment 8: South Fork Merced River Below Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions specific to Segment 8 in Alternative 5. For a list of actions common to all action alternatives in Segment 8, please see “Actions Common to Alternatives 2-6,” (page 8-53).

### **User Capacity, Land Use and Facilities Management**

Alternative 5 would provide for similar kinds and amounts of use that exist today in Segment 8; significant changes are not proposed. The majority of actions for Alternative 5 in Segment 8 are discussed in the “Actions Common to Alternatives 2-6” (page 8-77). Actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Only ten boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

### ***Transit Options***

Transit services for access to this segment are described above, under Segment 7.

## **Analysis of Facilities and Services**

Table 8-43 presents the park’s assessment of the particular facilities and services that would be needed to support public use and/or to protect river resources based on the types, levels, and locations of use proposed for Alternative 5. As an example, the goals of this alternative include enhanced visitor experiences and essential riverbank restoration. This alternative prescribes essential restoration within 100 feet of the Merced River and visitor use levels that are the same as current levels. There would be a moderate increase in camping and day-use parking opportunities, therefore additional camping would be provided at the Upper River and Eagle Creek Campgrounds, and additional overflow parking for East Yosemite Valley near El Capitan Crossover as well as expanded parking at the Yosemite Lodge area.

**TABLE 8-43: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 5**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 1: Wild</b>			
Merced Lake High Sierra Camp	Reduced	<b>Yes:</b> This facility offers rustic accommodations to visitors traveling independently or as a part of the organized High Sierra Loop Trip offered by the concessioner in cooperation with the NPS. The number of camp beds allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No:</b> The High Sierra Camp is outside designated Wilderness; however it is surrounded by designated wilderness. Designated wilderness precludes the construction of new facilities such as this. Alternatives in Chapter 8 consider various means of addressing impacts to ORVs.
Merced Lake Backpackers Camping Area	Retained	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to allow support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Little Yosemite Valley Camping Area	Retained	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Moraine Dome Camping Area	Retained	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
<b>Segment 2: Curry Village and Campgrounds</b>			
Upper Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Lower Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
North Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.



TABLE 8-43: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 5

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Backpackers Campground	Reduced (partially re-located)	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience. In addition, this campground provides is critical for backpackers who need to start or end their wilderness trip in Yosemite Valley.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Valley Campground Reservation Center	Retained	<b>Yes:</b> The Valley Campground Reservation Center is an essential National Park Service point-of-contact for campers, and those who seek campsites, in Yosemite Valley. The Campground Reservation Center staff sells campsite reservations for all campsites in the park available for reservations. The Reservation Center is operated on a year-round basis.	<b>Yes.</b> The Campground Reservation could be moved from its existing location. However, it is important to the successful delivery of services provided from the reservation center that any alternative location be near the Valley campgrounds.
Housekeeping Camp Lodging Units	Reduced	<b>Yes:</b> Housekeeping Camp offers rustic overnight guest accommodations for visitors who do not or are unable to camp. The number of units allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> No alternative areas of sufficient size to accommodate this lodging facility (adjacent to the river, which is an integral part of the overnight experience )are available for development in Yosemite Valley
Housekeeping Camp Laundry	Retained	<b>Yes:</b> The public laundromat at Housekeeping Camp is a small facility that supports visitor use. The nearest public laundry facilities outside the park are located 50 miles from Yosemite Valley. Visitors spending multiple nights in the park frequently need to launder their clothing, and, in some cases, sleeping bags, blankets or other outdoor items.	<b>No.</b> This service is provided for Housekeeping Camp guests and is directly linked to the camp; relocating the service and providing a general laundry facility for park visitors is not necessary.
Housekeeping Camp Shower Houses and Restrooms	Retained	<b>Yes:</b> Public restrooms are needed in many areas throughout the river corridor to comply with public health regulations and meet the basic personal needs of visitors and employees. The public showers at Housekeeping Camp are provided for guest use as well as other patrons, including campers and hikers.	<b>No.</b> The Housekeeping Camp restrooms and shower houses are components of the overnight guest accommodations at this location. They are required to be located within or very near the overnight sleeping units.
Housekeeping Camp Grocery	Service eliminated / facility removed	<b>No:</b> This need for the grocery store is tied to the level of lodging units at Housekeeping Camp. With a reduction of lodging, the grocery store is not needed.	<b>N/A:</b> This service will be eliminated.
Camp Curry Overnight Parking	Retained	<b>Yes:</b> Parking at Curry Village is needed to support the day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Orchard Parking Area	Re-developed	<b>Yes:</b> Parking at Curry Village Orchard is needed to support day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Village Lodging and Shower Houses	Expanded	<b>Yes:</b> Curry Village offers rustic and economy overnight guest accommodations consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs. This facility is needed to support public use by visitors who do not camp.	<b>No.</b> This lodging facility is part of a National Register Historic District. It is not feasible to relocate the complex, including shower and toilet facilities needed by guests in without-bath accommodations, to locations outside the river corridor.

**TABLE 8-43: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 5**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Curry Village Raft Rental	Service eliminated / facility removed	<b>No:</b> This is not a vital visitor service under this alternative.	<b>N/A:</b> This service will be eliminated.
Concessioner Stables	Retained (but day-rides eliminated)	<b>Yes:</b> The stable operation at Curry Village supports the High Sierra Camp operations. The location of the stables is within reach of each of the high sierra camps by one day's ride and trailering stock from El Portal or Wawona would be a substantial operational burden due to time and distance required to reach trailheads.	<b>No.</b> There are no other suitable locations for a stable operation, neither in proximity to other visitor services nor proximity to the Valley trail system used to access the Merced Lake High Sierra Camp.
Concessioner Stables Employee Housing Area	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Retained	<b>Yes:</b> This road is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that connects all major visitor service nodes. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway from its present location.
Southside Drive (through Stoneman Meadow)	Retained	<b>Yes:</b> This road is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that connects all major visitor service nodes. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway from its present location.
Sugar Pine Bridge	Removed	<b>No.</b> Under this alternative removal of this facility is consistent with land use restoration goals, and pedestrian and bicycle traffic would be re-routed north of river.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Ahwahnee Bridge	Retained	<b>Yes:</b> This pedestrian, bicycle, and emergency vehicle bridge is needed to support public use of the river corridor. It allows safe crossing of the Merced River so that visitors can access points of interest in Yosemite Valley. Pedestrian and bicycle bridges also protect riparian habitat from destruction caused by random crossings throughout the river corridor. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Stoneman Bridge	Retained	<b>Yes:</b> This pedestrian, bicycle, and emergency vehicle bridge is needed to support public use of the river corridor. It allows safe crossing of the Merced River so that visitors can access points of interest in Yosemite Valley. Pedestrian and bicycle bridges also protect riparian habitat from destruction caused by random crossings throughout the river corridor. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.

TABLE 8-43: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 5

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Upper Pines RV and Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Former Upper River Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Eagle Creek Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
<b>Segment 2: Yosemite Village and Housekeeping Camp</b>			
Ahwahnee Row Employee Housing	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lower Tecoya Employee Housing Area	Retained	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services consistent with the land use restoration and visitor experience goals of this alternative.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lost Arrow Employee Housing Area	Re-developed (with permanent housing)	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services consistent with the land use restoration and visitor experience goals of this alternative.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Re-route Northside Drive south of Yosemite Village Day-use Parking Area at least 150 feet from the ordinary high-water mark	Re-routed roadway	<b>Yes:</b> This roadway serves as the exit road for all Yosemite Valley traffic. The congestion created in this vicinity is a result of pedestrian-vehicle conflicts that would be completely mitigated if no pedestrians were required to cross the road from the parking lot to access numerous visitor services including the primary visitor center, museum, and the Valley shuttle.	<b>No.</b> While some changes to the exact location of the road system could be feasibly rerouted for approximately ¼ mile, it could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor traffic in Yosemite Valley is identified.
Traffic Circle at Intersection of Northside Drive and Village Drive (at Yosemite Village Day-use Parking Area) (New)	Constructed	<b>Yes:</b> Planned components of the primary transportation & circulation road system that connects all major visitor service nodes.	<b>No.</b> No changes are proposed for the existing road system in Yosemite Valley. Improvements for this location are required to increase efficiency of transportation circulation.

**TABLE 8-43: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 5**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp (cont.)</b>			
Yosemite Village Day-use Parking Area	Re-developed and expanded	<b>Yes:</b> This facility will serve as the primary day-use parking lot for Yosemite Valley because it is proximate to numerous visitor services including the primary visitor center, museum, and the Valley shuttle. A day-use visitor parking area of this size is needed to support the level of public use that has been found to protect and enhance river values.	<b>No.</b> While some changes to the exact location of the parking lot and road system leading to the parking lot could be feasibly relocated, the parking lot could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor parking in Yosemite Valley is identified.
Residence 1 (Superintendent's House)	Relocated	<b>Yes.</b> This historic structure is a component of the Historic Resources ORV and would be rehabilitated and used to support the visitor experience.	<b>Yes.</b> Under this alternative, the facility would no longer be a component of the Historic Resources ORV and could be relocated outside the river corridor to the lower NPS housing area.
<b>Segment 2: Yosemite Lodge and Camp 4 Area</b>			
Yosemite Lodge Overnight Units	Retained	<b>Yes:</b> Yosemite Lodge offers mid-scale and economy overnight guest accommodations for visitors who do not or are unable to camp. The number of units allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	No. While some buildings within the Yosemite Lodge complex could be relocated to sites further north of the Merced River, however, it is not feasible to consider a wholesale relocation of the complex to an alternative location.
Yosemite Lodge Overnight Parking	Retained	<b>Yes:</b> Parking is needed to support visitors who stay at Yosemite Lodge. Parking is also needed for park partner organizations and NPS staff who use the Lodge's meeting and interpretive spaces (i.e., the Cliff Room, Gardner Terrace, and the outdoor amphitheater).	<b>No.</b> As long as visitor services are provided at Yosemite Lodge, it will be necessary to provide parking near the Lodge complex.
Yosemite Lodge Garden Terrace and Cliff Room	Retained	<b>Yes:</b> These areas are used for interpretive programs and for training courses, meetings, and special events. These facilities are vital to National Park Service and park partner operations.	<b>No.</b> The Garden Terrace and Cliff Rooms are within the existing buildings at the Yosemite Lodge complex. The activities taking place at these locations could be considered for relocation to alternative facilities, however, it is not feasible to consider removing the buildings in their entirety.
Yosemite Lodge Gift and Grocery (Convenience Shop)	Reduced	<b>Yes:</b> The facility provides visitors a limited range of merchandise including packaged and fresh groceries, sundries, and outdoor products frequently needed by campers and hikers.	<b>No.</b> The building currently housing the Yosemite Lodge Gift and Grocery Store is part of the Yosemite Lodge food service and retail structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Mountain Room Bar & Food Service	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room Bar is part of the Yosemite Lodge food service structure and would be infeasible to relocate.

TABLE 8-43: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 5

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp (cont.)</b>			
Yosemite Lodge Mountain Room Restaurant	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room restaurant is part of the Yosemite Lodge food service structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Highland Court Employee Housing (Existing and New)	Replaced with permanent housing proximate to current location	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
Yosemite Lodge Employee Housing (Thousands Cabins) (Existing)	Removed and relocated (incorporated into permanent housing above)	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
Yosemite Lodge Day-use Parking Area (New)	Constructed	<b>Yes:</b> This facility will serve as a critical day-use parking lot for Yosemite Valley because substantial numbers of roadside parking spaces adjacent to meadows will be removed in the vicinity of the Yosemite Village Day-use Parking Area. This new parking area will serve as trailhead parking for the upper and lower Yosemite Falls trail, and overflow evening parking for Camp 4 Campground. It will also be used for the Waghoga Cultural Center.	<b>No.</b> No alternative areas of sufficient size or location proximate to upper and lower Yosemite Falls trailhead, Waghoga, Camp 4 and the Yosemite Lodge could accommodate this parking area.
Yosemite Lodge intersection with Northside Drive: Yosemite Falls Pedestrian Underpass (New)	Constructed	<b>Yes:</b> A pedestrian underpass is vital to reduce pedestrian and vehicle conflicts at this extremely busy intersection area. The pedestrian underpass would connect the pedestrians from the Yosemite Lodge Area to the Lower Yosemite Fall Area without requiring westbound traffic on Northside Drive to stop and allow pedestrians to cross the road.	<b>No.</b> No changes are proposed for the existing road system in Yosemite Valley. Improvements for this location are required to increase efficiency of transportation circulation.
<b>Segment 2: West Yosemite Valley</b>			
West Valley Overflow Parking Area (New)	Constructed	<b>Yes:</b> This parking area will provide a vital queuing and staging area during peak use periods when congestion in the East Yosemite Valley reaches conditions whereby the National park Service would not permit more vehicles to add to the crowding. Visitors would have a choice to either use El Capitan Cross-over and visit other areas of the park, or wait until outbound traffic has reduced congestion in the East Yosemite Valley.	<b>No.</b> There are no other suitable locations (i.e., near the intersection of North- and Southside Drives with the El Capitan Crossover) that allow for the redirection of vehicle traffic entering east Yosemite Valley.
Yellow Pine Administrative	Retained	<b>Yes:</b> This administrative camping area is used by volunteers and researchers whose work is critical to meeting our NPS mission.	<b>No.</b> No alternative areas of sufficient size or location could accommodate this campground.

**TABLE 8-43: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 5**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 4: El Portal</b>			
Rancheria Employee Housing Area (New)	Constructed	<b>Yes:</b> This housing facility is necessary to accommodate employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs, and to accommodate employees who provide resource protection services consistent with the mission of the National Park Service and current agency management policies.	<b>No.</b> In-fill employee housing should occur within existing employee housing areas
El Portal Remote Parking at Abbieville / Trailer Village (New)	Constructed	<b>Yes:</b> This parking area will provide a vital queuing and staging area during peak use periods when congestion in the East Yosemite Valley reaches conditions whereby the National park Service would not permit more vehicles to add to the crowding. Day-use visitors would be provided shuttle service to Yosemite Valley from this location.	<b>No.</b> There are no other suitable locations proximate with direct access to Highway 140 before entering Yosemite National Park boundary.
<b>Segment 5 (Wild), Segments 6 &amp; 7 (Recreational), Segment 8 (Wild)</b>			
Wawona Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> This campground could not be relocated as no suitable alternative site exists in the Wawona proper adjacent to the river, which is an integral part of the camping experience.
Wawona Hotel Tennis Court	Retained	<b>Yes:</b> This visitor activity is a component of the Wawona Hotel NHL. Opportunities for this type of visitor recreation are unique in terms of setting attributes and the historic setting of the district.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.
Wawona Hotel Golf Course & Shop	Retained	<b>Yes:</b> This visitor activity is a component of the Wawona Hotel NHL. Opportunities for this type of visitor recreation are unique in terms of setting attributes and the historic setting of the district.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.
Wawona Stables	Retained	<b>Yes:</b> The Wawona Stables offer visitors commercial equestrian day rides to points of interest in the Wawona area. This facility is necessary to support horseback riding, which is a type of use that has been found to be consistent with the protection and enhancement of river values.	<b>No.</b> The stable operates from a historic structure that could not be feasibly relocated.
Wawona Commercial Horseback Day Rides	Retained	<b>Yes:</b> The Wawona Area will be the only are within Yosemite National Park that provides an opportunity for this type of visitor recreation. Commercial day rides are proposed to be eliminated in Yosemite Valley and Tuolumne Meadows.	<b>No.</b> The stable operates from a historic structure that could not be feasibly relocated.



## **Conceptual Site Drawings for Potential Project Implementation**

### ***Boys Town***

In Alternative 5, the existing Boys Town cabins and facilities would be removed and replaced with 98 new lodging units suitable for year-round accommodation. This would consist of 25 duplex buildings, two 4-plex buildings, and five two-story 8-plex buildings, all with private baths. A new 2,840 foot long pedestrian pathway, a guest check-in building, 78 new parking spaces along the existing roadway, and 20 new parking spaces along the eastern edge of the Orchard Parking lot would also be constructed within the existing developed footprint. The Curry Orchard Day-use Parking Area would be formalized using best management practices to have a total of 450 parking spaces. New ground disturbance within the existing 8.4 acre footprint of Boys Town would include approximately 33,000 square feet for new buildings, 56,800 square feet of utility trenching, 14,200 square feet for pedestrian pathways, and 29,400 square feet of new parking for a total of 3 acres. Construction staging would require an area of approximately 1.4 acres and would likely take place within the existing Orchard Parking area.

### ***Yosemite Village Day-use Parking Area***

In Alternative 5, the existing 6-acre Yosemite Village Day-use Parking Area and all associated roadway improvements would be moved 150 feet north from the high water mark of the river to facilitate riparian restoration goals and to prevent further resource damage. Restoration actions would remove non-native fill material, re-contour the topography, and plant native vegetation. The redesigned parking area would be formalized to provide a total of 850 parking spaces and a new comfort station. Northside drive would be realigned to the south edge of the parking area where it would connect with Sentinel Drive and continue west to Yosemite Falls and park exits. A new three-way intersection would be constructed connecting Sentinel Drive with the re-routed Northside Drive, and the shuttle bus road into the Village. This intersection would include turning lanes to minimize traffic delays and maintain proper traffic flow. Consolidating the parking to the north of Northside Drive, with new and improved walkways to Yosemite Village, would eliminate vehicle and pedestrian conflicts. A roundabout would be constructed at the Village Drive/Northside Drive intersection which would improve traffic flow. The Concessioner General Office, Valley Garage, and Arts and Activities Center (former bank building) would be removed and the Village Sport Shop repurposed to a visitor contact station.

The area of disturbance for improvements at Camp 6 in Alternative 5 would cover approximately 27.5 acres and include 19 acres of clearing and grubbing, 1.2 acres for existing building removal, 4,000 square feet for the new comfort station, 5.4 acres of pavement removal, 2.3 acres of new roadway, 8.3 acres for new parking, 18,280 square feet of utility service trenching, and 50,070 square feet for new pedestrian pathways. Construction staging would cover an area of approximately 2 acres within the area to be redeveloped.

### ***Yosemite Lodge Parking Area***

In Alternative 5, an area west of Yosemite Lodge currently used as parking for tour buses, transit buses, and overnight guests would be re-developed to provide 300 day-use parking spaces, parking for 15 buses, a new 3,000 square foot comfort station, and a relocated shuttle stop. The existing tour bus drop off area would be relocated to the Highland Court area. The wellness center, linen storage and laundry buildings would be removed. Ground disturbance over a 13.5 acre area west of the Lodge would include 10.6 acres of clearing

and grubbing, 55,850 square feet of existing building and pavement removal, 3,000 square feet for the new comfort station and shuttle stop, 17,300 square feet of utility service trenching, 3.6 acres for parking, and 5,000 square feet for pedestrian pathways. Construction staging would take place over a 2 acre area within the existing footprint. Existing vegetation would be retained to separate and screen parking bays while bioswales would serve to filter and treat storm water run-off.

### ***Yosemite Lodge Housing***

In Alternative 5, the temporary modular housing at Highland Court and the Thousands Cabins would be removed and replaced with two new buildings to house 104 concessioner employees. In addition, a new parking area would provide 78 employee parking spaces, parking for 3 shuttle buses, and 53 day-use parking spaces for the public. Ground disturbance for the two housing sites would cover a total of 7.4 acres and would include 45,500 square feet of preparation for the new buildings, 5,500 square feet of utility service trenching, and 1.8 acres for parking.





Huff House Employee Housing  
Replace temporary housing with permanent facilities,  
164 beds and 164 parking spaces

- 1 Construct 4 two-story buildings for 32 occupants, 8 occupants per building.
- 2 Construct 11 two-story buildings for 132 occupants, 12 occupants per building.
- 3 Provide common recreational area, approximately 3,600 square feet.
- 4 Build plaza areas and walkways with site furnishings, accent paving, and enhanced landscaping.
- 5 Construct a shuttle bus stop.
- 6 Remove ice rink and bicycle rentals. Construct an employee parking facility with 164 spaces.
- 7 Retain historic residence for housing purposes.

Boys Town Guest Lodging  
Replace tent cabins with 98 permanent guest cabins and 78 parking spaces

- 8 Construct 25 duplex buildings replicating historic cabins, or 50 units subtotal.
- 9 Construct 2 four-plex buildings, or 8 units subtotal
- 10 Construct 5 eight-plex buildings, or 40 units subtotal
- 11 Relocate Campground Reservation Center, provide 8 parking spaces.
- 12 Construct a roadway connecting Curry Village and East Valley Campgrounds with 78 parking spaces guests and 8 short-term parking spaces for Campground Reservation Center. 20 parking spaces will be reserved for guest use in Curry Orchard Parking Area.

Curry Orchard Parking Area

- 13 Improve parking area with 430 spaces and landscape buffers with trees and bioswales that will treat storm water run-off.

Meadow Restoration Area

- 14 Improve hydrology, remove invasive species, promote weed control and plant native species.

Existing Curry Village Visitor Services

- 15 Retain existing historic cabins and Stoneman Cottage (65 lodging units).
- 16 Retain existing Curry Pavilion.
- 17 Retain 290 tents.

\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



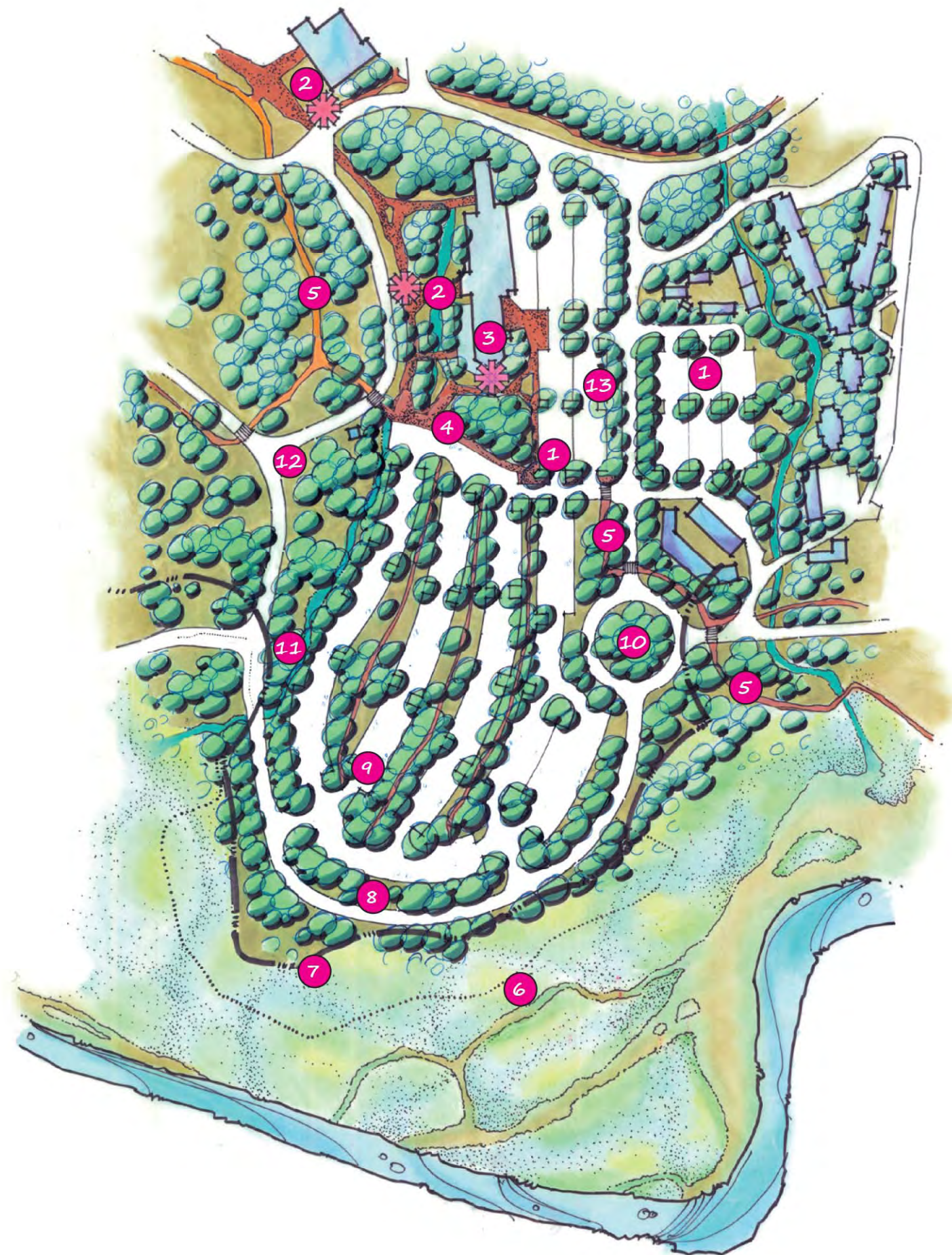
## Alternatives 5 and 6 Conceptual Site Drawing for Curry Village

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- 1 Eliminate Concessioner General Office and Garage located between the Village Store and Ahwahnee Meadow, providing more space for visitor parking.
- 2 Retain shuttle stops on Visitor Center Loop Drive.
- 3 Replace Village Sport Shop with visitor contact station.
- 4 Eliminate existing art activity center and improve pedestrian access.
- 5 Improve pedestrian connections and bike paths east and west of the day-use parking area.
- 6 Linework represents existing day-use parking area limits.
- 7 Reduce encroachment of day-use parking area to provide 150-foot riparian buffer. Restore wetlands and meadows.
- 8 Re-route Northside Drive to conform to the 150-foot riparian buffer. Consolidate all parking north of the roadway, minimizing pedestrian and vehicular conflicts.
- 9 Provide 850 day-use parking spaces. Provide landscaped areas to retain large numbers of trees and screen parking bays and bioswales that will treat storm water run-off. Provide pedestrian pathways.
- 10 Construct a roundabout to alleviate traffic congestion at the intersection of Northside Drive and Village Drive.
- 11 Re-align Sentinel Drive into a "T" intersection with a re-routed Northside Drive. Provide left-hand turn lanes off Sentinel Drive and Northside Drive. Create a sense of arrival through wayfinding and landscape treatments.
- 12 Reconstruct Northside Drive and Visitor Center Loop Drive as a "T" intersection.
- 13 Enhance Village Drive by establishing a tree-lined roadway as a connection to day-use parking facilities and lodging.



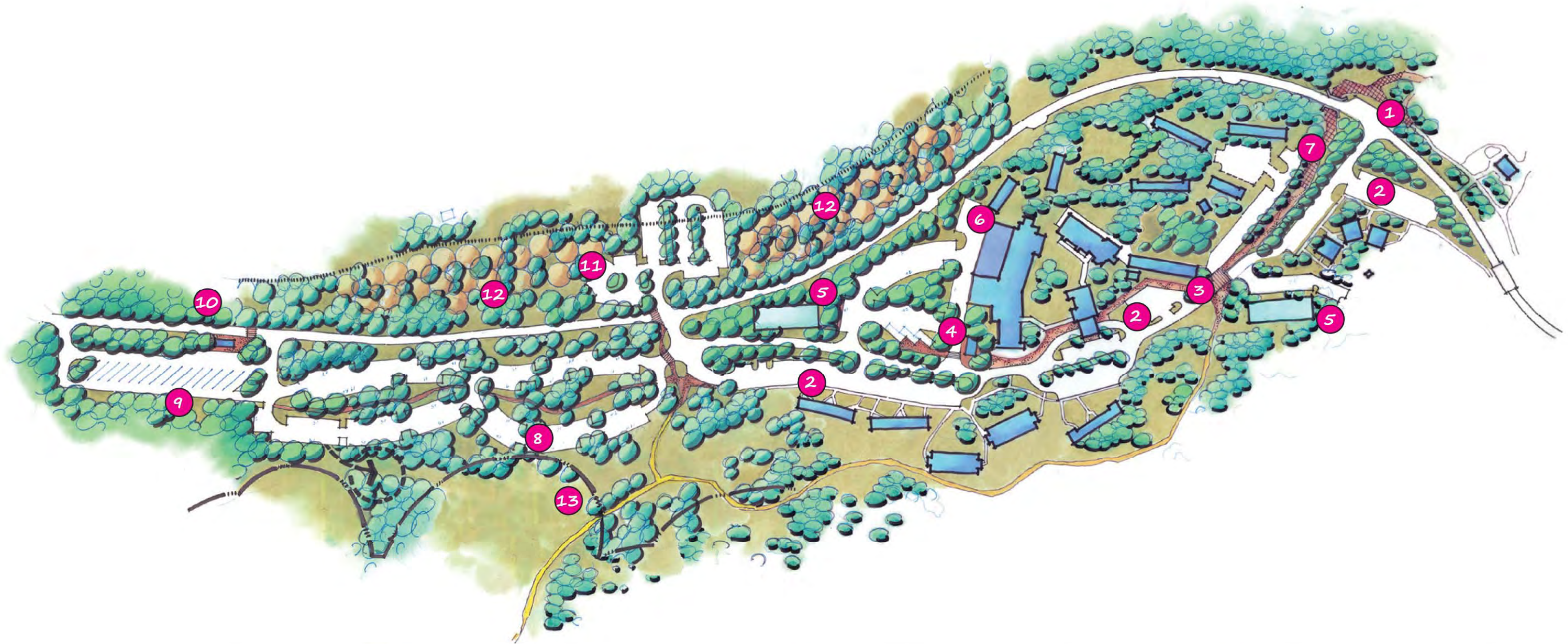
**Alternative 5**  
**Conceptual Site Drawing for**  
**Yosemite Village Day-use Parking Area**  
 Yosemite National Park  
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\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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**1** Re-align Yosemite Lodge intersection within the limits of existing developed areas.

**2** Maintain all existing Yosemite Lodge buildings and parking areas.

**3** Enhance pedestrian circulation system.

**4** Construct tour bus loading and unloading area, with shelter.

**5** Construct employee housing in 2 two-story buildings with 52 occupants per building and 39 employee parking spaces per building.

**6** Relocate linen storage and laundry buildings from the 100-year floodplain to an addition to the food service building. Reconfigure truck loading and unloading area. Demolish and remove existing NPS volunteer office.

**7** Re-construct a section of the Yosemite Lodge entrance road as a promenade with 5% slope to underpass. Install accent paving, landscaping, wayfinding and site furnishings, low-voltage site lighting consistent with design features of the Yosemite Falls trail.

**8** Construct 300 visitor parking spaces at Yosemite Lodge Day-use Parking Area. Maintain existing vegetation as buffers to separate and screen parking bays, provide pedestrian pathways and bioswales that will treat storm water run-off.

**9** Construct 15 tour bus parking spaces.

**10** Construct a shuttle bus stop with shelter and comfort station.

**11** Construct 41 additional parking spaces at Camp 4.

**12** Retain 35 existing walk-in campsites at Camp 4. Construct 35 additional walk-in sites opposite existing parking facility. Occupancy is limited to 6 campers per site. Standard walk-in campsite is 3,850 square feet (70-foot diameter), including 1,200 square feet of clearance with a 15-foot perimeter buffer.

**13** Protect and enhance a 150-foot riparian buffer.

\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



## Alternative 5 Conceptual Site Drawing for Yosemite Lodge and Camp 4 Yosemite National Park

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## ALTERNATIVE 6: DIVERSIFIED VISITOR EXPERIENCES AND SELECTIVE RIVERBANK RESTORATION

### Overview

The guiding principles of Alternative 6 include limited restoration within 100 feet of the river and in meadow and riparian areas, infrastructure improvements to accommodate growth in peak daily visitation in Yosemite Valley, and expansion of facilities and services to allow for diversified visitor experiences.

Management actions in Alternative 6 would:

- Restore 170 acres of meadow and riparian habitat.
- Significantly increase the campsite inventory in all river segments (+46%) and in Yosemite Valley (+59%).
- Significantly increase the lodging inventory in all river segments (+18%) and in Yosemite Valley (+21%)
- Increase day-use parking for Yosemite Valley (+11%).
- Expand facilities and services to accommodate growth in visitation.
- Reduce traffic congestions and improve traffic circulation through infrastructure improvements such as roundabouts and underpasses.
- Accommodate approximately 21,800 visitors per day in East Yosemite Valley.
- Continue to manage overnight use capacity through wilderness quotas and reservation systems for lodging and camping.
- Manage day-use capacity for East Yosemite Valley through intentional traffic diversions and monitoring.

### *Actions to Protect and Enhance River Values*

Alternative 6 would protect and enhance river values through selective ecological restoration of riverbanks and riparian and meadow habitat, corridorwide. This alternative would ecologically restore the area of Housekeeping Camp that is within the bed and banks of the river and remove much of the development within 100 feet of the river. Hydrologic connectivity of meadows to the riparian floodplain would be enhanced through engineering and design treatments, such as installation of large box culverts and permeable subgrades to improve surface water flow. Alternative 6 would include a valley oak habitat protection area in El Portal.

All historic bridges would be retained; however, the free-flowing condition of the river would be enhanced by increasing channel complexity through installation of constructed log jams, strategic placement of large wood, removal of rip rap, and bioengineering of the riverbank. If subsequent monitoring of riparian condition reveals insufficient improvement over time, more aggressive management action may be initiated, including the possible removal of Sugar Pine Bridge.

Cultural and scenic values would be protected and enhanced as described under “Actions Common to Alternatives 2-6” (beginning on page 8-53). Recreational values would be protected and enhanced by dispersing lower levels of boating along the river through Yosemite Valley and by reducing traffic congestion. Table 8-44 provides a summary of the proposed ecological restoration actions and the reasons for those proposed actions.

**TABLE 8-44: ADDITIONAL ACTIONS TO PROTECT AND ENHANCE RIVER VALUES, ALTERNATIVE 6**

<b>Ecological Restoration Actions (Free Flow, Water Quality, Geologic/Hydrologic, and Biological Values)</b>	
<b>Corridorwide</b>	
<b>Ecological Restoration Acreage</b>	164 acres (common to all) plus an additional 6 acres (refer to Appendix E for specific locations)
<b>Riprap to be Removed</b>	5,700 linear feet (common to all) plus an additional 348 feet (refer to Appendix E for specific locations)
<b>Segment 2: Yosemite Valley</b>	
<b>Free Flow / Geologic/Hydrologic Values</b>	<ul style="list-style-type: none"> <li>Remove Sugar Pine Bridge to enhance the free-flowing condition of the river.</li> </ul>
<b>Riparian Buffer / Floodplain</b>	<ul style="list-style-type: none"> <li>Ecologically restore part of Housekeeping Camp within the ordinary high-water mark (bed and banks) of the river.</li> <li>Ecologically restore portions of Backpackers Camp, North Pines Campground, and Lower Pines Campground that are within 100 feet of the river.</li> <li>Ecologically restore 19.7 acres of habitat in former Upper and Lower River Campgrounds and construct new campsites 150 feet away from the river.</li> <li>Move Yosemite Village Day-use Parking Area parking north at least 150 feet away from the river.</li> </ul>
<b>Recreational Values</b>	
<b>Segment 1: Wilderness above Nevada Fall</b>	
<b>Wilderness Recreation</b>	<ul style="list-style-type: none"> <li>Visitor overnight use concentrated to designated camping areas</li> </ul>

### *User Capacity, Land Use, and Facilities Management*

Alternative 6 would focus on providing diverse visitor experiences, and allows for an increase in peak visitor use levels. It would accommodate the largest increase in camping and provide for expanded facilities and services (see Table 8-45). Proper infrastructure design and site delineation in high use areas would be incorporated to ensure the long-term protection of river values.

**Table 8-45: User Capacities by Use Type and Location - Alternative 6**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 6	
	Unit Type	Units	People	Units	People
<b>Wilderness Above Nevada Fall</b>					
Visitor Overnight Use	Zone Capacities & Beds	380	380	380	380
Visitor Day Use	Day Hikers	350	350	350	350
Employee Housing	Employee Beds	15	15	15	15
Administrative Day Use	Day Patrols	5	5	5	5
<b>Yosemite Valley</b>					
Visitor Overnight Use	Rooms & Campsites	1,500	6,564	1,987	9,006
Visitor Day Use	Parking Spaces	-	8,272	-	9,449
Employee Housing	Employee Beds	1,315	1,315	1,136	1,136
Administrative Day Use	Parking Spaces	166	332	166	332
<b>Merced Gorge</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	180	869	180	869
Employee Housing	Employee Beds	9	9	9	9
Administrative Day Use	Parking Spaces	2	4	2	4

**Table 8-45: User Capacities by Use Type and Location - Alternative 6**

User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 6	
	Unit Type	Units	People	Units	People
<b>El Portal</b>					
Visitor Overnight Use	Rooms & Campsites	-	-	-	-
Visitor Day Use	Parking Spaces	214	740	414	740
Employee Housing	Employee Beds	192	192	506	506
Administrative Day Use	Parking Spaces	610	1,220	610	1,220
<b>South Fork Above Wawona</b>					
Visitor Overnight Use	Permits	20	20	20	20
Visitor Day Use	Day Hikers	6	6	6	6
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1
<b>Wawona</b>					
Visitor Overnight Use	Rooms & Campsites	203	865	190	787
Visitor Day Use	Parking Spaces	-	1,295	-	1,606
Employee Housing	Employee Beds	121	121	121	121
Administrative Day Use	Parking Spaces	30	60	30	60
<b>South Fork Below Wawona</b>					
Visitor Overnight Use	Overnight Hikers	3	3	3	3
Visitor Day Use	Day Hikers	3	3	3	3
Employee Housing	Employee Beds	-	-	-	-
Administrative Day Use	Day Patrols	1	1	1	1

## Visitor Overnight Capacity

### Camping

The campsite inventory in the Merced Wild and Scenic River corridor, including Yosemite Valley, would be increased by approximately 59%. All campsites within 100 feet of the river would be removed. Campsite losses would be offset with the addition of new camping adjacent to Upper Pines Campground and east of Camp 4, as well as new sites west of the Backpackers Camp, in the former Upper and Lower River Campgrounds area, and in the West Valley. Under Alternative 6, the total number of campsites in Yosemite Valley would increase to 739—a net gain of 273 sites—and the total number of campsites available in the corridor would be 825. Table 8-46 provides a summary of the proposed changes to camping.

**TABLE 8-46: CAMPING FACILITIES - ALTERNATIVE 6**

Existing Locations	Alt 1 (No Action)	Alt 6	Details
Backpackers	25 sites	10 sites	15 walk-in sites removed within 100 feet of river and relocated west of the area
Camp 4	35 sites	35 sites	No change to this National Historic Register Site
Lower Pines	76 sites	71 sites	5 sites removed from within 100 feet of the river
North Pines	86 sites	72 sites	14 sites removed from within 100 feet of the river
Upper Pines	240 sites	238 sites	2 sites for cultural resource concerns
Yellow Pine Administrative	4 sites	4 sites	No changes to these group administrative sites
Wawona Campground	99 sites	86 sites	13 sites removed within 100 feet of river or in culturally sensitive areas
<b>Total Existing Locations</b>	<b>565 sites</b>	<b>516 sites</b>	

**TABLE 8-46: CAMPING FACILITIES - ALTERNATIVE 6**

New Locations	Alt 1	Alt 6	Details
West of Backpackers	0 sites	16 sites	16 walk-in sites relocated from Backpackers Camp outside 100-year floodplain
East of Camp 4	0 sites	35 sites	35 walk-in sites in area east of Camp 4
Upper Pines	0 sites	87 sites	36-site RV loop and a walk-in campground with 49 sites and 2 group sites
Former Upper River	0 sites	32 sites	30 walk-in and 2 group sites created 150 feet from river in the former footprint of the Upper River Campground impacted by the 1997 flood
Former Lower River	0 sites	40 sites	40 walk-in sites created 150 feet from the river in the former footprint of the Upper River Campground impacted by the 1997 flood
Yosemite Lodge	0 sites	20 sites	20 RV sites west of lodge and adjacent to parking area
Eagle Creek	0 sites	79 sites	79 car & RV sites added east of El Capitan Picnic Area
<b>Total New Camping</b>	<b>0 sites</b>	<b>309 sites</b>	
<b>Total Camping in Corridor</b>	<b>565 sites</b>	<b>825 sites</b>	

### *Lodging*

In-park lodging availability would be increased by approximately 21% as compared to existing conditions. Management actions related to lodging would focus on removing lodging from the ordinary high water mark at Housekeeping Camp and maintaining or increasing lodging capacities at other locations. Some tent cabins would be replaced with hard-sided lodging in Curry Village to increase the availability of year-round accommodations. Yosemite Lodge would be redeveloped outside of the 100-year floodplain with new three-story lodging structures with a total of 440 units. As a result of these actions, the in-park lodging inventory would be increased from 1,160 units to 1,374 units. Table 8-47 provides a summary of the proposed changes to lodging and the reasons for those proposed changes.

**TABLE 8-47: LODGING FACILITIES- ALTERNATIVE 6**

Wilderness	Alt 1 (No Action)	Alt 6	Details
Merced Lake High Sierra Camp	22 units (60 beds)	22 units (60 beds)	No change to this Wilderness lodging facility
Yosemite Valley	Alt 1	Alt 6	Details
Ahwahnee Hotel	123 rooms	123 rooms	No change at this National Historic Landmark
Housekeeping Camp	266 tent cabins	232 tent cabins	Remove 34 units out of the ordinary high-water mark (bed and banks of the river)
Curry Village	400 units	453 units (290 tents and 163 hard-sided units)	Retain 290 tents Retain 18 units at Stoneman House Retain 47 cabin-with-bath units Construct 98 hard-sided units in Boys Town
Yosemite Lodge	245 rooms	440 rooms	Construct a new three-story lodging structures with 440 units located outside the 100-year floodplain
Wawona	Alt 1	Alt 6	Details
Wawona Hotel	104 rooms	104 rooms	No change at this National Historic Landmark
<b>Total Lodging in Corridor</b>	<b>1,160 units</b>	<b>1,374 units</b>	



### Visitor Day Use Capacity and Access Improvements

Day-use parking capacity in Yosemite Valley would be expanded by 11% to meet current peak use demand and accommodate some future growth. **Error! Reference source not found.** provides a summary of the total number of parking spaces for each relevant segment of the corridor. If day-use parking demand continued to increase in the future, additional proactive management actions would be implemented.

**TABLE 8-48: NUMBER OF DAY-USE PARKING SPACES IN SEGMENTS – ALTERNATIVE 6**

Location	Alt 1 (No Action)	Alt 6
Segment 2: Yosemite Valley	2,337 spaces	2,598 spaces
Segment 3: The Gorge	180 spaces	180 spaces
Segment 4: El Portal	214 spaces	414 spaces*
Segment 7: Wawona	290 spaces	290 spaces
Total Parking	3,021 spaces	3,482 spaces
*The 200 new spaces in El Portal are located in the Abbieville Remote Parking area. While these spaces are located in El Portal, most of the use associated with these spaces will occur in Yosemite Valley.		

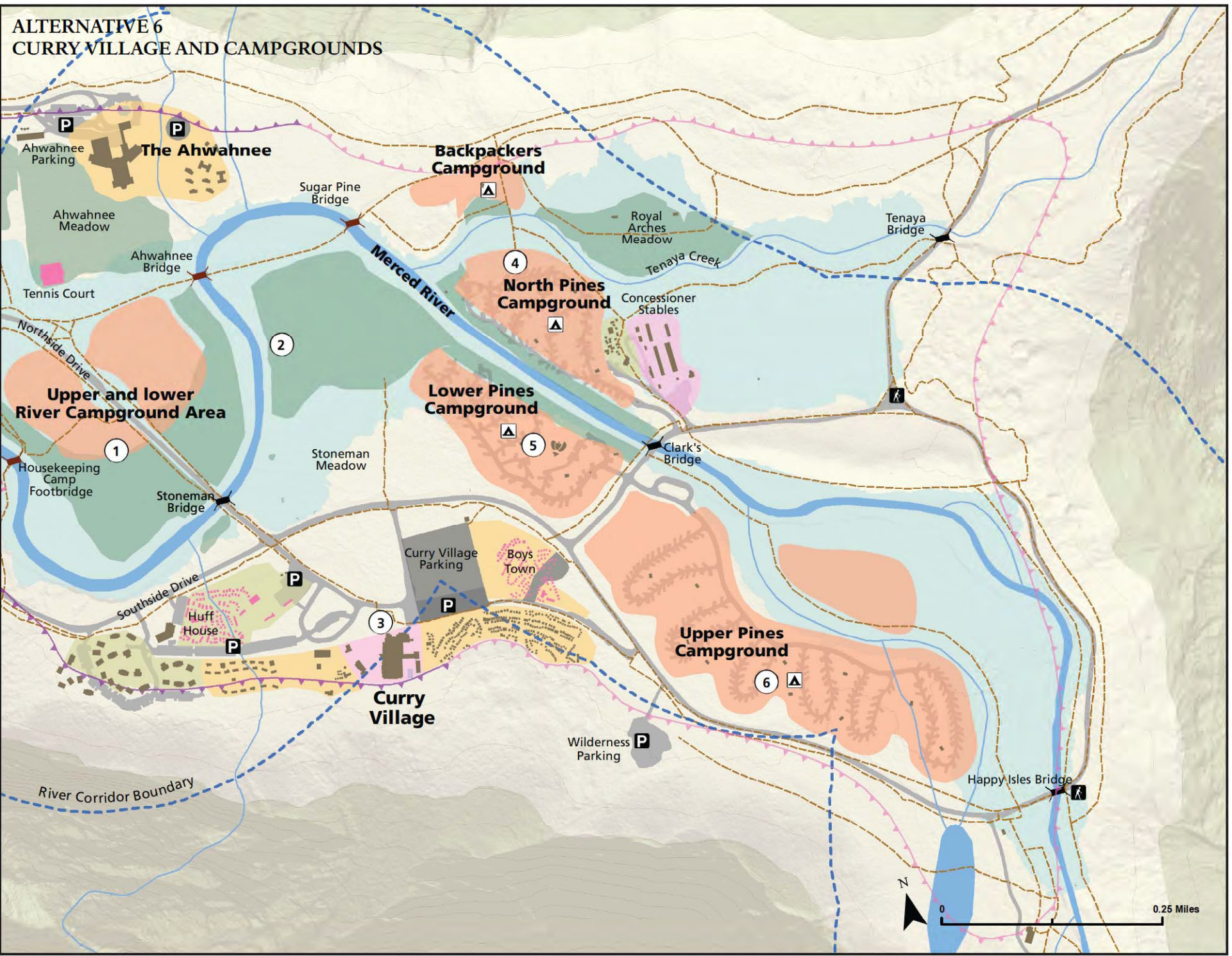
The most significant changes to parking and circulation would take place in the vicinity of Yosemite Village Day-use Parking Area, Yosemite Lodge, the West Valley, and in El Portal. Day use visitors would park at a redesigned parking area at Yosemite Village Day-use Parking Area, with a total of 850 parking spaces. A new day-use parking area with a total of 300 parking spaces would be constructed west of Yosemite Lodge. Overflow parking during times of peak visitation would be provided in West Yosemite Valley (300 parking spaces) and in El Portal at Abbieville (200 parking spaces). Total parking for East Yosemite Valley (including day, overnight and administrative uses) would be approximately 5,900 spaces.

Regional transit options would be expanded and optimized in this alternative. New services into Yosemite Valley would provide additional alternative transportation options to visitors. The NPS shuttle system would be expanded to serve locations in West Yosemite Valley, including Bridalveil Fall.

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# ALTERNATIVE 6: DIVERSIFIED VISITOR EXPERIENCES AND SELECTIVE RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: CURRY VILLAGE AND CAMPGROUNDS

- 1. Former Upper and Lower River Campground**
  - New Lower River Campground: Construct a new campground 150 feet away from the river with 40 walk-in sites. Provide picnic tables and parking for day use and directed river access to the Housekeeping Camp eastern beach. Restore hydrologic processes in the southeast portion of the area.
  - New Upper River Campground: Construct a new campground 150 feet away from the river with 30 walk-in sites and 2 group sites. Restore hydrologic processes in the southeast portion of the area.
  - Restoration: Restore 19.7 acres of floodplain. Protect the riverbank from trampling by fencing sensitive areas.
- 2. River Reach Between Bridges**
  - Ahwahnee and Sugar Pine Bridges: Retain both Ahwahnee and Sugar Pine bridges. Mitigate effects of bridge to ensure free-flowing condition through engineered solutions: Improve channel complexity by installing constructed log jams. Deposit large wood below Sugar Pine Bridge. Fill in the existing cut off channel before the Sugar Pine Bridge.
  - Stoneman Bridge: Mitigate effects of bridge to ensure free-flowing condition through engineered solutions: place large wood to lessen scouring, and use brushlayering, a constructed log jam, and culverts along Northside Drive.
- 3. Curry Village Area**
  - Lodging: Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units constructed in Boys Town; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.
  - Curry Orchard Parking Area: Provide 430 parking spaces through a re-design of the parking lot that uses best management practices to protect water quality. Also, apply engineering solutions to promote water flow and to increase drainage to Stoneman Meadow. Remove apple trees to mitigate human-bear interactions and plant native vegetation.
- 4. Lower Pines Campground Area**
  - Campground Sites: Retain 71 campsites and remove five sites from within 100 feet of river. Restore native plant communities in riparian area.
- 5. North Pines Campground Area**
  - North Pines Campground: Retain 72 campsites. Remove 14 sites from within 100 feet of river. Designate a formal river access point and restore native plant communities.
  - Backpackers Campground: Retain 10 walk-in sites. Remove 15 walk-in sites within the 100-foot riparian buffer to be replaced by 16 walk-in sites west of Backpackers Campground.
  - Concessioner Stables in Yosemite Valley: Retain the stables only to support the operation of the Merced Lake High Sierra Camp. Retain the kennel service. Retain associated housing (25 beds).
- 6. Upper Pines Campground Area**
  - Campground Sites: Retain 238 campsites. Remove two sites from sensitive resource area.
  - New RV Loop: Construct a new campground loop with 36 RV sites.
  - New Walk-in Campground: Construct a new walk-in campground with 49 sites and two group camping sites.

**Legend**

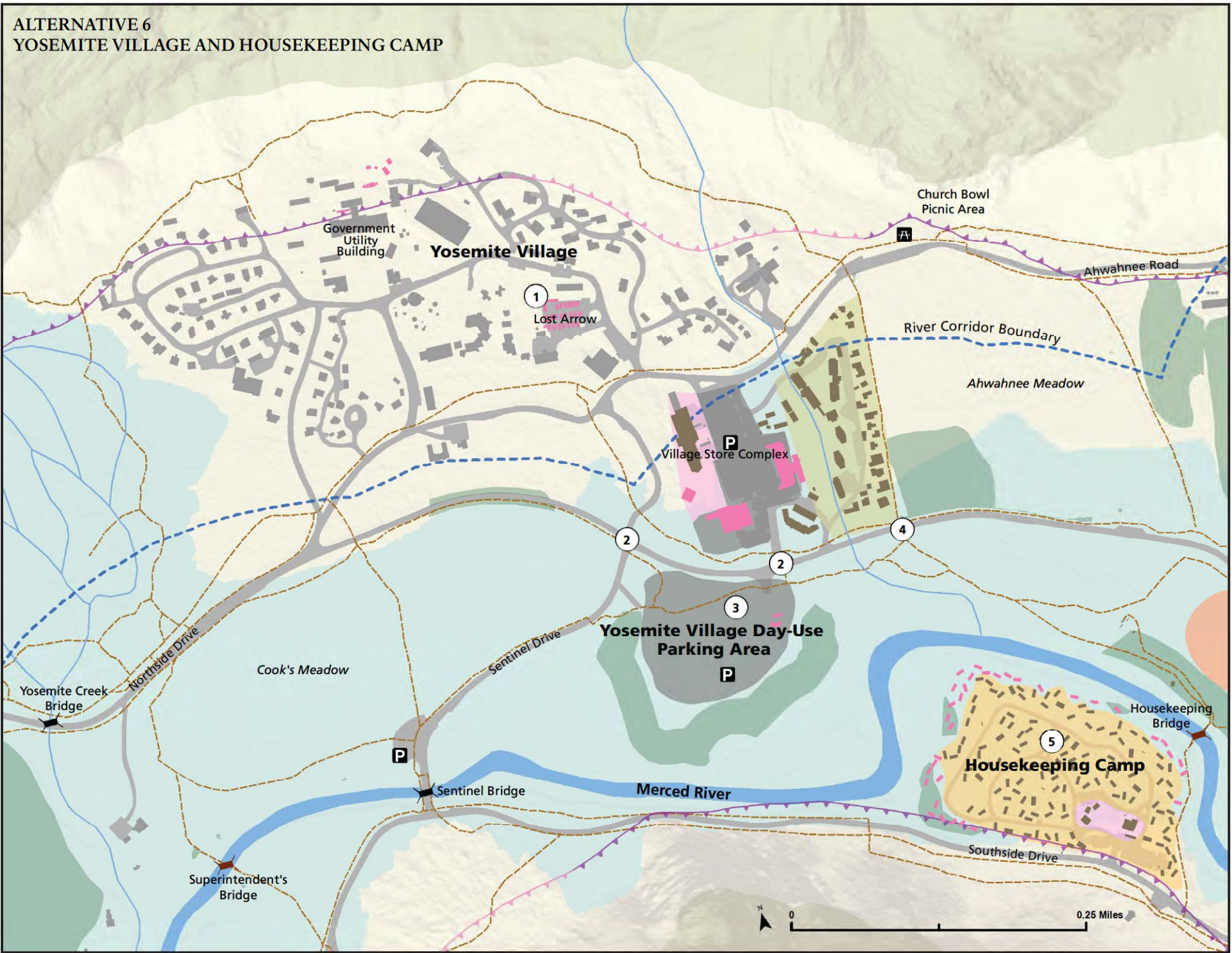
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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# ALTERNATIVE 6: DIVERSIFIED VISITOR EXPERIENCES AND SELECTIVE RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE VILLAGE AND HOUSEKEEPING CAMP

1. Lost Arrow: Replace temporary employee housing with permanent housing units for 50 beds.
2. Roadway Intersections
  - Sentinel Drive and Northside Drive: Construct a roundabout at Sentinel Road and Northside Drive (the "Bank 3-Way" intersection) to reduce vehicle congestion and improve traffic circulation.
  - Yosemite Village Day-use Parking Area: Construct a roundabout at Village Drive and Northside Drive to reduce vehicle congestion and improve circulation. Construct a pedestrian underpass beneath Northside Drive to minimize conflict between pedestrians and motorists. Add three-way intersection at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion at nearby intersections.
3. Yosemite Village Day-use Parking Area
  - Yosemite Village Day-use Parking Area: Move the parking area northward 150 feet away from the river to facilitate riparian restoration goals. Using best management practices to protect water quality, formalize the parking area with 850 parking places by re-developing part of the current administrative footprint as parking.
4. Indian Creek and Ahwahnee Meadow
  - Concessioner Employee Housing: Create a 50-foot setback from Indian Creek. Ecologically restore the riparian habitat, and protect using restoration fencing. Retain Ahwahnee Row and Tecoya employee housing.
  - Ahwahnee Meadow Restoration: Retain Northside Drive and bike path but increase culverts to improve hydrologic connectivity of the meadow. Replace 350 feet of trail with boardwalk to protect wetlands.
5. Housekeeping Camp
  - Housekeeping Camp Lodging: Retain 232 lodging units, and remove 34 lodging units out of the bed and banks of the river. Retain Housekeeping Camp shower houses, restrooms, laundry, and grocery store.

## Legend

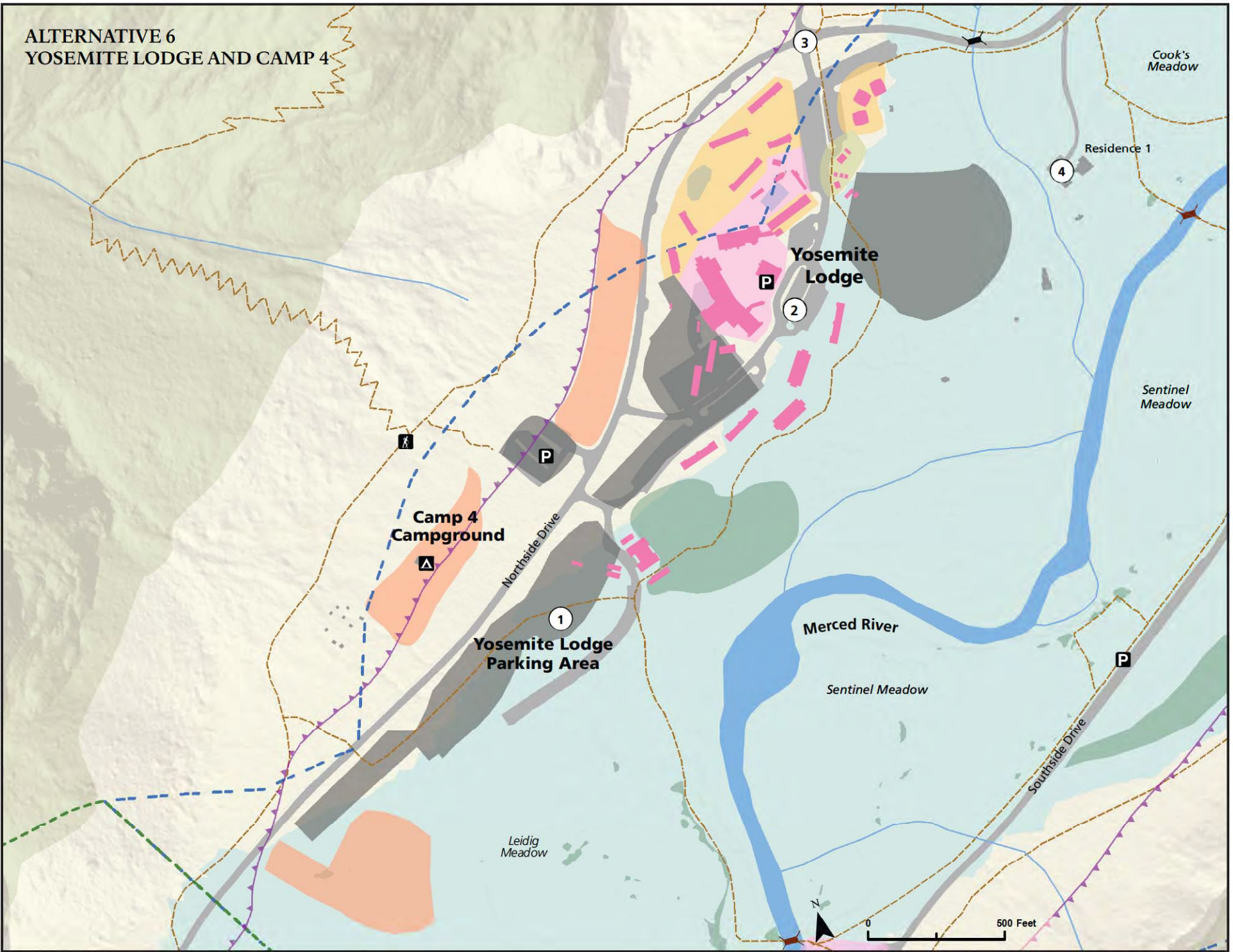
Campgrounds	Road bridge	Contour	Surfaced Areas	Visitor Services	Buildings	Designated Wilderness
Picnic Area	Footbridge	Trails	Restoration Areas	Housing	Retain Building	Recreational Segment
Parking Area	Lakes	Calculated Rock-fall Hazard Line	Camping	Operations	Remove Building	Wild Segment
Trailheads	Stream	Inferred Rock-fall Hazard Line	Lodging	Parking	100-year Floodplain	Scenic Segment



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# ALTERNATIVE 6: DIVERSIFIED VISITOR EXPERIENCES AND SELECTIVE RIVERBANK RESTORATION



## EAST YOSEMITE VALLEY: YOSEMITE LODGE AND CAMP 4

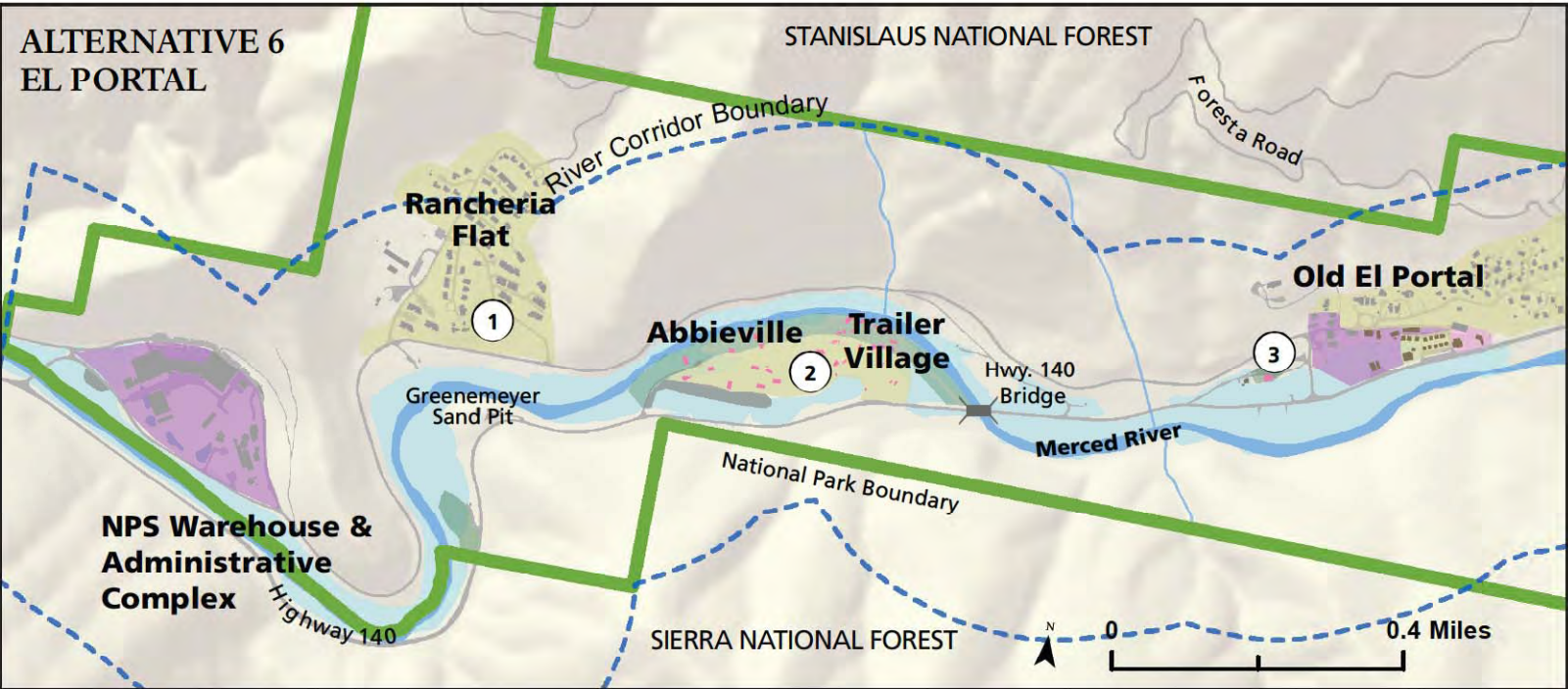
- 1. West of Yosemite Lodge**
  - Parking:** Redevelop disturbed area southwest of Yosemite Lodge to provide an additional 300 day-use parking spaces. This includes 15 spaces for tour bus parking. Parking redevelopment will incorporate best management practices to protect water quality.
  - RV Camping:** Construct 20 RVs sites adjacent to proposed parking.
- 2. Yosemite Lodge**
  - Lodging:** Construct 4 new 3-story lodging structures with a total of 440 units to achieve pre-1997 flood number of guest rooms. Redesign the entire lodging facility to avoid the 100-year floodplain.
  - Tour Buses:** Remove temporary housing complex at Highland Court and establish a tour bus drop-off area with three bus loading spaces.
  - Services and Facilities:** Retain Yosemite Lodge Food Court and Mountain Room bar and dining service. Re-purpose convenience shop and nature shop. Relocate Yosemite Lodge maintenance. Remove Yosemite Lodge post office, swimming pool, bike rental, snack stand, employee housing (called Thousands Cabins), Highland Court employee temporary housing, and the NPS Volunteer Office.
  - Site Restoration:** Remove four existing hotel buildings from the 100-year floodplain, decompact underlying soils, re-contour topography (using 1919 maps as a guide) and plant native vegetation (3.3 acres restored).
  - Yosemite Lodge Parking:** Create gravel parking area for the redesigned Yosemite Lodge with space for 395 cars.
  - Yosemite Lodge Concessioner Housing:** Remove housing at the "Thousands Cabins" and temporary housing at Highland Court. Replace with two new concessioner housing areas to accommodate 104 employees. Construct 78 employee parking spaces to serve new housing.
- 3. Yosemite Falls Intersection**
  - Traffic Congestion:** Construct a pedestrian underpass to alleviate conflicts between motorists and pedestrians and vehicles and associated traffic congestion at the intersection of Northside Drive and Yosemite Lodge Drive.
- 4. Residence 1**
  - Residence 1:** Relocate the historic structure, also know as the Superintendent's House, in its existing location to preserve the historic fabric while preparing the structure to withstand periodic flooding. The rehabilitation will follow the Secretary of Interior's Standards for the Treatment of Historic Properties and the Historic Structures Report. Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.



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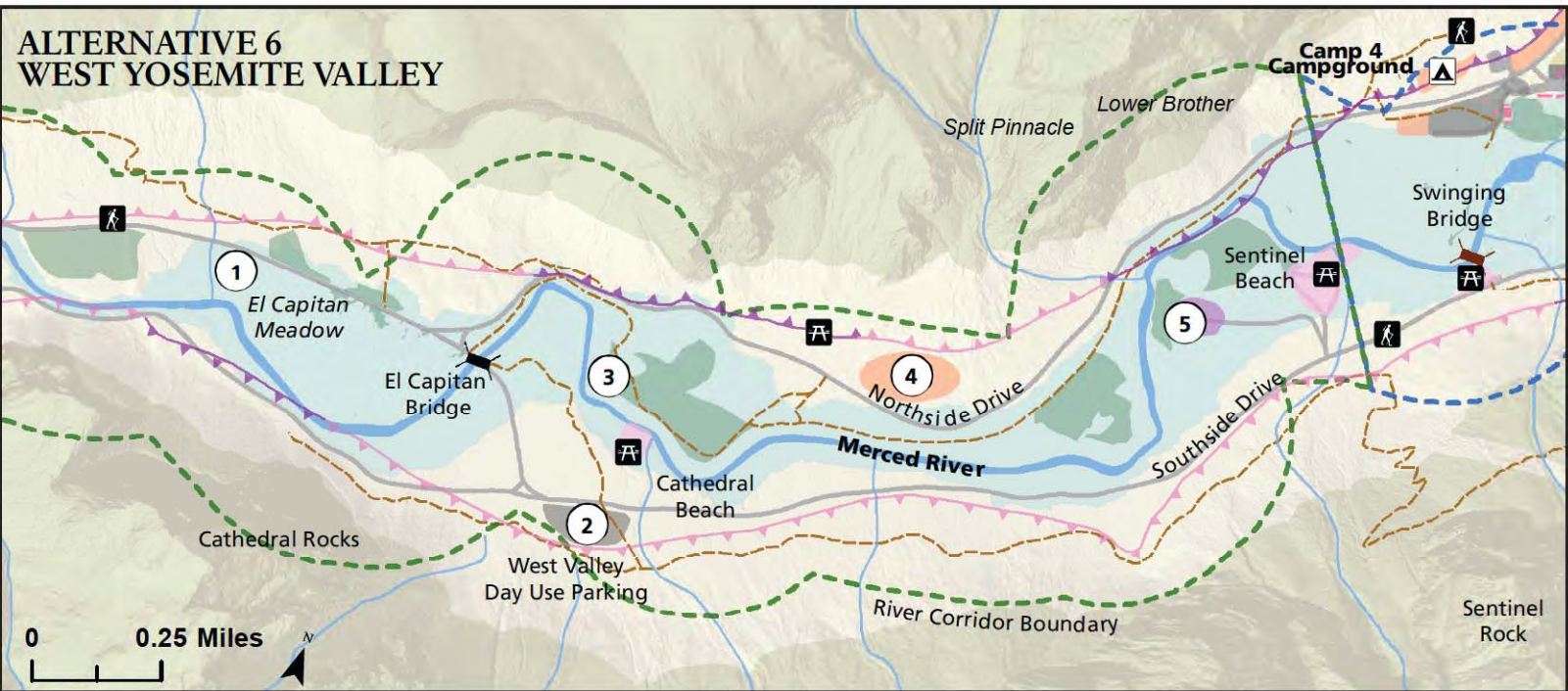


# ALTERNATIVE 6: DIVERSIFIED VISITOR EXPERIENCES AND SELECTIVE RIVERBANK RESTORATION



## EL PORTAL

- 1. Rancheria Flat**
  - Employee Housing: To replace temporary housing that will be removed from Yosemite Valley, construct three dormitories, with 12 employees each, and eight dwelling units for additional employees for a total of 44 employee beds, away from sensitive resources.
- 2. Abbieville and Trailer Court**
  - Abbieville and Trailer Village Housing: Construct high-density housing outside the 100-year floodplain for 258 employees. Remove or relocate 36 existing private residences.
  - El Portal Remote Visitor Parking: Construct a new visitor parking facility with 200 spaces. Transportation service will be provided by regional transit. Parking redevelopment will incorporate best management practices to protect water quality.
- 3. El Portal Village Center**
  - Valley Oak Restoration: Restore the rare floodplain community of valley oaks in Old El Portal through implementation of best management practices. Create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.
  - Odger's Fuel Storage Facility: Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompact soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.



## WEST YOSEMITE VALLEY

- 1. El Capitan Meadow Area**
  - Restoration of Informal Trails: Restore all informal trails in meadow to natural conditions. Use restoration fencing to prohibit all foot traffic into meadow, including the southern perimeter and designate all meadow access using boardwalks and viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside.
- 2. West Valley Overflow Parking**
  - Day-Use Parking: Develop a West Valley Overflow Parking area on the south side of Southside Drive, at the intersection of El Capitan Crossover, with 250 parking spaces. Parking development will incorporate best management practices to protect water quality. Expand Yosemite Valley shuttle service to West Valley locations.
- 3. Valley Loop Trail**
  - Re-Route: Move portions of the Valley Loop Trail out of sensitive areas; this includes the 780 feet of the trail through Bridalveil Meadow. Construct boardwalks through wet meadow habitat in Slaughterhouse Meadow.
- 4. Eagle Creek Campground**
  - New Campground: Construct campground with 79 car and RV sites located east of El Capitan Picnic Area.
- 5. Yellow Pine Campground**
  - Administrative Use Campground: Retain Yellow Pine's four group sites (serving up to 120 people) for administrative use.

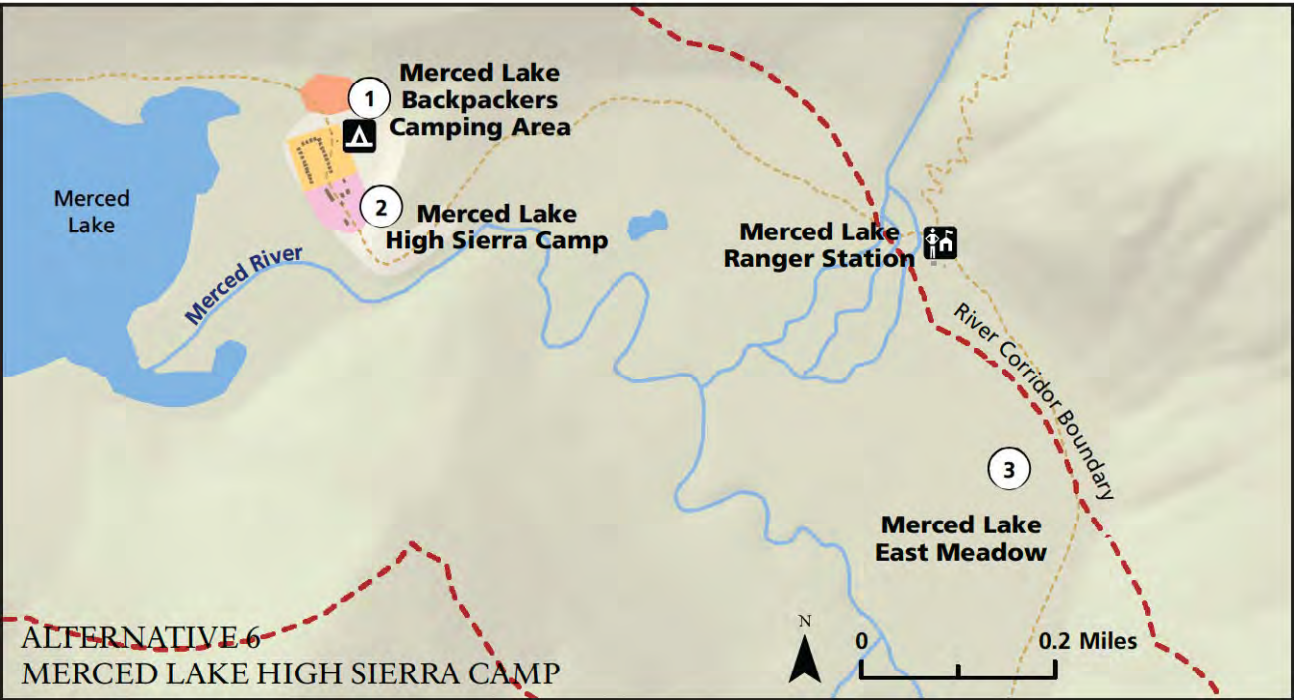
## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		



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# ALTERNATIVE 6: DIVERSIFIED VISITOR EXPERIENCES AND SELECTIVE RIVERBANK RESTORATION

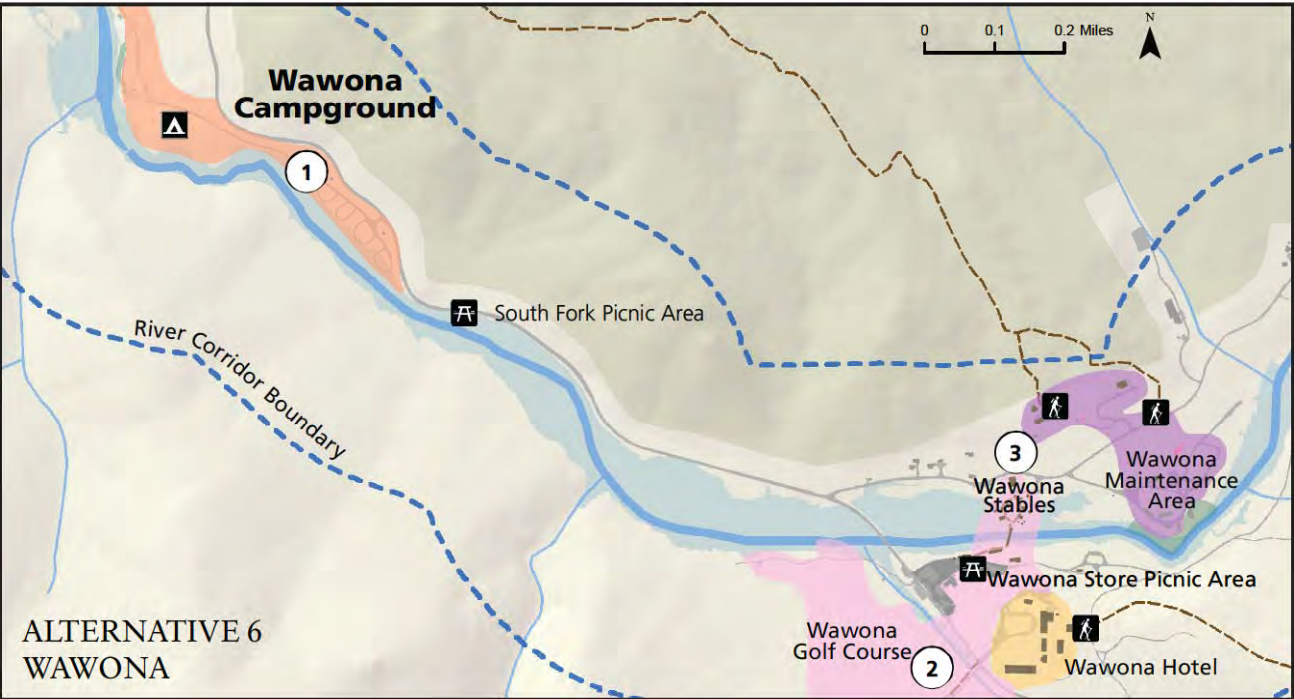


## MERCED LAKE HIGH SIERRA CAMP

1. Merced Lake Backpackers Camping Area: Retain the designated camping area. Replace flush toilets with composting toilets.
2. Merced Lake High Sierra Camp: Retain all 22 units (60 beds) at the existing lodging facility. Replace flush toilets with composting toilet.
3. Merced Lake East Meadow: Develop preliminary grazing capacities for the meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed to protect the meadow.

## OTHER SEGMENT 1 CAMPING AREAS

- Little Yosemite Valley: Continue designated camping in this camping area. Retain infrastructure, such as composting toilets.
- Moraine Dome: Continue designated camping in this camping area.



## WAWONA

1. Wawona Campground: Retain 83 campsites, and one group site. Remove 13 sites that are located within 100 feet of the river or in culturally sensitive areas.
2. Wawona Golf Course and Golf Shop: Retain the existing nine-hole golf course and golf shop retail and food service.
3. Wawona Stables: Eliminate stable operation and commercial day rides. Relocate two stock-use campground sites from sensitive resource area to existing stables area.

## Legend

Campgrounds	Calculated Rock-fall Hazard Line	Surfaced Areas	Buildings	Recreational Segment
Picnic Area	Inferred Rock-fall Hazard Line	Camping	Retain Building	Wild Segment
Parking Area	Lakes	Lodging	Remove Building	Scenic Segment
Trailheads	Stream	Visitor Services	Restoration Areas	
Road bridge	Contour	Housing	100-year Floodplain	
Footbridge	Trails	Operations	Designated Wilderness	
		Parking		

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## Detailed Description of Alternative 6 by Segment

### *Segment 1: Wilderness above Nevada Fall (Wild Segment)*

#### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 6 would include the following action to protect and enhance river values:

##### *Biological Values*

- Establish preliminary grazing capacities for Merced Lake East Meadow; monitor and adapt as necessary.

##### *Recreational Values*

- Retain current density of use at Little Yosemite Valley and Merced Lake designated camping areas.

#### **User Capacity, Land Use and Facilities Management**

Alternative 6 would provide for similar kinds and amounts of use as exist today in this segment. The kinds of use would continue to focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. In addition to the “Actions Common to Alternatives 2-6” (page 8-77), Alternative 6 would include the following actions to manage user capacity, land use, and facilities:

##### *Visitor Activities and Services*

Overnight use in this segment would include visitors staying at the Merced Lake High Sierra Camp and visitors backpacking and staying overnight either at designated camping areas or dispersed throughout the wilderness.

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Only 10 boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

Up to two overnight commercial groups per wilderness zone would be allowed in Segment 1.

##### *Visitor Overnight Capacity*

The current wilderness zone capacities would be retained (Table 8-49). Manage to a capacity of 150 in the Little Yosemite Valley Zone using a zone quota or zone pass through system. Services would be managed as follows:

- Retain the Merced Lake High Sierra Camp at its current capacity (60 people per night); convert the flush toilets at the camp to composting toilets.
- Retain designated backpacker camping areas at Little Yosemite Valley, Moraine Dome, and Merced Lake; remove the flush toilets from the Merced Lake Backpackers camping area and replace with composting toilets.

**Table 8-49: Wilderness Zone Capacities for Alternative 6**

Wilderness Zones	Alt 6 Zonewide Capacity	Alt 6 Zone Capacity Specific to the River Corridor
Little Yosemite Valley Zone	150 people	<b>150 people</b>
Merced Lake Zone	50	<b>50</b>
Washburn Lake Zone	150	<b>100</b>
Mount Lyell Zone	50	<b>10</b>
Clark Range Zone	50	<b>10</b>
* <b>Capacity Numbers:</b> No reductions from Alternative 1 (No Action) to Alternative 6		

### *Visitor Day-use Parking Capacity*

Day use access to this segment is addressed under “Actions Common to Alternatives 2-6.”

### *Administrative Activities*

- Continue current administrative activities, which consist primarily of regular ranger patrols and backcountry utility work as well as occasional trail/restoration crews. These activities are seasonal and minimal in comparison to visitor use and would not affect overall user capacity.

## *Segment 2: Yosemite Valley (Recreational and Scenic Segments)*

### **Actions to Protect and Enhance River Values**

In addition to the “Actions Common to Alternatives 2-6” (beginning on page 8-53), Alternative 6 would include the following action to protect and enhance river values:

#### *Free Flow*

- Retain Stoneman Bridge; mitigate the hydrological effects of the bridge by placing large wood on the riverbanks to address scouring, adding brush layering, and increasing channel complexity between Clarks Bridge and Sentinel Bridge (as described in Chapter 5 and Appendix E).
- Retain the Ahwahnee and Sugar Pine Bridges; mitigate the hydrological effects of the bridges by placing large wood on the riverbanks to address scouring, adding brush layering, and increasing channel complexity between Clarks Bridge and Sentinel Bridge (as described in chapter 5 and Appendix E).
- Reduce the width of the cut-off channel upstream of Sugar Pine bridge through a combination of fill, constructed log jams, and bioengineered bank stabilization; If subsequent monitoring of riparian condition reveals insufficient improvement (i.e., CRAM rating remains below 0.71, see Chapter 5) within 10 years of the implementation of these actions, consider more aggressive management action, including the possible removal of the Sugar Pine Bridge.

#### *Water Quality*

- Reroute the pack stock trail from the Curry Village stable farther north, adjacent to the Happy Isles Loop Road.

#### *Biological Values*

Alternative 6 would remove existing campsites within 100 feet of the ordinary high-water mark:

- Remove all existing campsites and associated infrastructure within 100 feet of the ordinary high-water mark and restore natural floodplain and riparian habitat (12 acres).
  - **Backpackers Camp:** Remove 15 sites within 100 feet of the ordinary high-water mark. (Replace all these sites to the west of the current campground.)
  - **North Pines Campground:** Remove 14 campsites from within 100 feet of the ordinary high-water mark; restore native riparian vegetation
  - **Lower Pines Campground:** Remove 5 sites from within 100' feet of the ordinary high-water mark; restore native riparian vegetation.
  - **Upper Pines Campground:** Retain 238 campsites, 22 of which are in the 100-year floodplain.
- **Former Lower and Upper River Campgrounds:** Remove abandoned facilities within 150 feet of the ordinary high-water mark and restore 19.7 acres of natural floodplain topography and riparian/wetland habitat; reestablish overflow channels where possible. Fence and close the riparian zone at former Upper River Campground to protect the riverbank from trampling; direct visitors to access the river for boating and swimming by way of a path to the Housekeeping Camp eastern beach.
- **Yosemite Lodge:** Remove all existing buildings at Yosemite Lodge and restore natural floodplain conditions. (Replace lodging and associated facilities with new structures outside the floodplain). Construct enough parking to park the lodging units and restore the remaining area.
- **Former Pine and Oak Units:** Redevelop the disturbed footprint of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Retain one service road to the well house.
- **Yosemite Village:** Move the Yosemite Village Day-use Parking Area northward so that it is 150 feet back from the ordinary high-water mark of the Merced River and outside a designated 50-foot setback from Indian Creek; remove fill material and restore the riparian habitat adjacent to the river.
- **Housekeeping Camp:** Remove lodging and other facilities at Housekeeping Camp out of the ordinary high-water mark (remove 34 units); restore native riparian habitat (12.2 acres). Adjust the existing fencing along the riverbank to protect the restored riparian habitat. Direct visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off the current eastern river access point located on a steep eroded bank, and actively restore the riverbank with brush layering.

Alternative 6 would remove or mitigate the effects of trails and roads through meadows:

- **Bridalveil Meadow:** Reroute the 780-foot segment of the Valley Loop Trail that currently crosses Bridalveil Meadow so that it is adjacent to Southside Drive.
- **Slaughterhouse Meadow:** Construct boardwalks through sensitive wet meadow habitat at Slaughterhouse Meadow.
- **El Capital Meadow:** Fence the northern and southern perimeters of the meadow to prohibit all foot traffic into the meadow, and designate all meadow access using boardwalks and viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside to discourage foot traffic into the meadow.
- **Ahwahnee Meadow:** Retain Northside Drive and bike path in current configuration; add culverts to improve hydrologic connectivity through Ahwahnee Meadow. Install a boardwalk to traverse wet areas through Ahwahnee Meadow (350 feet long).

- **Stoneman Meadow:** Retain Southside Drive through Stoneman Meadow as a necessary part of the traffic pattern under this alternative.

### *Cultural Values*

- Maintain all the collective sites representing the prominent historic patterns of development in Yosemite Valley in their current locations and in their current status.
- Rehabilitate Residence 1 per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) in its existing location to preserve the historic fabric while preparing the structure to withstand periodic flooding.

### *Recreational Values*

- Restrict boating to 150 people per day for private vessels and 100 boats at one time for commercial vessels. This reduction would promote the dispersal of recreation opportunities along the river corridor.
- Mitigate traffic congestion in East Yosemite Valley through intentional traffic management as well as the addition of remote parking lots with bus and shuttle access to Yosemite Valley destinations.

## **User Capacity, Land Use and Facilities Management**

### *Visitor Activities and Services*

Alternative 6 would enhance opportunities for visitors to connect to the river through both infrastructure improvements and expansion of opportunities. It would include the following changes in visitor activities and services in addition to those common to Alternatives 2-6 (see page 8-77):

- Allow both private and commercial boating in this river segment.
  - Allow private boats in the section of river between the Clarks Bridge and Pohono Bridge, with put-ins and take-outs below Clarks Bridge on river right, below Stoneman Bridge on river left, at Sentinel Beach, and along the roadside below Pohono Bridge. Restrict private boating use to 150 trips per day through a permit system; monitor use to ensure protection of river values.
  - Allow commercial boating between Stoneman Bridge and Sentinel Beach, with staging at the existing rental area at Curry Village. Limit commercial trips to 100 boats at one time (approximately 250 trips per day). Monitor commercial use through the existing concession contract.
- Improve the Cathedral, Sentinel, and Swinging Bridge picnic areas.
- Provide a new picnic area (8 tables and 20 parking spaces) and designated river access for rafting in the Lower River area.
- Retain the Housekeeping Camp shower houses, restrooms, laundry, and grocery store.
- Continue to provide staging at the Concessioner Stable for temporary pack camp operation at Merced Lake High Sierra Camp; retain kennel service.
- Retain Curry Village raft rental.

### **Visitor Overnight Capacity: Camping**

Camping would be significantly increased, while ensuring that this activity occurred in appropriate locations, protective of river values. Campsites in Yosemite Valley would total 739 sites accommodating 4,626 people:

- **Backpackers Camp:** Retain 10 walk-in sites. Remove 15 sites within 100 feet of the ordinary high-water mark. Construct 16 new walk-in campsites west of Backpackers Camp.
- **Former Upper River Campground:** Construct a new campground with 30 walk-in sites and 2 group sites, north of the river and a minimum of 150 feet away from the ordinary high-water mark. Construct a new campground with 40 walk-in sites at Lower River, 150 feet away from the ordinary high-water mark.
- **North Pines Campground:** Retain 72 campsites. Remove 14 sites from within 100 feet of the ordinary high-water mark.
- **Upper Pines Campground:** Retain 238 campsites. Construct a new RV campground loop with 36 RV sites. Construct a new walk-in campground with 49 individual sites and 2 group sites.
- **Lower Pines Campground:** Retain 71 campsites. Remove 5 sites from within 100 feet of the ordinary high-water mark.
- **Yosemite Lodge:** Construct a new campground with 20 RV sites near the parking area west of Yosemite Lodge
- **Camp 4:** Retain 35 walk-in campsites and 35 parking spaces. Construct 35 additional campsites east of Camp 4; establish a new parking area (41 spaces) for the Camp 4 campground expansion In the disturbed footprint of the former service station near Camp 4.
- **Eagle Creek:** Construct a new campground with 79 drive-in sites, including RV sites.

### **Visitor Overnight Capacity: Lodging**

Lodging would be increased to 1,248 units accommodating 4,380 people per night. Common to Alternatives 2-6, the Ahwahnee would continue to provide 123 lodging rooms. The following additional lodging would be retained, removed, or constructed under Alternative 6:

- **Curry Village:** Retain 355 lodging units at Curry Village: 290 tents, 18 units at Stoneman House, 47 hard-sided cabin with bath units. Remove all existing cabins and associated structures at Boys Town. Construct 98 new lodging units suitable for year-round use (25 duplex buildings, two 4-plex buildings, and five two-story 8-plex buildings, all with private baths); construct a new guest check-in building and pedestrian pathway; provide 78 new parking spaces along the existing roadway and 20 new parking spaces along the eastern edge of the Curry Orchard parking area, all within the existing developed footprint. Provide 450 designated overnight parking spaces at Curry Orchard.
- **Housekeeping Camp:** Retain 232 units and associated facilities. Remove 34 units out of the ordinary high water mark defined by the Army Corps of Engineers. Restore approximately 1 acre of riparian habitat. Adjust the existing fencing along the riverbank to protect the restored riparian habitat.

Conceptual site drawings for lodging improvements at Boys Town under Alternative 6 have been completed to allow the analysis of impacts of this potential project. See "Conceptual Designs for Potential Project Implementation" at the end of the Alternative 2 discussion for site details and design drawings.

- Yosemite Lodge: Remove all existing buildings, including 4 buildings in the 100-year floodplain). Construct new three- story-lodging structure(s with the pre-flood number of 440 units outside the 100-year floodplain.

### *Visitor Day-use Parking Capacity and Transit*

Alternative 6 would allow for increased maximum daily visitation in Yosemite Valley. The day parking, regional transit, and tour bus capacities would accommodate up to 9,449 day users at one time in Segment 2:

- Increase available day-use parking spaces (+261 spaces) for a total of 2,598 parking spaces accommodating a maximum of 6,781 people at one time.
- Accommodate an estimated 1,160 people at one time in circulation on Valley roads.
- Accommodate a maximum of 788 people at one time arriving to the Valley on regional transit.
- Retain tour bus parking at 15 spaces accommodating up to 720 people at one time.

Visitor circulation would be improved to reduce traffic congestion and to provide a better arrival experience for visitors. Major actions would include the following:

- Redesign day parking at Yosemite Village to provide 850 formal parking spaces and a new comfort station.
- Construct a parking lot with 300 designated day parking spaces and a new 3,000 square foot comfort station west of Yosemite Lodge; provide 15 bus loading/unloading spaces.
- Construct a new parking lot to accommodate overflow parking for 250 vehicles south of Southside Drive; expand Yosemite Valley shuttle service to West Valley.

Conceptual site drawings for the Yosemite Village Day-use Parking Area and the new parking lot west of Yosemite Lodge have been completed to allow the analysis of impacts of these potential projects. See "Conceptual Designs for Potential Project Implementation" at the end of the Alternative 6 discussion for site details and design drawings.

Day users would also be able to access the Valley by parking in the new El Portal remote parking area (200 parking spaces) and taking a shuttle to the Valley.

An East Valley day-use parking permit system would be implemented when conditions reached the point where day use visitation to the East Yosemite Valley from private vehicles exceeds the parking availability and formal traffic diversions at El Capitan Crossover are instituted for 14 days or more during the summer season for 2 consecutive years.

Regional transit service into Yosemite Valley during the peak summer season would be expanded to accommodate a maximum of 788 people at one time in Yosemite Valley.

- Highway 140 (Merced to Yosemite Valley): Maintain service at 12 runs per day. Add a stop at the El Portal remote day-use parking area.
- Highway 41 between Fresno and Yosemite Valley: implement new public transit service at 12 runs/day.
- Implement a dedicated shuttle to Badger Pass for transfer shuttle to Glacier Point.
- Highway 120 West (Groveland to Yosemite Valley: Reduce service to 8 runs per day (summer only).
- Highway 120 East (Mammoth Lakes to Yosemite Valley): Increase service to 2 runs per day (summer only)



Under all the action alternatives, including Alternative 6, shuttle bus service would be improved by increasing the frequency of the year-round East Valley service to 5 minute intervals during peak use. The Visitor Center Express shuttle service (summer only) would be improved by increasing the frequency to 7 minute intervals between buses. Shuttle service would be expanded as follows:

- Expand Valley Shuttle service to Bridalveil (summer only) with 30-minute interval between buses and stops at El Capitan picnic area, El Capitan Meadow, Bridalveil Fall straight, Cathedral Beach, Yellow Pine, and Four-mile/Swinging Bridge.

**TABLE 8-50: TRANSIT OPTIONS- ALTERNATIVE 6**

Regional Transit Options	
HWY 140 Merced/Mariposa to Yosemite Valley	12 runs per day Additional stop at the El Portal remote day-use parking area (year round)
HWY 41 Fresno/Oakhurst to Yosemite Valley	12 runs per day Dedicated shuttle to Badger Pass as collection point for shuttle to Glacier Point
HWY 120 West Groveland/Sonora to Yosemite Valley	8 runs per day (summer only)
HWY 120 East Inyo/Mono County (Mammoth Lakes) to Yosemite Valley	2 runs per day (summer only)
Yosemite Valley Shuttle Options	
East Yosemite Valley	5 minute peak interval between buses Year round except Visitor Center direct
Visitor Center Express Yosemite Valley Day-use Parking Area to Visitor Center	7 minute interval between buses (summer only)
El Capitan Crossover	15 minute interval between buses (summer only)
West Yosemite Valley	Expand Valley Shuttle service to Bridalveil (summer only) 30-minute interval between buses Stops at El Capitan picnic area, El Capitan Meadow, Bridalveil Fall straight, Cathedral Beach, Yellow Pine, and Four-mile/Swinging Bridge

### ***Administrative Activities***

Some administrative activities would be relocated:

- Relocate the Yosemite Lodge housekeeping and maintenance facilities to a location behind the Yosemite Lodge cafeteria.

### ***Employee Housing and Employee Parking***

Compared to existing conditions, 179 fewer concessioner employees would be housed in Yosemite Valley. The remaining housing for 972 concessioner employees would be provided as follows:

- Retain housing for 42 employees at the Ahwahnee Hotel.
- Provide housing for 436 employees at Curry Village.

## ALTERNATIVES

- Retain permanent housing in the Curry Village residential area (223 employees)
  - Retain housing at Curry Village stable (49 beds).
  - Construct 16 buildings housing 164 employees.
- Provide housing for 390 employees at Yosemite Village:
  - Retain permanent housing at Indian Creek, Lost Arrow, and Upper Tecoya (65 employees)
  - Retain Ahwahnee Row, Y Apartments, garage housing, and Hospital Row (43 employees)
  - Retain Tecoya Dorms (232 employees)
  - Construct new housing at Lost Arrow (50 employees)
- Provide housing for 104 employees at Yosemite Lodge:
  - Construct new housing for 104 employees at Yosemite Lodge (two structures with 26 double-occupancy units each)

Four group administrative campsites (up to 120 people) would be retained at the Yellow Pine Administrative Campground.

An additional 314 Valley employees would be housed in El Portal.

### ***Segment 3: Merced Gorge (Scenic Segment)***

#### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 3 for Alternative 6 are included in the “Actions Common to Alternatives 2-6” (page 8-53).

#### **User Capacity, Land Use and Facilities Management**

This alternative would provide for similar kinds and amounts of use that exist today. The majority of actions for Alternative 6 in Segment 3 are discussed in the “Actions Common to Alternatives 2-6” (pages 8-77). Alternative actions that are not included in the Actions Common section are listed below.

#### ***Visitor Activities and Services***

Boating would not be allowed in this segment under Alternative 6 due to the safety concerns associated with accessing the river for search and rescue operations during high use periods. This section of river is steep and rocky, and boatable only by the most advanced paddlers.

#### ***Transit Options***

Public transit options along this segment would be expanded as described in the Yosemite Valley segment (see Segment 2 above). This river segment is considered a “pass through” segment and therefore it does not contain any stops for passengers to enter or depart from transportation services that travel along this corridor.

## ***Segment 4: El Portal (Scenic Segment)***

### **Actions to Protect and Enhance River Values**

All actions to protect and enhance river values in Segment 4 for Alternative 6 are addressed in “Actions Common to Alternatives 2-6” (see page 8-53).

### **User Capacity, Land Use and Facilities Management**

Alternative 6 would introduce additional visitor use to this segment in addition to expanding employee housing capacity.

#### ***Visitor Activities and Services***

Most visitor activities and services in Segment 4 are considered in “Actions Common to Alternatives 2-6” (page 8-77) Additional actions would include:

- Allow unrestricted private boater use in Segment 4. Expected use would be mostly rafts and kayaks. Boaters would be permitted below Yosemite View Lodge to beyond the Foresta Bridge, at which point boaters would exit the segment. Boaters would be able to use put-ins and take-outs below the hotel, at the store/gas station and the Red Bud launch site.

#### ***Visitor Overnight Use***

No visitor overnight accommodations on NPS lands are proposed in Alternative 6.

#### ***Visitor Day Use Capacity***

Visitor day-use parking would be expanded at El Portal under Alternative 6. A new remote visitor day-use parking area accommodating a maximum of 200 vehicles would be provided at the Abbieville site. This parking area would primarily be used for visitor access to Yosemite Valley. The use associated with this parking area is accounted for in the Valley daily visitation levels reported above.

The total available day-use parking capacity in this segment would be 414 spaces. 214 of these spaces are for visitors to El Portal and 200 spaces are for visitors to Yosemite Valley (or other Yosemite destinations).

#### ***Administrative Activities***

Administrative activities in Segment 4 are considered in “Actions Common to Alternatives 2-6” (page 8-53).

#### ***Employee Housing Capacity***

Employee housing would increase in El Portal under Alternative 6. Multi-cluster dormitories would be added to Abbieville with 258 beds. Rancheria would add new duplex units with a total of 8 beds and new dormitories with 36 beds. Duplex units would be added to El Portal Village Center with 12 beds. All new buildings would be high density and outside of the 100 year flood plain. These units would be added to accommodate for the temporary housing units removed from Segment 2.

#### ***Employee and Administrative Parking Capacity***

Most employee and administrative parking actions are discussed in “Actions Common to Alternatives 2-6” (page 8-53). Additionally, under Alternative 6, 44 parking spaces would be added with the Rancheria

housing expansion, 12 parking spaces would be added with the El Portal housing expansion and 258 parking spaces would be added for residents of the new Abbieville site.

### ***Transit Options***

Public transit options along this segment's travel corridor are expanded under this alternative. Buses would also stop at the new day-use parking area at Abbieville. Bus service would be provided on a 30 minute interval during peak use season and run directly to Yosemite Valley. For a complete summary of the transit option along this corridor see the Segment 2 summary above.

## ***Segment 5: South Fork Merced River Above Wawona (Wild Segment)***

### **Actions to Protect and Enhance River Values**

There are no actions in Segment 5 in addition to what is proposed under "Actions Common to Alternatives 2-6" (page 8-53).

### **User Capacity, Land Use and Facilities Management**

Alternative 6 would provide for similar kinds and amounts of use that exist today in Segment 5. The majority of actions for Alternative 6 in Segment 5 are discussed in the "Actions Common to Alternatives 2-6: User Capacity, Land Use and Facilities Management", (page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Only 10 boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

### ***Visitor Day Use Capacity***

Day-use parking for the trailheads that lead to this segment is included in the Wawona area (see Segment 7, below). Other users may access this segment from trailheads that originate in the Sierra National Forest south of this segment, but this use is minimal. Otherwise, very little day use occurs along this segment.

### ***Transit Options***

Specific transportation options for reaching Segment 5 trailheads are listed below under Segment 7.

## ***Segments 6 and 7: Wawona and Wawona Impoundment (Recreational Segments)***

### **Actions to Protect and Enhance River Values**

In addition to the "Actions Common to Alternatives 2-6" (see page 8-53), protection and enhancement of cultural values and water quality would be accomplished through the actions described below.

### ***Cultural Values/Water Quality***

- Wawona stock campground: Relocate stock campground (two sites) from culturally-sensitive area to the Wawona Stables area.
- Wawona Campground: Remove 13 sites that are either within the 100-year floodplain or in culturally sensitive areas.

### **User Capacity, Land Use and Facilities Management**

Overall, this alternative would provide for similar kinds and amounts of use that exist today in the Wawona area. The majority of actions for Alternative 2 in Segment 7 are discussed in the “Actions Common to Alternatives 2-6” (page 8-77). Alternative actions that are not included in the Actions Common section are listed below.

#### ***Visitor Activities and Services***

Most visitor activities and services in Segment 7 are considered in “Actions Common to Alternatives 2-6” (see page 8-53) Additional actions are listed below:

- Discontinue commercial day rides.

#### ***Visitor Overnight Use***

- Reduce the Wawona Campground capacity to 84 sites (including one group site) which would accommodate up to 528 people per night. The two campsites at the Wawona stock camp would be relocated to the Wawona stables and would accommodate 6 people per night each site (12 people per night total).
- Total overnight capacity for Wawona would be 787 people.

#### ***Transit Options***

Transit options would be expanded in Alternative 6. Regional bus service, similar to that provided on the Highway 140 corridor, would be introduced on Highway 41. A maximum of 12 runs per day would be made between Fresno and Yosemite Valley using 48-passenger buses. A maximum of 311 people at one time would arrive to Segment 7 by way of regional transit. Additionally, the Wawona area shuttle would continue, serving the key destinations within this segment along with the Mariposa Grove of Giant Sequoias. Finally, up to 2 concession operated runs per day would be made between Wawona and Yosemite Valley.

### ***Segment 8: South Fork Merced River Below Wawona (Wild Segment)***

#### **Actions to Protect and Enhance River Values**

There are no actions in Segment 8 in addition to what is proposed under “Actions Common to Alternatives 2-6” (page 8-53).

#### **User Capacity, Land Use and Facilities Management**

Alternative 6 would provide for similar kinds and amounts of use that exist today in Segment 8 and significant changes are not proposed. The majority of actions for Alternative 6 in Segment 8 are discussed in



the “Actions Common to Alternatives 2-6” (pages 8-77). Alternative actions that are not included in the Actions Common section are listed below.

### ***Visitor Activities and Services***

Private boating would be allowed in this segment. Generally, use in this segment would consist of short floats using pack raft or other craft that can easily be carried into this remote area. Only ten boats per day would be allowed, and a permit would be required. The boating permits would be administered by and linked to the overnight backcountry permits.

### ***Transit Options***

Transit services for access to this segment are described above under Segment 7.

## **Analysis of Facilities and Services**

Table 8-51 presents the park’s assessment of the particular facilities and services that would be needed to support public use and/or to protect river resources based on the types, levels, and locations of use proposed for Alternative 6. As an example, the goals of this alternative include diversified visitor experiences and selective riverbank restoration. This alternative prescribes restoration within 100 feet of the Merced River and would allow for some increase in peak visitor use levels. It provides the most visitor services and facilities, by having the most overnight accommodations, parking and visitor services, therefore making it necessary for expanding overnight accommodations at the Yosemite Lodge, providing additional camping at Upper and Lower River Campgrounds, and providing additional overflow parking for East Yosemite Valley near El Capitan Crossover as well as expanded parking at the Yosemite Lodge Area.

**TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 1: Wild</b>			
Merced Lake High Sierra Camp	Retained	<b>Yes:</b> This facility offers rustic accommodations to visitors traveling independently or as a part of the organized High Sierra Loop Trip offered by the concessioner in cooperation with the NPS. The number of camp beds allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No:</b> The High Sierra Camp is outside designated Wilderness; however it is surrounded by designated wilderness. Designated wilderness precludes the construction of new facilities such as this. Alternatives in Chapter 8 consider various means of addressing impacts to ORVs.
Merced Lake Backpackers Camping Area	Retained	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to allow support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Little Yosemite Valley Camping Area	Retained	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
Moraine Dome Camping Area	Retained	<b>Yes:</b> This undeveloped campground is used by backpackers. Backpacking is a component of the recreational ORV in this segment. This campground is necessary to support overnight wilderness use. Designated camping protects resources in popular areas from radiating impacts by limiting camping to the designated area.	<b>No:</b> A designated campground reduces resource impacts from dispersed camping. Alternatives in Chapter 8 consider various mitigations for the existing campground.
<b>Segment 2: Curry Village and Campgrounds</b>			
Upper Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Lower Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
North Pines Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Backpackers Campground	Reduced and partially re-located	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience. In addition, this campground provides is critical for backpackers who need to start or end their wilderness trip in Yosemite Valley.	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.

**TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Valley Campground Reservation Center	Retained	<b>Yes:</b> The Valley Campground Reservation Center is an essential National Park Service point-of-contact for campers, and those who seek campsites, in Yosemite Valley. The Campground Reservation Center staff sells campsite reservations for all campsites in the park available for reservations. The Reservation Center is operated on a year-round basis.	<b>Yes.</b> The Campground Reservation could be moved from its existing location. However, it is important to the successful delivery of services provided from the reservation center that any alternative location be near the Valley campgrounds.
Housekeeping Camp Lodging Units	Reduced	<b>Yes:</b> Housekeeping Camp offers rustic overnight guest accommodations for visitors who do not or are unable to camp. The number of units allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> No alternative areas of sufficient size to accommodate this lodging facility (adjacent to the river, which is an integral part of the overnight experience )are available for development in Yosemite Valley
Housekeeping Camp Laundry	Retained	<b>Yes:</b> The public laundromat at Housekeeping Camp is a small facility that supports visitor use. The nearest public laundry facilities outside the park are located 50 miles from Yosemite Valley. Visitors spending multiple nights in the park frequently need to launder their clothing, and, in some cases, sleeping bags, blankets or other outdoor items.	<b>No.</b> This service is provided for Housekeeping Camp guests and is directly linked to the camp; relocating the service and providing a general laundry facility for park visitors is not necessary.
Housekeeping Camp Shower Houses and Restrooms	Retained	<b>Yes:</b> Public restrooms are needed in many areas throughout the river corridor to comply with public health regulations and meet the basic personal needs of visitors and employees. The public showers at Housekeeping Camp are provided for guest use as well as other patrons, including campers and hikers.	<b>No.</b> The Housekeeping Camp restrooms and shower houses are components of the overnight guest accommodations at this location. They are required to be located within or very near the overnight sleeping units.
Housekeeping Camp Grocery	Retained	<b>No:</b> This need for the grocery store is tied to the level of lodging units at Housekeeping Camp. With a reduction of lodging, the grocery store is not needed.	<b>Yes.</b> The merchandise offered at this location is offered elsewhere in Yosemite Valley.
Camp Curry Overnight Parking	Retained	<b>Yes:</b> Parking at Curry Village is needed to support the day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Orchard Parking Area	Re-developed	<b>Yes:</b> Parking at Curry Village Orchard is needed to support day and overnight visitors who use Curry Village.	<b>No.</b> Parking areas of in these locations are needed to support overnight guests at this location.
Curry Village Lodging and Shower Houses	Expanded	<b>Yes:</b> Curry Village offers rustic and economy overnight guest accommodations consistent with the types and amounts of visitor use that have been found to be protect and enhance ORVs. This facility is needed to support public use by visitors who do not camp.	<b>No.</b> This lodging facility is part of a National Register Historic District. It is not feasible to relocate the complex, including shower and toilet facilities needed by guests in without-bath accommodations, to locations outside the river corridor.
Curry Village Raft Rental	Retained	<b>No:</b> This is not a vital visitor service under this alternative.	<b>No.</b> By its very nature, the raft rental facility should be located within the river corridor.
Concessioner Stables	Retained (but day rides eliminated)	<b>Yes:</b> The stable operation at Curry Village supports the High Sierra Camp operations. The location of the stables is within reach of each of the high sierra camps by one day's ride and trailering stock from El Portal or Wawona would be a substantial operational burden due to time and distance required to reach trailheads.	<b>No.</b> There are no other suitable locations for a stable operation, neither in proximity to other visitor services nor proximity to the Valley trail system used to access the Merced Lake High Sierra Camp.

TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Concessioner Stables Employee Housing Area	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Retained	<b>Yes:</b> This road is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that connects all major visitor service nodes. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway from its present location.
Southside Drive (through Stoneman Meadow)	Retained	<b>Yes:</b> This road is needed to support public use of the river corridor. It is a component of the primary transportation & circulation road system that connects all major visitor service nodes. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway from its present location.
Sugar Pine Bridge	Retained	<b>No.</b> Under this alternative removal of this facility is consistent with land use restoration goals, and pedestrian and bicycle traffic would be re-routed north of river.	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Ahwahnee Bridge	Retained	<b>Yes:</b> This pedestrian, bicycle, and emergency vehicle bridge is needed to support public use of the river corridor. It allows safe crossing of the Merced River so that visitors can access points of interest in Yosemite Valley. Pedestrian and bicycle bridges also protect riparian habitat from destruction caused by random crossings throughout the river corridor. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Stoneman Bridge	Retained	<b>Yes:</b> This pedestrian, bicycle, and emergency vehicle bridge is needed to support public use of the river corridor. It allows safe crossing of the Merced River so that visitors can access points of interest in Yosemite Valley. Pedestrian and bicycle bridges also protect riparian habitat from destruction caused by random crossings throughout the river corridor. It is also used for by NPS for law enforcement and fire protection	<b>No.</b> It is not feasible to relocate the existing roadway and bridges from their present location given the circulation system for Yosemite Valley.
Upper Pines RV and Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Former Upper River Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.

**TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Curry Village and Campgrounds (cont.)</b>			
Former Lower River Walk-in Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Yosemite Lodge Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
Eagle Creek Campground (New)	Constructed	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience	<b>No.</b> No alternative areas of sufficient size or location (adjacent to the river, which is an integral part of the camping experience) could accommodate this campground in Yosemite Valley.
<b>Segment 2: Yosemite Village and Housekeeping Camp</b>			
Ahwahnee Row Employee Housing	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lower Tecoya Employee Housing Area	Retained	<b>Yes:</b> This housing facility is necessary to accommodate a employees who provide visitor services that are consistent with the types and amounts of visitor use that have been found to protect and enhance river values.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Lost Arrow Employee Housing Area	Removed and replaced with permanent housing	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services consistent with the land use restoration and visitor experience goals of this alternative.	<b>No.</b> There are no other suitable locations to move employee housing to in Yosemite Valley both in terms of size of these facilities and the need for them to be proximate to guest services to accommodate shift work schedules.
Roundabout at Intersection of Northside Drive and Village Drive (at Yosemite Village Day-use Parking Area) (New)	Constructed	<b>Yes:</b> Planned components of the primary transportation & circulation road system that connects all major visitor service nodes.	<b>No.</b> No changes are proposed for the existing road system in Yosemite Valley. Improvements for this location are required to increase efficiency of transportation circulation.



**TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Village and Housekeeping Camp (cont.)</b>			
Pedestrian Underpass at Northside Drive and Village Drive (at Yosemite Village Day-use Parking Area) (New)	Constructed	<b>Yes:</b> A pedestrian underpass is vital to reduce pedestrian and vehicle conflicts at this extremely busy intersection area. The pedestrian underpass would connect the majority of the day-use parking spaces with the main visitor services core area in Yosemite Village without requiring westbound traffic on Northside Drive to stop and allow pedestrians to cross the road.	<b>No.</b> No changes are proposed for the existing road system in Yosemite Valley. Improvements for this location are required to increase efficiency of transportation circulation.
Bank 3-way Roundabout (New)	Constructed	<b>Yes:</b> Planned components of the primary transportation and circulation road system that connects all major visitor center nodes	<b>No.</b> No changes are proposed for the existing road system in Yosemite Valley. Improvements for this location are required to increase efficiency of transportation circulation
Yosemite Village Day-use Parking Area	Re-developed and expanded	<b>Yes:</b> This facility will serve as the primary day-use parking lot for Yosemite Valley because it is proximate to numerous visitor services including the primary visitor center, museum, and the Valley shuttle. A day-use visitor parking area of this size is needed to support the level of public use that has been found to protect and enhance river values.	<b>No.</b> While some changes to the exact location of the parking lot and road system leading to the parking lot could be feasibly relocated, the parking lot could not be removed in its entirety unless a suitable replacement that would accommodate high volume visitor parking in Yosemite Valley is identified.
Residence 1 (Superintendent's House)	Retained	<b>Yes.</b> This historic structure is a component of the Historic Resources ORV and would be rehabilitated and used to support the visitor experience.	<b>No.</b> Under this alternative the facility must remain in its present location to remain a component of the Historic Resources ORV, given its siting and location contribute to the integrity of this historic property per its nomination to the National Register of Historic Places.
<b>Segment 2: Yosemite Lodge and Camp 4 Area</b>			
Yosemite Lodge Overnight Units	Removed and expanded infrastructure constructed	<b>Yes:</b> Yosemite Lodge offers mid-scale and economy overnight guest accommodations for visitors who do not or are unable to camp. The number of units allowed under this alternative are needed to support public use in a manner that is consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs.	<b>No.</b> While some buildings within the Yosemite Lodge complex could be relocated to sites further north of the Merced River, however, it is not feasible to consider a wholesale relocation of the complex to an alternative location.
Yosemite Lodge Overnight Parking	Re-developed	<b>Yes:</b> Parking is needed to support visitors who stay at Yosemite Lodge. Parking is also needed for park partner organizations and NPS staff who use the Lodge's meeting and interpretive spaces (i.e., the Cliff Room, Gardner Terrace, and the outdoor amphitheater).	<b>No.</b> As long as visitor services are provided at Yosemite Lodge, it will be necessary to provide parking near the Lodge complex.
Yosemite Lodge Garden Terrace and Cliff Room	Retained	<b>Yes:</b> These areas are used for interpretive programs and for training courses, meetings, and special events. These facilities are vital to National Park Service and park partner operations.	<b>No.</b> The Garden Terrace and Cliff Rooms are within the existing buildings at the Yosemite Lodge complex. The activities taking place at these locations could be considered for relocation to alternative facilities; however, it is not feasible to consider removing the buildings in their entirety.

**TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: Yosemite Lodge and Camp 4 Area (cont.)</b>			
Yosemite Lodge Gift and Grocery (Convenience Shop)	Reduced	<b>Yes:</b> The facility provides visitors a limited range of merchandise including packaged and fresh groceries, sundries, and outdoor products frequently needed by campers and hikers.	<b>No.</b> The building currently housing the Yosemite Lodge Gift and Grocery Store is part of the Yosemite Lodge food service and retail structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Mountain Room Bar & Food Service	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room Bar is part of the Yosemite Lodge food service structure and would be infeasible to relocate.
Yosemite Lodge Mountain Room Restaurant	Retained	<b>Yes:</b> Food services are necessary to support day visitors and those overnight visitors who are staying in lodging units without kitchenettes.	<b>No.</b> The building currently housing the Mountain Room restaurant is part of the Yosemite Lodge food service structure and would be infeasible to relocate. However, the merchandise offered for sale from this facility could be relocated to other retail outlets in Yosemite Valley if sites outside the river corridor are identified.
Yosemite Lodge Highland Court Employee Housing (Existing and New)	Replaced with permanent housing proximate to current location	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
Yosemite Lodge Employee Housing (Thousands Cabins) (Existing)	Removed and relocated (incorporated into permanent housing above)	<b>Yes:</b> This housing facility is necessary to house employees who provide visitor services at the Yosemite Lodge complex that are consistent with the types and amounts of visitor use that have been found to protect and enhance ORVs. Employee housing proximate to work site are vital given the demand for shift-workers and to reduce inter-Valley commuting.	<b>No.</b> The employees who are accommodated at this facility work at the Yosemite Lodge and need to be collocated for operational efficiencies.
Yosemite Lodge Day-use Parking (New)	Constructed	<b>Yes:</b> This facility will serve as a critical day-use parking lot for Yosemite Valley because substantial numbers of roadside parking spaces adjacent to meadows will be removed in the vicinity of the Yosemite Village Day-use Parking Area. This new parking area will serve as trailhead parking for the upper and lower Yosemite Falls trail, and overflow evening parking for Camp 4 Campground. It will also be used for the Wauhoga Cultural Center.	<b>No.</b> No alternative areas of sufficient size or location proximate to upper and lower Yosemite Falls trailhead, Wauhoga, Camp 4 and the Yosemite Lodge could accommodate this parking area.
Yosemite Falls Pedestrian Underpass (New)	Constructed	<b>Yes:</b> A pedestrian underpass is vital to reduce pedestrian and vehicle conflicts at this extremely busy intersection area. The pedestrian underpass would connect the pedestrians from the Yosemite Lodge Area to the Lower Yosemite Fall Area without requiring westbound traffic on Northside Drive to stop and allow pedestrians to cross the road.	<b>No.</b> No changes are proposed for the existing road system in Yosemite Valley. Improvements for this location are required to increase efficiency of transportation circulation.

TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 2: West Yosemite Valley</b>			
West Valley Overflow Parking Area (New)	Constructed	<b>Yes:</b> This parking area will provide a vital queuing and staging area during peak use periods when congestion in the East Yosemite Valley reaches conditions whereby the National park Service would not permit more vehicles to add to the crowding. Visitors would have a choice to either use El Capitan Cross-over and visit other areas of the park, or wait until outbound traffic has reduced congestion in the East Yosemite Valley.	<b>No.</b> There are no other suitable locations (i.e., near the intersection of North- and Southside Drives with the El Capitan Crossover) that allow for the redirection of vehicle traffic entering east Yosemite Valley.
Yellow Pine Administrative	Retained	<b>Yes:</b> This administrative camping area is used by volunteers and researchers whose work is critical to meeting the NPS mission.	<b>No.</b> No alternative areas of sufficient size or location could accommodate this campground.
<b>Segment 4: El Portal</b>			
Rancheria Employee Housing Area (New)	Constructed	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services.	<b>No.</b> In-fill employee housing should occur within existing employee housing areas
El Portal Remote Parking at Abbieville / Trailer Village (New)	Constructed	<b>Yes:</b> This parking area will provide a vital queuing and staging area during peak use periods when congestion in the East Yosemite Valley reaches conditions whereby the National park Service would not permit more vehicles to add to the crowding. Day-use visitors would be provided shuttle service to Yosemite Valley from this location.	<b>No.</b> There are no other suitable locations proximate with direct access to Highway 140 before entering Yosemite National Park boundary.
Abbieville / Trailer Village Employee Housing (New)	Constructed	<b>Yes:</b> Housing facilities to accommodate a portion of the workforce necessary to provide visitor services.	<b>No.</b> In-fill employee housing should occur within existing employee housing areas
<b>Segment 5 (Wild), Segments 6 &amp;7 (Recreational), Segment 8 (Wild)</b>			
Wawona Campground	Reduced	<b>Yes:</b> Camping is a component of the recreational ORV in this segment. Campgrounds are necessary to provide overnight opportunities that connect visitors with a direct outdoor experience.	<b>No.</b> This campground could not be relocated as no suitable alternative site exists in the Wawona proper adjacent to the river, which is an integral part of the camping experience.
Wawona Hotel Tennis Court	Retained	<b>Yes:</b> This visitor activity is a component of the Wawona Hotel NHL. Opportunities for this type of visitor recreation are unique in terms of setting attributes and the historic setting of the district.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.
Wawona Hotel Golf Course & Shop	Retained	<b>Yes:</b> This visitor activity is a component of the Wawona Hotel NHL. Opportunities for this type of visitor recreation are unique in terms of setting attributes and the historic setting of the district.	<b>No.</b> The Wawona Hotel and its surrounding buildings, lawn, swimming tank, golf course are listed on the National Register of Historic Place. Their locations are integral to their historic significance that would be diminished by any relocation outside the river corridor.

**TABLE 8-51: NECESSITY OF MAJOR PUBLIC-USE FACILITIES AND SERVICES- ALTERNATIVE 6**

Site Planning Area	Action	Justification: Is the Facility Needed for Public Use or Resource Protection?	Feasibility: If facility or services is necessary, is it feasible to relocate outside of the river corridor?
<b>Segment 5 (Wild), Segments 6 &amp; 7 (Recreational), Segment 8 (Wild) (cont.)</b>			
Wawona Stables	Retained	<b>Yes:</b> The Wawona Stables offer visitors commercial equestrian day rides to points of interest in the Wawona area. This facility is necessary to support horseback riding, which is a type of use that has been found to be consistent with the protection and enhancement of river values.	<b>No.</b> The stable operates from a historic structure that could not be feasibly relocated.
Wawona Commercial Horseback Day Rides	Eliminated	<b>No:</b> Not considered a vital visitor service under this alternative.	<b>N/A:</b> This service will be eliminated.

## Conceptual Site Drawings

### *Boys Town*

In Alternative 6, the existing Boys Town cabins and facilities would be removed and replaced with 98 new lodging units suitable for year-round accommodations. This would consist of 25 duplex buildings, two 4-plex buildings, and five 2-story 8-plex buildings. A new 2,840 foot long pedestrian pathway, a guest check in building, 78 new parking spaces along the existing roadway, and 20 new parking spaces along the eastern edge of the Orchard Parking lot would also be constructed within the existing developed footprint. The Curry Orchard Day-use Parking Area would be formalized using best management practices to have a total of 430 parking spaces. New ground disturbance within the existing 8.4 acre footprint of Boys Town would include approximately 33,000 square feet for new buildings, 56,800 square feet of utility trenching, 14,200 square feet for pedestrian pathways, and 29,400 square feet of new parking for a total of 3 acres. Construction staging would require an area of approximately 1.4 acres and would likely take place within the existing Orchard Parking Area.

### *Yosemite Village Day-use Parking Area*

In Alternative 6, the existing 6-acre informal parking area would be moved 150 feet north from the high water mark of the river to facilitate riparian restoration goals and to prevent further resource damage. Restoration actions would remove non-native fill material, re-contour the topography, and plant native vegetation. The redesigned parking area would be formalized to provide a total of 850 parking spaces and a new comfort station. A pedestrian underpass and two roundabouts (one at the Village Drive/Northside Drive intersection and one at the Sentinel Drive/Northside Drive intersection) would be constructed in conjunction with improved pedestrian pathways which would address overall circulation at the site. The Concessioner General Office, Valley Garage, and Arts and Activities Center (former bank building) would be removed and the Village Sport Shop repurposed to a visitor contact station.

The area of disturbance for improvements at Camp 6 in Alternative 6 would cover approximately 27.5 acres and include 19 acres of clearing and grubbing, 1.2 acres for existing building removal, 4,000 square feet for the new comfort station, 5.4 acres of pavement removal, 2.6 acres of new roadway, 8.3 acres for new parking, 15,220 square feet of utility service trenching, 43,350 square feet for new pedestrian pathways, and 55,000 square feet for the pedestrian underpass. Construction staging would cover an area of approximately 2 acres.

### *Yosemite Lodge Parking Area*

In Alternative 6, the area west of Yosemite Lodge, currently used as parking for tour buses, transit buses, and overnight guests, would be re-developed to provide 300 day-use parking spaces, campsites for 20 RV's, parking for 15 buses, a new 3,000 square foot comfort station, and a re-located shuttle stop. The existing tour bus drop off area would be relocated to the Highland Court area. The wellness center, linen storage and laundry buildings would be removed. Ground disturbance over a 13.5 acre area would include 10.6 acres of clearing and grubbing, 55,850 square feet of existing building and pavement removal, 3,000 square feet for the new comfort station and shuttle stop, 17,300 square feet of utility service trenching, 3.6 acres for parking, and 5,000 square feet for pedestrian pathways. Construction staging would take place over a 2 acre area within the existing footprint. Existing vegetation would be retained to separate and screen parking bays while bioswales would serve to filter and treat storm water run-off.



### ***Yosemite Lodge Housing***

In Alternative 6, the temporary modular housing at Highland Court and the Thousand Cabins would be removed and replaced with two new buildings to house 104 concessioner employees. In addition, a new parking area would provide 78 employee parking spaces, parking for 3 shuttle buses, and 53 day-use parking spaces for the public. Ground disturbance for the two housing sites would cover a total of 7.4 acres and would include 45,500 square feet of preparation for the new buildings, 5,500 square feet of utility service trenching, and 1.8 acres for parking.

### ***El Portal Road from the Big Oak Flat Road to Pohono Bridge***

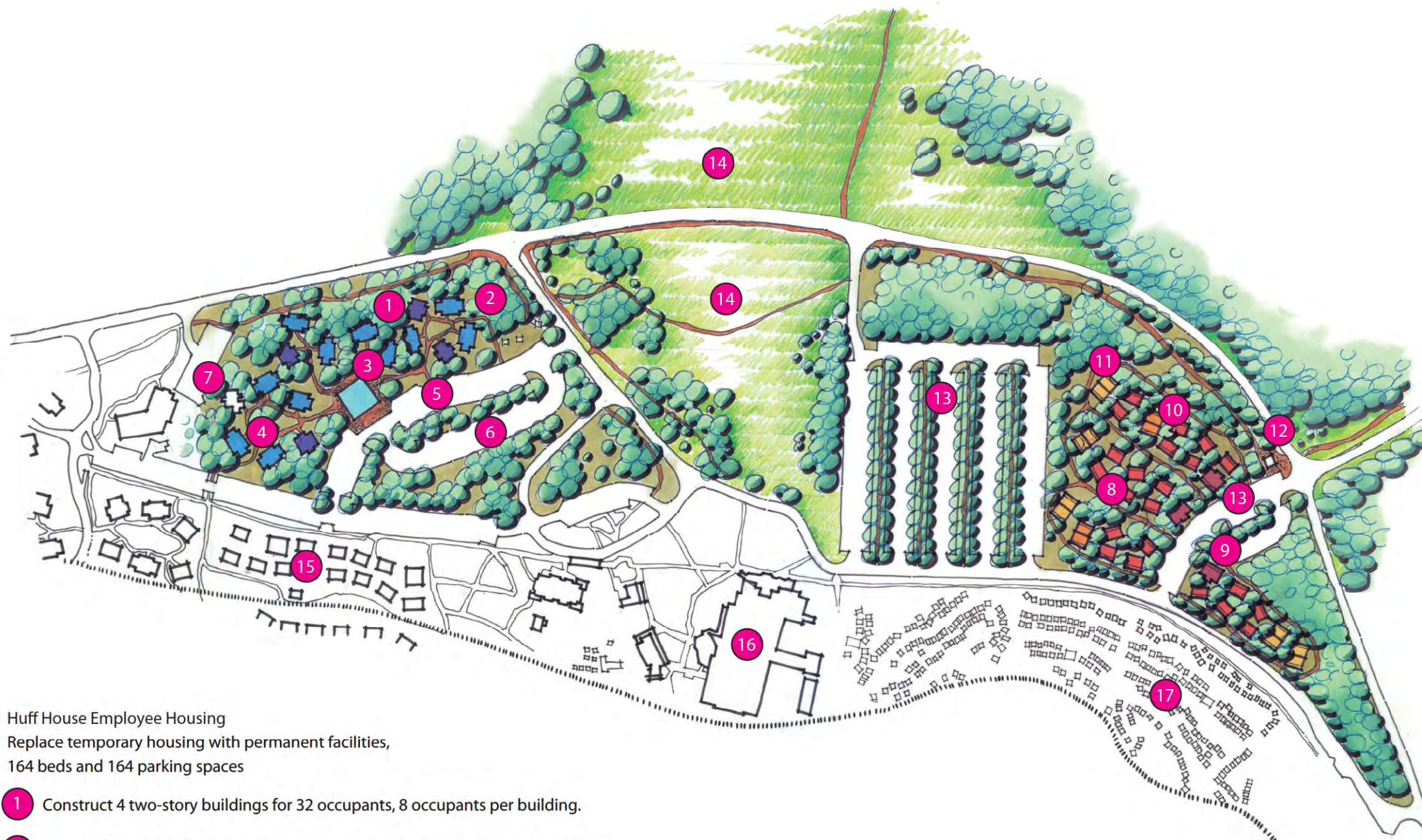
The 0.6 mile road segment of El Portal Road from the intersection of the Big Oak Flat Road to Pohono Bridge currently contains a number of non-delineated, dirt roadside pullouts. Five of the larger pullouts are located on the south side of the road immediately adjacent to the Merced River, while one is located on the north side of the road just west of the intersection with Northside Drive and Southside Drive. The use of these dirt pullouts and associated informal trails on the south side of the road is causing erosion and vegetation trampling of the riverbank in some locations. Common to all of the action alternatives, four of the pullouts on the south side of the road would be paved and formalized to provide parking for a limited number of vehicles. These pull-outs would be curbed to prevent further encroachment towards the river and would accommodate up to 20 total vehicles with the remaining roadside and riverbank soils would decompacted and restored to natural conditions. The largest pullout, located just east of the Big Oak Flat Road/El Portal Road intersection, would be removed and restored to natural conditions to avoid impacts to sensitive resources and to address safety concerns. The existing paved pullout on the north side of the road just west of the intersection with Northside/Southside Drive would also be formalized to accommodate 6 vehicles for a total parking capacity of 26 vehicles along this section of road. Curbing would be installed along the remaining south side road shoulder to prevent vehicles from creating additional informal pullouts, causing further resource damage. Of the 13 existing drainage culverts along this segment of the road, two would be removed and the remainder either retained or reconstructed in a manner that is consistent with their historic character and function.

### ***Concessioner General Office***

In Alternative 6, this office space would be replaced by reconfiguring the interior of the existing Concessioner Maintenance and Warehouse building located east of the NPS Government Utility Area. A 4,000 square foot addition to this building would also be constructed. The expansion of the building would require the elimination of 10 to 12 parking spaces that would be replaced nearby along Village Drive.

Additional parking spaces for vehicles associated with the existing and relocated maintenance and warehousing operations, administrative vehicles and private vehicles used by employees would be expanded near the facility to accommodate the increased occupancy of the remodeled worksite. Specific locations being considered for parking include formalizing approximately 17 spaces along Village Drive, 6 spaces to the northeast of the warehouse building, approximately 16 spaces along Boulder Lane, approximately 15 spaces along the north side of Tenaya Way and an additional 15 spaces north of the existing auditorium. Development of parking spaces behind the auditorium would require the removal of one existing employee residence.





Huff House Employee Housing  
Replace temporary housing with permanent facilities,  
164 beds and 164 parking spaces

- 1 Construct 4 two-story buildings for 32 occupants, 8 occupants per building.
- 2 Construct 11 two-story buildings for 132 occupants, 12 occupants per building.
- 3 Provide common recreational area, approximately 3,600 square feet.
- 4 Build plaza areas and walkways with site furnishings, accent paving, and enhanced landscaping.
- 5 Construct a shuttle bus stop.
- 6 Remove ice rink and bicycle rentals. Construct an employee parking facility with 164 spaces.
- 7 Retain historic residence for housing purposes.

Boys Town Guest Lodging  
Replace tent cabins with 98 permanent guest cabins and 78 parking spaces

- 8 Construct 25 duplex buildings replicating historic cabins, or 50 units subtotal.
- 9 Construct 2 four-plex buildings, or 8 units subtotal
- 10 Construct 5 eight-plex buildings, or 40 units subtotal
- 11 Relocate Campground Reservation Center, provide 8 parking spaces.
- 12 Construct a roadway connecting Curry Village and East Valley Campgrounds with 78 parking spaces guests and 8 short-term parking spaces for Campground Reservation Center. 20 parking spaces will be reserved for guest use in Curry Orchard Parking Area.

Curry Orchard Parking Area

- 13 Improve parking area with 430 spaces and landscape buffers with trees and bioswales that will treat storm water run-off.

Meadow Restoration Area

- 14 Improve hydrology, remove invasive species, promote weed control and plant native species.

Existing Curry Village Visitor Services

- 15 Retain existing historic cabins and Stoneman Cottage (65 lodging units).
- 16 Retain existing Curry Pavilion.
- 17 Retain 290 tents.

\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



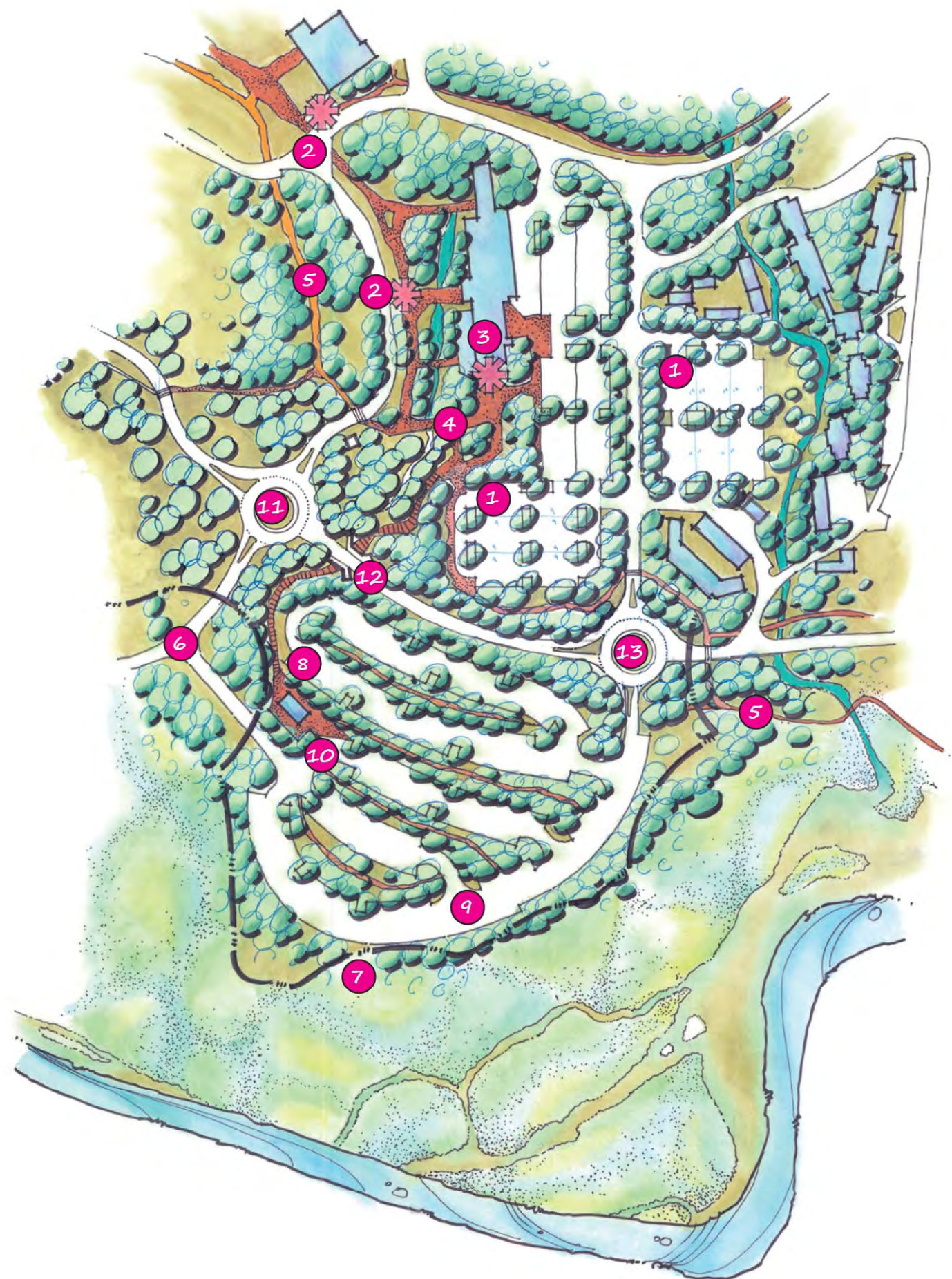
## Alternatives 5 and 6 Conceptual Site Drawing for Curry Village

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- 1 Eliminate Concession General Office and Garage located between the Village Store and Ahwahnee Meadow, providing more space for visitor parking.
- 2 Retain shuttle stops on Visitor Center Loop Drive.
- 3 Replace Village Sport Shop with visitor contact station.
- 4 Eliminate existing art activity center and improve pedestrian access.
- 5 Improve pedestrian connections and bike paths east and west of the day-use parking area.
- 6 Provide a two-way access driveway from Sentinel Drive as the primary entrance to the day-use parking area.
- 7 Redesign the day-use parking area to provide a 150-foot buffer from the river. Restore wetlands and meadow.
- 8 Create pedestrian pathways to lead visitors to the Yosemite Village mall. Construct a comfort station in a central location, connected to pedestrian walkways.
- 9 Provide 850 day-use parking spaces. Provide landscaped areas to retain large numbers of trees and screen parking bays and bioswales that will treat storm water run-off. Provide pedestrian pathways.
- 10 Relocate shuttle bus pick-up and drop-off area.
- 11 Construct a roundabout to alleviate traffic congestion at the intersection of Northside Drive and Sentinel Drive.
- 12 Construct a pedestrian underpass to eliminate conflict between automobiles and pedestrians on Northside Drive.
- 13 Construct a roundabout at the day-use parking area intersection with Village Drive and Northside Drive.



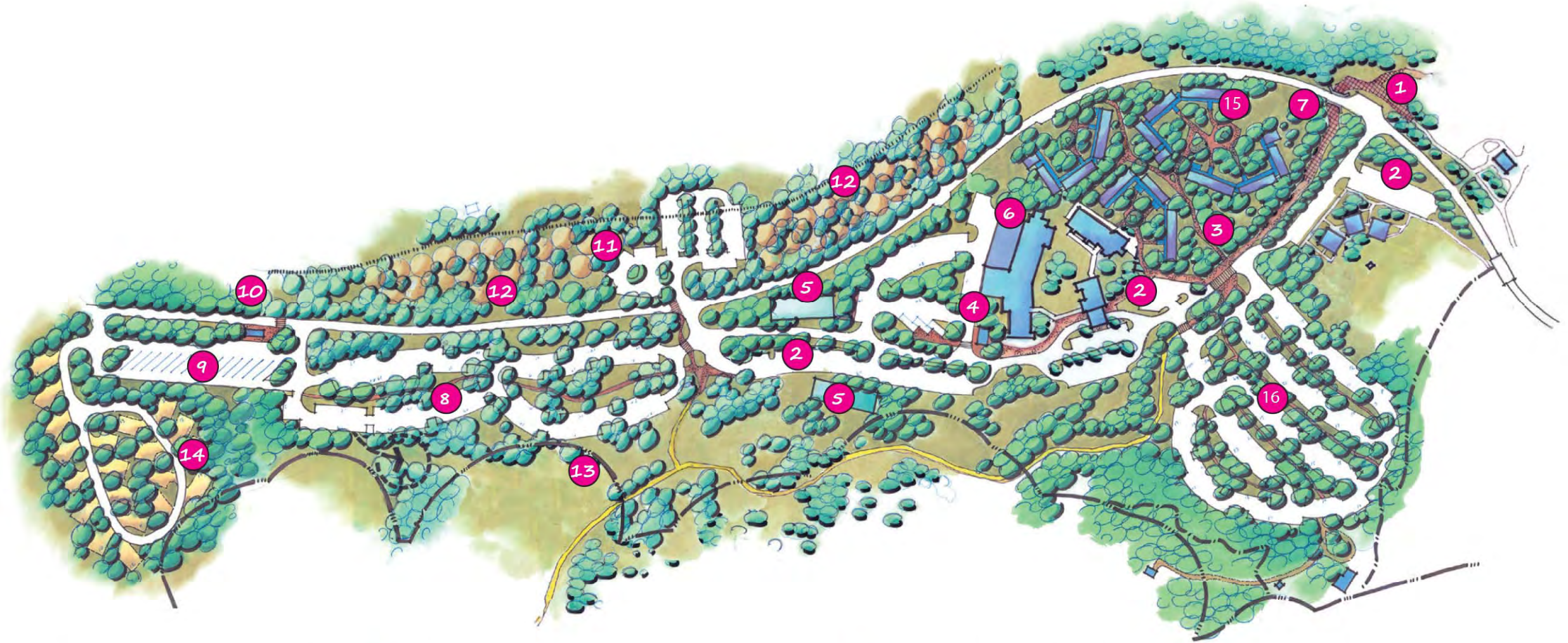
**Alternative 6**  
**Conceptual Site Drawing for**  
**Yosemite Village Day-use Parking Area**  
 Yosemite National Park  
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\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



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**1** Re-align Yosemite Lodge intersection within the limits of existing developed areas.

**2** Maintain parking for overnight guests.

**3** Enhance pedestrian circulation system.

**4** Construct tour bus loading and unloading area, with shelter.

**5** Construct employee housing in 2 two-story buildings with 52 occupants per building and 39 employee parking spaces per building.

**6** Relocate linen storage and laundry buildings from the 100-year floodplain to an addition to the food service building. Reconfigure truck loading and unloading area. Demolish and remove existing NPS volunteer office.

**7** Reconstruct a section of the Yosemite Lodge entrance road as a pedestrian and bicycle promenade with a 5% slope to an underpass. Install accent paving, landscaping, wayfinding and site furnishings, and low-voltage site lighting consistent with design vocabulary for the Yosemite Falls trail.

**8** Construct 300 visitor parking spaces at Yosemite Lodge Day-use Parking Area. Maintain existing vegetation as buffers to separate and screen parking bays and bioswales that will treat storm water run-off. Provide pedestrian pathways.

**9** Construct 15 tour bus parking spaces.

**10** Construct a shuttle bus stop with shelter and comfort station.

**11** Construct 41 additional parking spaces at Camp 4.

**12** Retain 35 existing walk-in campsites at Camp 4. Construct 35 additional walk-in sites opposite existing parking facility. Occupancy is limited to 6 campers per site. Standard walk-in campsite is 3,850 square feet (70-foot diameter), including 1,200 square feet of clearance with a 15-foot perimeter buffer.

**13** Protect and enhance a 150-foot riparian buffer.

**14** Construct an RV loop with 20 campsites.

**15** Remove guest lodging buildings and construct a three-story lodging complex with a total number of 440 lodging units and an equivalent number of guest parking spaces. Organize high-density development area to maintain existing vegetation where possible

with courtyards and outdoor gathering areas for each building. Provide in-fill landscaping as required to maintain a forested environment and a visual buffer.

**16** Construct parking area for 395 cars to augment existing parking areas and satisfy added lodging requirement. Maintain existing vegetation as buffers to separate and screen parking bays, and bioswales that will treat storm water run-off. Provide pedestrian pathways.

\* These drawings are provided to demonstrate where facilities would be removed, relocated, or constructed according to actions more fully described by project alternatives. The drawings do not represent a final proposal. More detailed design and construction documents would be developed consistent with the general concepts presented here.



## Alternative 6 Conceptual Site Drawing for Yosemite Lodge and Camp 4 Yosemite National Park

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## THE ENVIRONMENTALLY PREFERRABLE ALTERNATIVE

### Legal Mandates

The Council on Environmental Quality (CEQ) regulations implementing NEPA (Code of Federal Regulations 40:1505.2) and the NPS NEPA guidelines require that “the alternative or alternatives which were considered to be environmentally preferable” be identified. Environmentally preferable is defined as “the alternative that would promote the national environmental policy as expressed in NEPA section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1981).

Section 101 of NEPA states that:

It is the continuing responsibility of the Federal Government to . . .

- 1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;*
- 2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;*
- 3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;*
- 4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;*
- 5) achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life's amenities; and*
- 6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.*

### Conformance

Alternative 5 has been determined to be the alternative that has the greatest benefits to the biological and physical environment, while protecting, preserving, and enhancing historic, cultural, and natural resources. Alternative 5 would achieve a balance between population and resource use by maintaining current peak visitation levels without yet having to implement a day-use permit system. Additionally, Alternative 5 would restore essential riverbank areas within 100-foot buffer adjacent to Yosemite Valley campgrounds, including some of Upper and Lower River Campgrounds; and some acreage around Housekeeping Camp. This alternative would attain the widest range of beneficial uses of the environment by providing a diversity of recreational opportunities through an increase in the inventory of overnight accommodations, inventory of parking facilities, and paddling access to all segments (despite the elimination of commercial paddling).

The No Action Alternative (Alternative 1) would provide for diversity and variety of individual choice; however, it would not best fulfill any of the other requirements, particularly in Yosemite Valley, where increasing amounts of visitor use and foot traffic would continue to adversely affect ecologically sensitive meadow and riparian areas, archeological resources, scenic values, visitor experience, visitor safety, and park operations.

All of the action alternatives (Alternatives 2-6) would fulfill all of the above requirements through continuation of existing wilderness and resource management policies, ecological restoration of fragile meadow and riparian areas, protection of water quality, protection of archeological and historical resources, and conformance with existing requirements under Executive Order 13514 to improve energy efficiency, reduce consumption and waste, and conserve water use to improve sustainability of NPS operations and facilities. The alternatives would vary primarily in the extent of riparian restoration in Yosemite Valley; diversity of recreational opportunities affected by a range of user capacity and visitor use management, inventory and mixture of overnight accommodations, inventory and locations of parking facilities, and paddling restrictions.

Alternative 2 would have the most benefit to the biological and physical environment of the river due to the removal of three bridges and 6,664 linear feet of rip-rap. This alternative would ecologically restore the greatest number of acres through removal of roads, lodging and parking facilities, and infrastructure from meadows and other sensitive resources. Alternative 2 also would include extensive restoration of the 100-year floodplain adjacent to Valley campgrounds, including Upper and Lower River; complete removal of North Pines campground and stables and Housekeeping Camp; removal of Yosemite Lodge; removal of Tecoya housing areas. However, this alternative is the least protective of historic and cultural resources due to the removal of the three historic bridges and removal of historic lodging at Merced Lake High Sierra Camp, Housekeeping Camp, Curry Village, and Yosemite Lodge, and removal of the Wawona golf course. Finally, this alternative would result in the greatest reduction of the diversity of individual choice because it would reduce the inventory and mixture of overnight accommodations; implement the most restrictions on visitor use through a permit system required at the entrance stations; and result in the most restrictions to paddling.

Alternative 3 would have significant benefit to the biological and physical environment due to removal of three bridges and 6,135 linear feet of rip-rap. This alternative would include extensive restoration within 150-foot buffer adjacent to Valley campgrounds, removal of Yosemite Lodge units in the 100-year floodplain, removal and/or re-aligning roads through meadows, and major restoration of the Curry Orchard Parking Lot. As Alternative 2, this alternative would also remove the three historic bridges and Wawona golf course, and reduce historic lodging at Merced Lake High Sierra Camp, Housekeeping Camp, Curry Village, and Yosemite Lodge, though not to the extent proposed in Alternative 2. Alternative 3 would result in a moderate reduction in diversity of individual choice due to a reduction in overnight accommodations, day-use permit system, and minor paddling restrictions.

Alternative 4 would have moderate benefit to the biological and physical environment due to the removal of two bridges and 6,135 linear feet of rip-rap. This alternative would restore fewer acres than Alternatives 2 and 3, include partial restoration of Yosemite Valley meadows, and ecological restoration within a 150-foot buffer in Valley campgrounds. Alternative 4 would be slightly more protective of historic and cultural resources than Alternatives 2 and 3 because Stoneman Bridge would be retained, as well as all units at Yosemite Lodge. Alternative 4 would attain a wider range in beneficial uses over Alternatives 2 and 3 through the replacement of the Merced Lake High Sierra Camp with a temporary pack camp, a major increase in camping opportunities, a minor reduction in lodging from current levels, and fewer agency restrictions regarding paddling and day-use access.

Alternative 6 would provide outstanding, diverse recreational opportunities in the river corridor and would retain significant historic resources in all river segments. However, it would have only minor benefit to the biological and physical environment due to having the fewest number of acres restored and the fewest linear feet of rip-rap removed.

In comparison, Alternative 5 would strike a balance between maintaining the historic setting of the river corridor, maintaining a diversity of recreational opportunities, and allowing for extensive natural resource management throughout the river corridor to restore natural ecosystem function to the extent possible.

## **ACTIONS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS**

Federal agencies are required to rigorously explore and objectively evaluate all reasonable actions and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). As described in “Purpose and Need” (Chapter 2), public and internal scoping and planning sought to understand and consider input from the public, NPS staff, subject-matter experts, culturally associated American Indian tribes and groups, and other federal, state, and local agencies as part of an extensive planning process for the *Merced River Plan/DEIS*.

As a reminder, Chapter 2 describes actions brought forth during the planning process that the NPS considered but dismissed. The NPS removed actions from consideration if they were:

- Outside the scope of the plan.
- Already decided by law, regulation, or other higher-level decision.
- Not relevant to the decision to be made.
- Missing a valid cause and effect relationship.
- Associated with small effects relative to the decision to be made.
- Conjectural and not supported by scientific or factual evidence.
- Unreasonable or infeasible because they would be cost prohibitive, violate law or policy, or contribute to other resource concerns or hazards.
- Inconsistent with the facilities and services analysis criteria (see Chapter 7)

Additionally, the following actions were considered but dismissed from the range of alternatives in the *Merced River Plan/DEIS*:

**The NPS should reintroduce historical fire regimes as part of an ecological restoration and fuels management approach while balancing fire management with public safety, air quality, and visual experience values.**

*Rationale for Dismissal:* Fire management issues are addressed under the 2009 Yosemite Fire Management Plan and under annual workplans.

**The NPS should restore the Merced River corridor to conditions as existed prior to Euro-American settlement by removing nearly all commercial services and lodging, visitor facilities, limiting private vehicles, and conducting extensive restoration projects.**

*Rationale for Dismissal:* This action is inconsistent with the NPS’ Organic Act to provide for visitors’ experiences of the natural and cultural resources.

**When using a quarter-mile boundary throughout the river corridor, the NPS should keep a “scenic” classification in Wawona and East Yosemite Valley.**

*Rationale for Dismissal:* The boundaries and classifications of the Merced Wild and Scenic River have been presented and refined throughout the legal and planning history for the Wild and Scenic River. The classification of a river segment provides a general framework for the type and intensity of land management activities that may take place in the future (IWSRCC, 2002). To provide for visitors’ experiences as guided by the 1916 NPS’ Organic Act, a recreational classification in Wawona and East Yosemite Valley is appropriate and justified.

**The NPS should include the entire Yosemite Valley within the MRP boundaries.**

*Rationale for Dismissal:* The Wild and Scenic Rivers Act allows up to a maximum average of 320 acres per linear mile of river (equivalent to one-quarter mile on each side of the river) to be included within the boundaries of a Wild and Scenic River corridor. The project study area, however, of this plan includes all of Yosemite Valley within 1.5 miles of the Merced River’s ordinary high-water mark. This project study area ensures that NEPA and NHPA analysis will examine the impacts and effects to natural, cultural and socioeconomic resources throughout Yosemite Valley.

**The NPS should increase development in Wilderness areas.**

*Rationale for Dismissal:* The Merced River Plan is not considering an expansion of services and facilities in the entire river corridor. Furthermore, addition of permanent structures and development would violate the Wilderness Act of 1964 (with very limited exceptions where essential for administering an area as Wilderness).

**The NPS should re-align the river and allow a smaller channel of the river to continue to flow under Sugar Pine and Ahwahnee bridges.**

*Rationale for Dismissal:* Re-aligning a river is counter to restoring the free flow of a river. Also, the engineering of a river is a fundamental violation of the Wild and Scenic Rivers Act (with very limited exceptions where essential for administering an area as Wilderness).

**The NPS should restore all Yosemite Valley campsites that existed prior to the 1997 flood and/or are determined consistent with the General Management Plan (GMP).**

*Rationale for Dismissal:* The level of camping contemplated in the GMP proposed camping in locations that are ecologically sensitive, and the GMP was approved prior to designation of the Merced River as Wild and Scenic in 1987, therefore, it did not contemplate river values. Some campsites that existed prior to the 1997 flood, such as at Upper and Lower River Campgrounds, were sited on or adjacent to sensitive resources now considered river values. In response to public comment, the range of alternatives commit to providing a maximum number of campsites while protecting and enhancing river values. As required by WSRA, the Merced River Plan must provide for the ecological restoration of the river corridor. The NPS has determined that this protection requires the removal of existing campsites within a 100-foot riparian buffer between the ordinary high-water mark and the nearest campsite. In addition, due to the hydrologic processes ORV, new campsite development must incorporate a 150-foot riparian between the ordinary high-water mark and campsites located near the river.

**The NPS should have the Wilderness Stewardship Plan address the High Sierra camps.**

*Rationale for Dismissal:* The NPS must address how the High Sierra camps and all other major public use facilities in the river corridor affect river values.

**The NPS should eliminate private vehicles and tour buses from Yosemite Valley (as stated as a goal in the General Management Plan).**

*Rationale for Dismissal:* Although the removal of private vehicles in Yosemite Valley was a goal of the 1980 General Management Plan, the Merced River Plan/ DEIS will amend the GMP. This action would not meet the purpose and need of this plan. Existing transportation networks will not support this option, and construction of new transportation networks would be infeasible from a cost perspective to only allow access by public transit. In addition, the range of alternatives includes actions that reduce crowding and do not require the elimination of private vehicles. Finally, existing modes of travel provide for a diversity of visitor experiences that are integral to developing direct connections with the river.

**The NPS should widen Northside Drive and Southside Drive to improve traffic flow.**

*Rationale for Dismissal:* This action contradicts the purpose and need of a Wild and Scenic River Comprehensive Management Plan because it is not possible to widen road corridors in Yosemite Valley without impacting ORVs including meadow and riparian communities, and sensitive cultural resources.

**The NPS should limit tour bus access in Yosemite Valley because tour buses contribute to congestion, parking shortages, and road safety.**

*Rationale for Dismissal:* The NPS will continue supporting increased use of alternative forms of transportation. In addition, the NPS will only consider an East Yosemite Valley day-use parking permit system for private vehicles and tour buses when conditions become “unacceptable.” Thresholds for acceptable conditions are defined and monitored using scientific standards.

**The NPS should use pedestrian overpasses to alleviate pedestrian-vehicle conflicts at major crosswalks.**

*Rationale for Dismissal:* The NPS recognizes the need to separate pedestrians from vehicles in these congested areas. Construction of pedestrian overpasses that provide adequate accessibility for all visitors would require infrastructure that would be disproportionate to the landscape, and, therefore, would infringe on the scenic landscapes in these areas. The NPS has chosen pedestrian underpasses to remediate this pedestrian-vehicle conflict without affecting the scenic nature of Yosemite Valley.

**The NPS should re-introduce native fish to areas where they naturally occurred.**

*Rationale for Dismissal:* Although some Wild and Scenic River fisheries are considered outstandingly remarkable, this has not been the case of the Merced River fisheries within Yosemite. Native fish are found only in the lower elevations of the Merced River up to the vicinity of El Portal. Historically, the majority of waterbodies in Yosemite have been naturally fishless prior to fish stocking, which occurred in the area from 1877 to 1990. The native strain of rainbow trout in the Merced River corridor was lost long ago through hybridization with other introduced trout strains. The existing strain of rainbow trout acts as an ecological surrogate for the native strain. Restoration of the native strain would require detection of a relict population of native fish and eradication of the existing rainbow strain and introduced brown trout. The NPS considers native trout restoration infeasible on the Merced River due to the difficulty of eradication of the brown trout and existing rainbow trout. In addition, some fish have the ability to swim from El Portal to Yosemite



Valley, the non-native fish present in El Portal would likely recolonize upstream, causing additional stress and hybridization with a re-introduced population of native rainbow trout. Because native fish are not an ORV of the Merced River, this action was dismissed.

**The NPS should relocate all visitor services and employee housing from Yosemite Valley to El Portal.**

*Rationale for Dismissal:* Services are needed to support the level of visitation where that visitation occurs, primarily Yosemite Valley. Supporting the needs of millions of visitors requires a large workforce. Shuttling the entire employee population in and out of Yosemite Valley over multiple shifts throughout the course of the day would further compound traffic congestion currently experienced by visitors and significantly increase the carbon footprint associated with visitors and employees. Currently, Yosemite's park management has moved a substantial number of employees out of Yosemite Valley and out of El Portal. Further adjustments are infeasible and impractical at this point from a park operation's standpoint.

**The NPS should provide a visitation level higher than what Alternative 6 offers.**

*Rationale for Dismissal:* The National Park Service has considered a range of alternatives that provide lower and higher user capacities and related visitor use levels than exist today. Alternative 6 represents the highest use levels considered in this range. Capacities and use levels higher than those proposed in this alternative were considered but dismissed for the following reasons:

- Higher use levels would require significant expansion of infrastructure and development, which is not feasible while protecting river values and working within the constraints of Yosemite Valley's natural environment. Yosemite Valley, where the majority of use occurs in the Merced River corridor, is a long, narrow canyon. Significant physical sites constraints exist limiting the expansion of infrastructure and developments that would be needed to accommodate higher use levels. Between rockfall and related hazard zones and floodplains and the locations of river values, no land area remains to expand developments beyond those proposed in Alternative 6.
- Infrastructure that would be required to accommodate higher use levels include widening roadways and intersections, retaining roadside parking in areas adjacent to meadows, expanding existing parking areas into sensitive resource areas or closer to the river, developing new parking areas and or camping areas in location that have not been previously disturbed. However, other alternatives to expanded parking include a multi-level parking garage that would not be congruent with retaining the natural scenic qualities of Yosemite Valley and would be cost prohibitive.
- Visitor use levels beyond those considered in alternative six would create additional crowding and congestion such as long queues at entrance stations, increased travel times through the park, and difficulties locating open parking, all of which would negatively affect the visitor experience.

## **COST COMPARISONS FOR THE MERCED WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN**

The costs of implementing the MRP are defined for each alternative by the management actions that are included within the plan. Table 8-52 summarizes those costs that do not vary across the action alternatives and thus are considered common to all. Table 8-53 summarizes those costs that vary by alternative. These costs include natural resource protection and site improvements that would occur within the river corridor. Total project costs are summarized in Table 8-54.

**TABLE 8-52: PROJECT COSTS COMMON TO ALTERNATIVES 2-6**

Project Component	Common to All
<b>Yosemite Valley</b>	
Yosemite Valley Maintenance Area	\$9,833,708
Concessioner General Office Relocation	\$5,043,300
Bridalveil Fall	\$755,152
<b>El Portal</b>	
El Portal housing additions	\$5,973,381
<b>Wawona</b>	
Swinging Bridge Picnic Area	\$668,359
Wawona Maintenance Area	\$13,001,235
Wawona Town Center	\$1,811,354
<b>Miscellaneous Site-Specific Actions*</b>	
Costs Common to Alternatives 2-6	\$6,606,193

**TABLE 8-53: ALTERNATIVE PROJECT COSTS**

Project Component	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
<b>Yosemite Valley</b>						
Upper Pines Campground	\$0	\$590,359	\$3,555,559	\$7,529,202	\$7,529,202	\$7,529,202
Concessioner Stables	\$0	\$292,916	\$87,875	\$3,837,283	\$0	\$0
North Pines Campground	\$0	\$1,137,238	\$470,402	\$470,402	\$204,555	\$204,555
Lower Pines Campground	\$0	\$306,329	\$363,372	\$363,372	\$480,466	\$480,466
Curry Village Lodging and Employee Housing	\$0	\$45,005,402	\$30,520,312	\$32,526,590	\$46,294,562	\$48,327,763
Bridge Removals	\$0	\$3,950,898	\$3,950,898	\$2,637,067	\$1,520,682	\$0
Housekeeping Camp	\$0	\$1,767,149	\$1,767,149	\$622,807	\$419,802	\$245,445
Upper & Lower River Campgrounds	\$0	\$0	\$0	\$5,995,990	\$2,518,316	\$5,995,990
Yosemite Village Day-use Parking Area	\$0	\$8,311,720	\$7,763,719	\$7,918,376	\$10,019,466	\$11,844,989
Lost Arrow Employee Housing	\$0	\$811,650	\$811,650	\$7,711,355	\$7,711,355	\$7,711,355
Yosemite Lodge and Camp 4	\$0	\$17,460,290	\$24,156,475	\$28,617,726	\$27,641,055	\$100,779,542
West Valley Overflow Parking Area	\$0	\$0	\$0	\$0	\$1,216,099	\$2,040,209
El Capitan Meadow	\$0	\$0	\$0	\$926,478	\$926,478	\$926,478
Eagle Creek Campground (New)	\$0	\$0	\$0	\$0	\$4,401,403	\$6,668,792
<b>El Portal</b>						
Rancheria housing area	\$0	\$8,381,837	\$9,396,417	\$15,264,905	\$13,540,040	\$14,763,465
Abbieville-Trailer Court	\$0	\$52,794,663	\$2,249,936	\$2,249,936	\$2,249,936	\$55,531,245
<b>Wawona</b>						
Wawona Campground	\$0	\$1,963,465	\$1,881,298	\$1,881,298	\$1,651,233	\$1,651,233
<b>Miscellaneous Site-Specific Actions*</b>						
Unique to the alternative	\$0	\$8,165,000	\$7,830,000	\$2,580,000	\$2,150,000	\$1,575,000

\*These costs include removal of rip-rap (or riverbank lining); removal of informal trails, installation of engineered log jams, brush layering and willow plantings to address riverbank erosion; and other like actions.

**TABLE 8-54: TOTAL PROJECT COSTS**

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
<b>Total**</b>	<b>\$0</b>	<b>\$262,752,657</b>	<b>\$186,971,954</b>	<b>\$222,514,383</b>	<b>\$235,125,897</b>	<b>\$418,457,354</b>

\*\*TOTAL INCLUDES net construction costs +35% TO ACCOUNT FOR COSTS ASSOCIATED WITH FOLLOW ON COMPLIANCE, SITE MONITORING AND CONTRACTING.

In total, the range of alternatives is priced from \$186 Million to \$418 Million when measured in current-year values. The mean (or average) cost of the range of alternatives is \$265 Million, while the median (or middle) value is \$235 Million. The preferred alternative would cost \$235 Million, approximately 90 percent of the mean cost of the entire range of alternatives.

## Anticipated Total Project Costs

Natural resource protection cost estimates were developed by NPS vegetation and ecological restoration biologists who have knowledge and expertise in undertaking work of this nature. These estimates presume use of existing park staff, base-funded positions, seasonal workers, consultants and volunteers to complete restoration work. Labor and material costs associated with actions common to all action alternatives include management actions that would remove rip-rap (or riverbank lining); remove abandoned infrastructure, such as bridge footings, plumbing or drainage structures; remove informal trails; loosen compacted soils; re-align trails to less-sensitive areas, harden trails in other locations; install engineered log jams, brush layering and willow plantings to address riverbank erosion; remove a limited number of problem campsites; remove asphalt and concrete; provide access to the river in certain locations; restore wetlands and portions of the flood plain; and remove obsolete buildings.

Specific resource restoration projects are also proposed across the range of alternatives, and are unique to one or more of the alternatives. Examples of these projects include proposed actions to remove certain roadways and bridges in Alternatives 2 and 3; construct boardwalks in meadows; restore the flood plain to different levels, such as the 10-year versus 100-year elevation; remove varying amounts of infrastructure from the flood plain; and install of varying numbers of engineered log jams.

Site redevelopment or improvement of existing facilities and a limited amount of new development is proposed for the purpose of protecting river values and supporting ongoing visitor use and enjoyment. Specific sites and projects are presented by rows in Table 8-52 and Table 8-53 and are described in more detail by project alternatives. Alternatives generally propose such actions as adding walk-in camp sites in several locations (Upper Pines, Upper and Lower River and Camp 4 campgrounds); replacing tents with permanent lodging units at Curry Village; replacing temporary employee housing with permanent structures in Curry Village, Yosemite Lodge, and El Portal; removing units from Housekeeping Camp; improving parking areas at Yosemite Village Day Use Parking Area, Yosemite Lodge, and in Wawona and El Portal; and proposing one new parking facility known as the West Valley Day Use Area.

Project alternative cost comparisons for Alternatives 2, 3, 4, 5 and 6 were generated by a senior cost estimating technical specialist and civil engineer from the Denver Service Center, one of only two agency employees who work full time in this capacity service-wide. Estimates are based upon management actions described in project alternatives and accompanying conceptual site plans. The cost estimating technician identified individual components of each project described by each of the alternatives, such as building descriptions and proposed uses, square footage, proposed demolition or adaptive re-use of structures, site preparations and site improvements (transit connections, required roadways, parking areas, pedestrian walkways and landscaping) and landscape enhancements for parking areas.

Cost estimates consider market prices for raw materials (sand, gravel and stone), building materials (lumber, construction paper, roofing material), windows and doors, heat, ventilation and air conditioning systems, plumbing and electrical fixtures, asphalt and other forms of concrete, etc. Specific costs were tabulated according to the characteristics of development proposed.

After calculating direct construction and development costs (or direct costs), estimates were adjusted according to a number of factors that are unique to the cost of working in Yosemite National Park. These factors include design fees and preparation of construction documents, cost of living for the region, remoteness, prevailing wage rates, state and local taxes to be paid by the contractor, commuting and lodging costs, special compliance requirements, contractor overhead, expectations for profit, bonds and permits, contracting method adjustments and rates of inflation. These factors are expressed as simple percentages known as mark-ups or add-ons resulting in net costs per unit. Costs were further adjusted to include project management costs that will otherwise accrue to the NPS, such as contracting and oversight functions, additional compliance, long-term monitoring, *et cetera*.

The full cost estimates amount to approximately 680 pages of analysis provided through detailed spreadsheets. Because of the volume and detail contained in the cost estimator's report, it is not feasible to reproduce the information within the river plan, but this information remains available for reference as part of the administrative record.

Class C cost estimates represent a broad overview of anticipated project costs. These estimates are intended to provide a realistic understanding of the full costs of project implementation, to help decision makers choose a preferred alternative and to establish long-term budget goals. Following the anticipated approval of the Merced River plan, as project descriptions are refined and design and construction documents prepared, Class B and Class A estimates will be completed in greater detail, with more accuracy and precision.

## **Operational (or non-Facility) Costs**

In order to protect and enhance river values and manage visitor use from year to year, implementation of the alternatives will require time and effort by staff resources, volunteers or contractors. These costs may increase or decrease depending on which alternative is selected. Management actions would require more or less operational maintenance, traffic and parking management, law enforcement and other ongoing duties of NPS and concessioner personnel. Park staff will be responsible for monitoring specific indicators and standards that are linked river values and related natural and cultural resources.

Approximate costs associated with operational costs are summarized in Table 8-55. Although specific operational costs are identified, each activity relates to existing monitoring programs or regular park management activities that are already conducted with existing park staff. The size of the park staff fluctuates seasonally, but the overall number of full-time employees varies from 800 in winter to approximately 1,000 in late spring and summer. Given flexibility in staffing and the size of the park's annual operating budget, operational costs are less significant than site-specific costs but are noteworthy for the purpose of comparing alternatives.

**TABLE 8-55: ADDITIONAL OPERATIONAL (NON-FACILITY) COSTS**

Project Component	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Cultural resources monitoring *	\$0	\$115,000	\$115,000	\$465,000	\$465,000	\$465,000
Facilities management and maintenance †	\$0	\$269,110	\$315,701	\$828,313	\$800,079	\$1,138,465
River value monitoring program †	\$0	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000
Traffic and parking management †	\$0	-\$69,300	-\$77,700	-\$39,900	-\$10,500	\$8,400
Wildlife management †	\$0	\$0	\$0	\$110,000	\$65,000	\$150,000
* One-time cost	\$0	\$115,000	\$115,000	\$465,000	\$465,000	\$465,000
† Annual recurring costs	\$0	\$499,810	\$538,001	\$1,198,413	\$1,154,579	\$1,596,865

Cost figures presented here or elsewhere in the plan are intended to provide a general estimate of the relative costs of implementing the project alternatives. NPS and industry cost estimating guidelines were used to develop costs in 2012 dollars to a reliable and accurate extent, but estimates should not be used for budgeting purposes. Specific costs will be determined in subsequent, more detailed planning and design exercises, and will consider the design of facilities, identification of detailed resource protection needs, and changing visitor use expectations and constraints on user capacity. Actual costs to the NPS will vary depending on if and when the actions are implemented, and on contributions by partners and volunteers.

The implementation of this plan, regardless of which alternative is selected, will depend on future NPS funding levels and service-wide priorities, and on partnership funds, time, and effort. The approval of this plan does not guarantee that project funding or staffing are forthcoming. Full implementation of this plan is anticipated over a period of 15 to 20 years.

## COMPARISON OF USER CAPACITIES AND ALTERNATIVES ACTIONS

The following pages present summaries of alternatives as follows:

**TABLE 8-56: SUMMARY OF ALTERNATIVE CAPACITIES**

**TABLE 8-57: VISITOR DAY USE CAPACITIES (PEOPLE)**

**TABLE 8-58: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE**

TABLE 8-56: SUMMARY OF ALTERNATIVE CAPACITIES

ADEIS MRP USER CAPACITY SUMMARY													
User Capacities by Use Type and Location		Alt 1 (No Action)		Alt 2		Alt 3		Alt 4		Alt 5		Alt 6	
	Unit Type	Units	People	Units	People	Units	People	Units	People	Units	People	Units	People
<b>Wilderness Above Nevada Fall</b>													
Visitor Overnight Use	Zone Capacities & Beds	380	380	195	195	260	260	270	270	362	362	380	380
Visitor Day Use	Day Hikers	350	350	350	350	350	350	350	350	350	350	350	350
Employee Housing	Employee Beds	15	15	5	5	10	10	10	10	15	15	15	15
Administrative Day	People on Day Patrols	5	5	5	5	5	5	5	5	5	5	5	5
<b>Yosemite Valley</b>													
Visitor Overnight Use	Rooms & Campsites	1,500	6,564	1,006	4,758	1,098	5,027	1,524	7,224	1,693	7,729	1,987	9,006
Visitor Day Use*	Parking Spaces & Buses	-	8,272	-	6,819	-	6,289	-	7,554	-	8,954	-	9,449
Employee Housing	Employee Beds	1,315	1,315	658	658	1,086	1,086	1,087	1,087	1,136	1,136	1,136	1,136
Administrative Day	Parking Spaces	166	332	166	332	166	332	166	332	166	332	166	332
<b>Gorge</b>													
Visitor Overnight Use	Rooms & Campsites	-	-	-	-	-	-	-	-	-	-	-	-
Visitor Day Use	Parking Spaces	180	869	180	869	180	869	180	869	180	869	180	869
Employee Housing	Employee Beds	9	9	9	9	9	9	9	9	9	9	9	9
Administrative Day	Parking Spaces	2	4	2	4	2	4	2	4	2	4	2	4
<b>El Portal</b>													
Visitor Overnight Use	Rooms & Campsites	-	-	-	-	-	-	-	-	-	-	-	-
Visitor Day Use	Parking Spaces	214	740	214	740	214	740	214	740	214	740	214	740
Employee Housing	Employee Beds	192	192	618	618	223	223	300	300	288	288	506	506
Administrative Day	Parking Spaces	610	1,220	610	1,220	610	1,220	610	1,220	610	1,220	610	1,220
<b>South Fork Above Wawona</b>													
Visitor Overnight Use	Zone Capacities	20	20	20	20	20	20	20	20	20	20	20	20
Visitor Day Use	Day Hikers	6	6	6	6	6	6	6	6	6	6	6	6
Employee Housing	Employee Beds	-	-	-	-	-	-	-	-	-	-	-	-
Administrative Day	Day Patrols	1	1	1	1	1	1	1	1	1	1	1	1
<b>Wawona</b>													
Visitor Overnight Use	Rooms & Campsites	203	865	171	673	176	703	176	703	190	787	190	787
Visitor Day Use*	Parking Spaces & Buses	-	1,295	-	1,321	-	1,321	-	1,399	-	1,606	-	1,606
Employee Housing	Employee Beds	121	121	121	121	121	121	121	121	121	121	121	121
Administrative Day	Parking Spaces	30	60	30	60	30	60	30	60	30	60	30	60
<b>South Fork Below Wawona</b>													
Visitor Overnight Use	Overnight Hikers	3	3	3	3	3	3	3	3	3	3	3	3
Visitor Day Use	Day Hikers	3	3	3	3	3	3	3	3	3	3	3	3
Employee Housing	Employee Beds	-	-	-	-	-	-	-	-	-	-	-	-
Administrative Day	Day Patrols	1	1	1	1	1	1	1	1	1	1	1	1

\*Day use capacities in these segments factors in visitors arriving by private vehicles, regional transit and commercial tour buses. See breakdown by transportation mode in Table 8-57



**TABLE 8-57: VISITOR DAY USE CAPACITIES (PEOPLE)**

Visitor Day Use Capacities (People)	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6
<b>Wilderness above Nevada Fall</b>						
MAX hikers thru corridor to Half Dome	300	300	300	300	300	300
MAX hikers per day to corridor	50	50	50	50	50	50
<b>ABOVE NEVADA FALL TOTAL</b>	<b>350</b>	<b>350</b>	<b>350</b>	<b>350</b>	<b>350</b>	<b>350</b>
<b>Yosemite Valley</b>						
PAOT from parking areas	7,260	5,858	5,328	6,497	7,549	7,941
PAOT from regional transit	293	241	241	337	684	788
PAOT from tour buses	720	720	720	720	720	720
<b>VALLEY TOTAL</b>	<b>8,272</b>	<b>6,819</b>	<b>6,289</b>	<b>7,554</b>	<b>8,954</b>	<b>9,449</b>
<b>Gorge</b>						
PAOT from parking areas	869	869	869	869	869	869
<b>El Portal</b>						
PAOT from parking areas	740	740	740	740	740	740
<b>South Fork above Wawona</b>						
MAX hikers per day to corridor	6	6	6	6	6	6
<b>Wawona</b>						
PAOT from parking areas	911	911	911	911	911	911
PAOT from regional transit	0	26	26	104	311	311
PAOT from tour buses	384	384	384	384	384	384
<b>WAWONA TOTAL</b>	<b>1,295</b>	<b>1,321</b>	<b>1,321</b>	<b>1,399</b>	<b>1,606</b>	<b>1,606</b>
<b>South Fork below Wawona</b>						
MAX hikers per day to corridor	3	3	3	3	3	3

Alternative 1 (No Action)						
Alternative 2						
Alternative 3						
Alternative 4						
Alternative 5						
Alternative 6						
Ecological Restoration						
Total restoration acreage	0 acres	347 acres	302 acres	223 acres	203 acres	170 acres
Riprap	15,589 linear feet (existing)	6,664 linear feet removed	6,135 linear feet removed	6,135 linear feet removed	6,135 linear feet removed	6,048 linear feet removed
Free-flowing Condition (Bridges)	0 bridges removed	Remove 3 bridges: Ahwahnee, Sugar Pine, and Stoneman	Remove 3 bridges: Ahwahnee, Sugar Pine, and Stoneman	Remove 2 bridges: Ahwahnee, and Sugar Pine	Remove 1 bridge: Sugar Pine	0 bridges removed. Use design and engineering solutions.
Meadow Connectivity (Roads)	No re-routing of roads	<ul style="list-style-type: none"><li>Remove Southside Drive along Stoneman Meadow</li><li>Remove Northside Drive along Ahwahnee Meadow</li></ul>	<ul style="list-style-type: none"><li>Remove Southside Drive along Stoneman Meadow</li><li>Remove Northside Drive along Ahwahnee Meadow</li></ul>	<ul style="list-style-type: none"><li>Remove Southside Drive along Stoneman Meadow</li></ul>	Roads remain. Design and engineering solutions applied.	Roads remain. Design and engineering solutions applied.
Camping (Existing)						
Backpackers	25 walk-in sites	0 walk-in sites (-25 sites but partially relocated)	0 walk-in sites (-25 sites but partially relocated)	0 walk-in sites (-25 sites but partially relocated)	10 walk-in sites (-15 sites that are relocated)	10 walk-in sites (-15 sites that are relocated)
Camp 4	35 walk-in sites	35 walk-in sites	35 walk-in sites	35 walk-in sites	35 walk-in sites	35 walk-in sites
Lower Pines	76 sites	44 sites (-32 sites)	61 sites (-15 sites)	61 sites (-15 sites)	71 sites (-5 sites)	71 sites (-5 sites)
North Pines	86 sites	0 sites (ecologically restored)	52 sites (-34 sites)	52 sites (-34 sites)	72 sites (-14 sites)	72 sites (-14 sites)
Upper Pines	240 sites	216 sites (-22 sites)	238 sites (-2 sites)	238 sites (-2 sites)	238 sites (-2 sites)	238 sites (-2 sites)
Yellow Pine Administrative	4 group administrative sites	0 sites (-4 group sites)	4 group administrative sites	4 group administrative sites	4 group administrative sites	4 group administrative sites
Wawona Campground and Wawona Stock Camp	99 sites (includes 1 group site and 2 stock sites)	67 sites (-32 sites) (2 stock sites relocated to Wawona Stables)	72 sites (-27 sites) (2 stock sites relocated to Wawona Stables)	72 sites (-27 sites) (2 stock sites relocated to Wawona Stables)	86 sites (-13 sites) (2 stock sites relocated to Maintenance Yard)	86 sites (-13 sites) (2 stock sites relocated to Wawona Stables)
Total Existing Camping Sites	565 sites	362 sites	462 sites	462 sites	516 sites	516 sites
Campground Development (New)						
West of Backpackers Walk-in	0 sites	16 walk-in sites	16 walk-in sites	16 walk-in sites	16 walk-in sites	16 walk-in sites
East of Camp 4 Walk-in	0 sites	35 walk-in sites	35 walk-in sites	35 walk-in sites	35 walk-in sites	35 walk-in sites
Upper Pines RV-Loop	0 sites	0 sites	36 RV sites	36 RV sites	36 RV sites	36 RV sites
Upper Pines Walk-In	0 sites	0 sites	0 sites	51 sites (49 walk-in sites, 2 group sites)	51 sites (49 walk-in sites and 2 group sites)	51 sites (49 walk-in sites and 2 group sites)
Former Upper River Walk-In	0 sites	0 sites (ecologically restored)	0 (ecologically restored)	32 sites (30 walk-in sites, 2 group sites)	30 walk-in sites	32 sites (30 walk-in sites and 2 group sites)
Former Lower River Walk-In	0 sites	0 sites (ecologically restored)	0 (ecologically restored)	40 walk-in sites	0 sites	40 walk-in sites
Concessioner Stables in Yosemite Valley (re-purposed as drive-in camping)	0 sites	0 sites	0 sites	41 drive-in car sites	0 sites	0 sites
Boys Town Walk-In	0 sites	0 sites	0 sites	40 walk-in sites	0 sites	0 sites
Eagle Creek (drive-in car and RV)	0 sites	0 sites	0 sites	0 sites	42 sites (40 drive-in car and 2 group sites)	79 drive-in car and RV sites
Yosemite Lodge Walk-In (re-purposed as camping)	0 sites	104 sites (100 walk-in and 4 group sites)	0 sites	0 sites	0 sites	0 sites
West of Lodge RV Sites	0 sites	0 sites	0 sites	20 RV sites	0 sites	20 RV sites
Abbieville / Trailer Court	0 sites	4 group administrative sites	0 sites	0 sites	0 sites	0 sites
Total New Camping Sites Total	0 sites	159 sites	87 sites	311 sites	210 sites	309 sites
Total Camping Sites Corridorwide	565 sites	521 sites	549 sites	773 sites	726 sites	825 sites
Wilderness Camping						
Merced Lake Backpackers Camping Area; Little Yosemite Valley Camping Area; and Moraine Dome Camping Area	All three designated camping areas remain.	All three designated camping areas are discontinued. Area converted to dispersed camping.	All three designated camping areas are discontinued. Area converted to dispersed camping.	Continue designated camping areas at all three sites. (Note: Little Yosemite Valley Camping Area reduced. Merced Lake Backpackers Camping Area expanded.)	Continue designated camping areas at all three sites.	Continue designated camping areas at all three sites.

	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
<b>Lodging</b>						
Curry Village Lodging Units	400 units (per Settlement Agreement, 103 guest lodging units can not be included in No Action)	433 lodging units at Curry Village, consisting of 143 hard-sided units and 290 tents.	355 lodging units at Curry Village, 65 hard-sided units and 290 tents. Boys Town would be ecologically restored.	355 units at Curry Village, consisting of 65 hard-sided units and 290 tents. Convert Boys Town to a 40-site campground.	453 units at Curry Village, consisting of 163 hard-sided units and 290 tents.	453 lodging units at Curry Village, consisting of 163 hard-sided units and 290 tents.
Yosemite Lodge	245 rooms	0 rooms (-245 rooms with area re-purposed as day lodge and camping)	143 rooms (-102 rooms comprised in 4 buildings removed from 100-year floodplain)	245 rooms	245 rooms	440 rooms (construct multiple 3-story lodging structures outside the 100-year floodplain).
Housekeeping Camp	266 units	0 units (-266 units: Convert to river access and picnicking, and ecologically restore 100-year floodplain)	0 units (-266 units: Convert to river access and picnicking, and ecologically restore 100-year floodplain)	100 units (-166 units: Removed from ordinary high-water mark)	232 units (-34 units: Removed from bed and banks)	232 units (-34 units: Removed from bed and banks)
Ahwahnee Hotel	123 rooms	123 rooms	123 rooms	123 rooms	123 rooms	123 rooms
Wawona Hotel	104 rooms	104 rooms	104 rooms	104 rooms	104 rooms	104 rooms
Merced Lake High Sierra Camp	22 units (60 beds)	0 units (lodging facility closed and re-purposed as camping)	15 people (lodging converted to temporary pack camp)	0 units (lodging facility removed and ecologically restored)	11 units (-18 beds)	22 units (60 beds)
Lodging Totals (units)	1,160 units	660 units	725 units	927 units	1,168 units	1,374 units
<b>Transportation</b>						
Curry Orchard Parking Area	424 spaces	420 spaces	300 spaces	300 spaces	430 spaces	430 spaces
Yosemite Village Day-use Parking Area	754 spaces	550 spaces (parking moved north)	550 spaces (parking moved north)	750 spaces (parking moved north)	850 spaces (parking moved north)	850 spaces (parking moved north)
Yosemite Lodge: Converted to Day Lodge	0 spaces	250 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Yosemite Lodge Parking Area	0 spaces	150 spaces	150 spaces	150 spaces	300 spaces	300 spaces
West Valley Overflow Parking Area	No	No	No	No	100 spaces	250 spaces
Total Yosemite Valley Day-Use Parking	2,337 spaces (0% change)	1,800 spaces (-23% change)	1,597 spaces (-31% change)	2,045 spaces (-13% change)	2,448 spaces (+5% change)	2,598 spaces (+11% change)
El Portal Remote Visitor Parking	No	No	No	200 spaces	200 spaces	200 spaces
Roundabouts / Traffic Circles	No	No	No	No	• Traffic Circle: Northside Drive and Village Drive (at Yosemite Village Day-use Parking Area)	• Roundabout: Northside Drive and Village Drive (at Yosemite Village Day-use Parking Area) • Roundabout: Northside Drive and Sentinel Drive (at Bank 3-Way)
Pedestrian Underpasses	No	No	No	• Yosemite Falls Underpass	• Yosemite Falls Underpass	• Yosemite Village Day-use Parking Area Underpass • Yosemite Falls Underpass
<b>Concession Housing</b>						
Concession Employee Beds (in Yosemite Valley)	1,151 employees	494 employees	922 employees	923 employees	972 employees	972 employees
Temporary Housing Units Removed (all occurring within Yosemite Valley)	- 0 beds	- 519 beds	- 489 beds	- 469 beds	- 439 beds	- 439 beds
Permanent Replacement Housing (in Yosemite Valley)	+ 0 beds	+ 164 beds	+ 268 beds	+ 318 beds	+ 318 beds	+ 318 beds
Permanent Replacement Housing (in El Portal)	+ 0 beds	+ 426 beds	+ 31 beds	+ 108 beds	+ 96 beds	+ 314 beds
<b>East Valley Visitation and Parking</b>						
Daily Visitation to East Yosemite Valley (Day and Overnight)	20,900 visitors	13,900 visitors	13,200 visitors	17,000 visitors	19,900 visitors	21,800 visitors
Total Parking (day, overnight, and administrative use) in East Yosemite Valley	5,200 spaces	4,000 spaces	4,300 spaces	4,800 spaces	5,300 spaces	5,900 spaces
<b>Cost Estimates</b>						
Total Project Costs	\$0 (if no actions taken)	\$262,752,657	\$186,971,954	\$222,514,383	\$235,125,897	\$418,457,354

# COMPREHENSIVE RIVER VALUE ANALYSIS

## INTRODUCTION

Section 10(a) of the Wild and Scenic Rivers Act (WSRA) requires managers to “protect and enhance the values which caused [the river] to be included in [the wild and scenic rivers] system.” The 1982 Secretaries’ Guidelines for River Areas (USDI and USDA 1982) indicate that the nondegradation and enhancement standard for the outstandingly remarkable values (ORVs) of a wild and scenic river is initiated at time of designation. Consistent with section 10(a) of WSRA, Alternatives 2 – 6 give primary emphasis to protecting the river’s “esthetic, scenic, historic, archeological and scientific [biological, geologic, and hydrologic] features” by proposing actions that would address the management concerns identified for these values.

While the actions proposed in this plan are designed to improve the condition of individual river values, this section examines the collective impact of all actions to ensure that the consequences of actions to protect one resource do not have unintended impacts to others. The combination of actions included in each alternative to protect a specific river value (described in Chapter 5) coupled with actions related to land use and facilities, and the user capacity management program are evaluated here for their overall net effect on each river value. These effects are compared with the measures of adverse effect and degradation provided in Chapter 5 as a checkpoint for the conclusion that all alternatives will protect and enhance all river values and meet the intent of WSRA.

## ALTERNATIVE 2

### River Value- Free-flowing Condition (All Segments)

A free-flowing river, or section of a river, moves in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis. Riprap revetment, abandoned infrastructure within the bed and banks of the river, and bridges that constrict the flow of the river may produce localized effects on free-flowing condition of the river. Alternatives 2-6 would enact a comprehensive suite of actions to enhance the free-flowing condition of the river by removing 3,400 linear feet of riprap and removing abandoned and unnecessary infrastructure from the river channel and its floodplain. Infrastructure that would be removed includes former sewage treatment facilities, sewer and water lines, and former bridge abutments. Alternative 2 would remove an additional 964 linear feet of riprap beyond that proposed for removal under Alternatives 2-6.

Alternative 2 also proposes removal of the Stoneman, Ahwahnee, and Sugar Pine bridges, which produce hydraulic constrictions that lead to accelerated erosion and prevent natural channel migration during high-water events. The removal of the three bridges would help achieve the robust ecological restoration principles that guide Alternative 2.

There are no new facilities proposed under Alternative 2 that would affect the free-flowing condition of the river. A number of proposed facility actions would enhance the connectivity of the river and its floodplain

(see Hydrological/Geological ORVs). For example, Alternative 2 would relocate the Yosemite Village Day-use Parking Area north, outside the 10-year floodplain, and the Odger's fuel storage area in El Portal would be moved out of the 500-year floodplain.

To protect the river's free flowing condition in the future, the NPS would require all proposed projects involving construction within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSRA. Through this process, the NPS would ensure that water resources projects within the designated river corridor would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition.

**Conclusion:** The free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis. This alternative includes localized management considerations such as intermittent riverbank riprap, and bridges that constrict river flows. Alternative 2 proposes a comprehensive suite of actions to enhance the free-flowing condition of the river by removing riprap, removing unnecessary infrastructure in the river channel, and removing three bridges that produce pronounced hydraulic constrictions at high water flows. There are no new facilities proposed under Alternative 2 that would affect the free-flowing condition of the river within the river channel, and a number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/ Geological ORVs). The NPS would require all proposed projects within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSRA to ensure that water resources projects would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition. The actions proposed under Alternative 2 ensure that there are no direct or adverse effects on the free-flowing condition of the Merced River.

## River Value- Water Quality (All Segments)

The water quality of the Merced River is extremely high, and the current water quality of the river is fully protected and enhanced on a segmentwide basis. Intermittent local instances of contamination may occur in connection with surface water runoff from parking areas, recreational vehicle dump stations in proximity to the river, and accelerated erosion with potential sediment loading in the river during high water flows. Alternatives 2-6 would apply mitigation measures to ensure that surface water runoff associated with parking areas protects the water quality of the Merced River and meets regulations. The Upper Pines and Wawona recreational vehicle dump stations would be moved away from the river, and the Odger's bulk fuel storage area in El Portal would be moved out of the 500-year floodplain. In addition, Alternative 2 would relocate the Yosemite Village Day-use Parking Area outside the 10-year floodplain. All campsites and infrastructure currently within 100-feet of the river would be removed. The pack trail from Curry Village stables to Happy Isles would be re-routed farther away from the river. These actions would result in less erosion along the riverbank, reduce use in sensitive areas, direct use to resilient areas, and mitigate potential sources of pollutants.

Large-scale ecological restoration actions would take place along the riverbank and floodplain of the Merced River. These actions would enhance water quality, particularly the actions that re-establish

riverbank vegetation and reduce erosion potential. Ecological restoration actions are described in more detail in the discussion of the biological ORVs below and in Appendix E.

There are no new facilities proposed under Alternative 2 that would affect the water quality of the river. To maintain excellent water quality, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

**TABLE 8-59: CORRIDOR-WIDE ACTIONS AND THEIR IMPLICATIONS FOR WATER QUALITY**

Location	Action in Alternative 2	Effects to Water Quality
<b>Segment 2</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	Campsites within the 100-year floodplain would be removed. Designated river access and put in areas established at resilient areas, discourage access to sensitive areas. Upper Pines dump station relocated away from the river.	These changes would result in less erosion along the riverbank; water quality would be enhanced segmentwide.
New campsites at Backpacker's, Camp 4, and Yosemite Lodge	New campsites constructed at Yosemite Lodge, Backpackers, and Camp 4 out of the 150 foot riparian buffer.	Change would not result in additional water quality effects on a segmentwide level.
Yosemite Village Day-Use Parking Area	Move the unimproved parking lot out of the 10-year floodplain and restore the riparian habitat adjacent to the river.	Change would result in less erosion and storm water run-off from the parking area; water quality would be enhanced locally.
Pack Trail from Concessioner Stables to Happy Isles	Remove the Concessioner stable and the pack trail from the stable to Happy Isles; restore to natural conditions	Change would result in less erosion from the stock trail. Water quality would be enhanced locally.
Housekeeping Camp Lodging	Remove all 266 lodging units and associated facilities out of the 100-year floodplain; restore the floodplain to natural conditions.	Fencing and designated river access points would also direct use to resilient areas. Water quality would be enhanced locally.
<b>Segment 4</b>		
NPS Maintenance and Administrative Complex	Existing parking area formalized and paved using best management practices	Change would result in less erosion and storm water concerns in the parking area; water quality would be enhanced locally.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Removal of bulk fuel storage from the 500-year floodplain would further protect water quality segmentwide.
<b>Segment 7</b>		
Wawona Campground	Replace current septic system with waste water collection system connected to the waste water treatment plant. RV dump site relocated away from the river.	Change would result in less potential for storm water concerns in the campground; water quality would be enhanced locally.
Wawona Picnicking	Delineate boundaries of two formal picnic areas with formal river access points.	Change would result in less erosion along; water quality would be enhanced locally.

**Conclusion.** Under Alternative 2, water quality in all segments of the Merced River corridor would continue to be absent of adverse effects and degradation, and the potential for localized instances of contamination would be strongly reduced. Water quality would therefore continue to be protected on a corridor-wide basis. Alternative 2 would address localized water quality issues by moving the Upper Pines and Wawona recreational vehicle dump stations away from the river, moving the Odger's bulk fuel storage



area outside of the 500-yr floodplain, and applying mitigation measures to ensure surface water runoff associated with parking areas meets requirements. Large-scale riverbank restoration actions would decrease the potential for accelerated riverbank erosion and sediment loading during high water events. To ensure that existing high water quality conditions are maintained, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

## **Segment 1 – Merced River above Nevada Fall (Wild Segment)**

### ***Biological ORV-1 – High-elevation Meadows and Riparian Habitat***

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Primary actions to protect and improve Biological ORV-1 include removal of informal trails that incise meadow habitat, trails in wet and/or sensitive vegetation, and trails that fragment meadow habitat, including trails in the Triple Peak Fork meadow, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and other areas as necessary. Removal of social trails that bisect the meadows would improve conditions in this segment because soil compactions and habitat fragmentation would be reduced. Grazing would be permanently removed from Merced Lake East Meadow and pack stock would be required to pack-in pellet feed to address localized effects from grazing, roll-pits, manure, and trampled soils. Grazing would continue in other meadows in this segment.

This alternative would remove all facilities at the High Sierra Camp and the area would be ecologically restored, converting the area to designated wilderness. Designated camping areas in Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Area would be converted to dispersed camping. Seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones would be managed as indicated in Chapter 8. These changes would reduce use levels near the riverbank and result in some improvement to riparian conditions in the immediate vicinity of these camping areas. Facilities that would remain in this segment of the river include Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the Biological ORV in this segment indicates that these facilities are not adversely affecting the Biological ORV.

As described in Chapter 5, to ensure this ORV is protected and enhanced through time, the NPS would monitor three indicators to assess the condition of the ORV: meadow bare soil, meadow fragmentation due to the proliferation of informal trails, and streambank stability. The NPS would establish a baseline for all three indicators using site-specific monitoring protocols by 2013. Regular monitoring would also reveal whether assumptions about human behaviors and actions taken to correct past actions are sustaining conditions above the management standard. If conditions have reached trigger points; the NPS would implement specific response actions (as described in Chapter 5)

**TABLE 8-60: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-1**

Location	Action in Alternative 2	Effects to ORV-1
<b>Location</b>		
Meadow Trails	Remove informal trails that incise meadow habitat.	Change reduces effects to wet and sensitive meadows and results in localized enhancement to ORV-1.
Merced Lake High Sierra Camp	Remove all facilities at the High Sierra Camp and ecologically restore the area.	Changes reduce uses near riverbank which would result in localized enhancement of ORV 1 through reduction in erosion and trampling of riparian resources.
<b>Visitor Use Management Action</b>		
Private boating would be allowed in this segment	Boating would consist of short floats using pack raft or other craft that can easily be carried. Private use would be unlimited in this segment; however, boaters completing overnight trips would be subject to wilderness permit restrictions.	Limited numbers would protect riparian habitat from trampling and bank erosion that could result with unlimited access. Changes would not affect high-elevation meadow and riparian habitat, this ORV would continue to be protected on a segmentwide level.
Wilderness zone capacity	Zone capacities for Merced Lake, Washburn Lake, Mount Lyell, and Clark Range zones would remain the same across all the alternatives. Manage to a reduced capacity of 25 in the Little Yosemite Valley Wilderness Zone.	Current zone capacities are designed to protect wilderness character including natural conditions such as riverbanks and meadows. Reduced capacity in LYV would result in localized enhancement of riparian habitat and thus this ORV.
Facilities retained	Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp	These facilities and associated administrative uses and maintenance do not affect riparian habitat or meadows.

to avoid or minimize adverse effects. The meadow monitoring programs for the biological ORV would monitor meadow fragmentation to ensure that use levels from hikers, backpackers and stock users do not result in meadow fragmentation or bare ground in excess of the management standards prescribed to protect and enhance meadows.

**Conclusion.** Under Alternative 2, the biological ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance riverbanks and meadows at specific locations. Removal of social trails, grazing in Merced Lake East Meadow, conversion of the designated camping areas to dispersed camping, and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures. Facilities that would remain in this segment of the river include Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the Biological ORV in this segment indicates that these facilities are not adversely affecting the Biological ORV.

### ***Geological/Hydrological ORV-4 – Glacially-carved Canyon in the Upper Merced River Canyon***

As discussed in Chapter 5, there are no management considerations with respect to the U-shaped, glacially carved canyon above Nevada Fall. This ORV is currently protected and enhanced segmentwide within the meaning of the Wild and Scenic Rivers Act. Alternative 2 does not propose any actions that would change

the condition of this ORV over time. Further, the U-shaped, glacially carved attributes of this ORV would not be affected by the types and levels of use authorized under this alternative, which are all directed toward wilderness oriented recreation. The NPS would nevertheless monitor the condition of this ORV to ensure that its condition does not decline.

### ***Scenic ORV-15 – Scenic Views in Wilderness***

Visitors to this Wilderness segment experience scenic views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks. Management considerations associated with the condition of the scenic river above Nevada Fall include contributions of regional air pollution (primary factors contributing to this condition are outside of NPS jurisdiction), visual intrusions of temporary and permanent structures, and crowding in and near wilderness campgrounds. There are few “visual intrusions” noted at the High Sierra Camp and other designated camping areas. However, these effects are local in nature and do not affect the ORV on a segment wide basis. The NPS would ensure that designated camping areas are maintained in a clean and tidy condition. Under Alternative 2, the High Sierra Camp would be removed and replaced with dispersed camping. This change would return scenic views to be keeping with the native landscape. These measures would locally enhance the scenic ORV. Other visitor use management actions under Alternative 2 would reduce crowding, thus additionally enhancing this ORV on a segmentwide basis.

**TABLE 8-61: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR SCENIC ORV-15**

Location	Action in Alternative 2	Effects to ORV-15
Merced Lake High Sierra Camp	Remove all facilities at the High Sierra Camp and ecologically restore the area.	Change would locally enhance ORV because the reduced infrastructure that remains would better blend in to the natural environment.
Merced Lake Backpackers Camping Area	Transfer to dispersed camping area.	Element currently does not cause adverse effects or degradation to ORV on a segment wide basis, thus ORV would continue to be locally protected in this area.
Facilities retained	Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp	These facilities and associated administrative uses and maintenance do not result in segmentwide adverse effects to scenic values. The ORV will continue to be protected on a segmentwide level.

The ORV is determined to be in the protected state, as defined by an absence of adverse effects and degradation, although intermittent air quality concerns are present. Because of the ambient nature of air quality, it cannot be managed exclusively for the river corridor. Facilities that would remain in this segment of the river include Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the scenic ORV in this segment indicates that these facilities are not adversely affecting the scenic ORV.

**Conclusion.** Under Alternative 2, the scenic ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance scenic values in this segment. Removal of the Merced Lake High Sierra Camp, conversion of the designated camping areas to dispersed camping, and ecological restoration of meadows and riparian areas would improve scenic conditions in this segment and thereby enhance the scenic ORV. The wild segment of

the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures.

### ***Recreational ORV-19 – Wilderness Recreation above Nevada Fall***

Visitors to federally designated Wilderness in Segment 1 would engage in a variety of river related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the Wilderness experience. The current condition of this ORV is at or above the management standard at the segment level. Localized management concerns in this segment relate to crowding at Little Yosemite Valley and Moraine Dome backpackers campgrounds, high use levels at the Merced Lake Backpackers Camping Area, and high encounter rates along the trails that connect these areas. Crowding and high use levels affect the Wilderness experience, which is an integral part of the recreational ORV in this segment.

Alternative 2 would remove the Merced Lake High Sierra Camp, remove permanent infrastructure, converting the area to designated Wilderness. The capacity of the Little Yosemite Valley Wilderness Zone would be reduced to 25, and the footprint of the camping area would be reduced accordingly. Designated camping areas in Moraine Dome and the Merced Lake Backpackers Camping Area would be converted to dispersed camping. This would give backpackers an opportunity to camp outside of close proximity to other backpackers. Actions in Alternative 2 would apply additional seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones. These changes would reduce use crowding, high use levels, and increase opportunities for solitude in this Wilderness segment.

Facilities that would remain in this segment of the river include the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. These facilities do not have an adverse effect on the Wilderness experience integral to this Recreational ORV.

NPS would monitor visitor encounter rates to ensure that they are not exceeding established standards. Should specific trigger points be reached, the NPS would be required to implement a series of specific actions to reduce visitor levels to an acceptable level. These actions increase in severity as the current condition ORV condition moves away from the management standard to ensure proper course correction and re-establishment of the management standard. These trigger points were selected to inform managers in advance of any adverse effects or degradation to this ORV.

**Conclusion:** Under Alternative 2, the recreational ORV in Segment 1 of the Merced River corridor would be protected on a segmentwide basis and continue to be absent of adverse effects and degradation on a segmentwide level. Although actions under Alternative 2 would decrease the availability for visitors to pack in to wilderness (on horses or mules) conversion of backpackers campgrounds to dispersed camping, reductions in the zone capacity for Little Yosemite Valley, and removal of the Merced Lake High Sierra Camp would address management considerations by reducing crowding, high use levels, and increasing opportunities for solitude.

**TABLE 8-62: SEGMENT 1 ACTIONS AND IMPLICATION FOR RECREATION ORV-19**

Location	Action in Alternative 3	Effects to ORV-19
<b>Location</b>		
Merced Lake High Sierra Camp	Remove the Merced Lake High Sierra Camp, remove permanent infrastructure, convert the area to designated Wilderness.	The undeveloped and primitive recreation elements of wilderness character are enhanced on a segmentwide level by removal of this facility.
Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Areas	Designated camping areas would be converted to dispersed camping.	The solitude and primitive elements of wilderness character would be enhanced due to the opportunity to camp out of sight and sound of other campers.
Segmentwide River Access	Swimming and water play allowed. No permits required for private boating. No commercial boating	Permitted use and commercial limits would not substantively change current recreational use or recreational values in the segment. Recreational values would continue to be protected segmentwide.
<b>Visitor Use Management Action</b>		
Private boating	Boating would consist of short floats using pack raft or other craft that can easily be carried. Private use would be unlimited in this segment; however, boaters completing overnight trips would be subject to wilderness permit restrictions.	Permitted use would not substantively change current recreational use or recreational values in the segment. Recreational values would continue to be protected segmentwide.
Wilderness zone capacity	Zone capacities for Merced Lake, Washburn Lake, Mount Lyell, and Clark Range zones would remain the same across all the alternatives. Manage to a reduced capacity of 25 in the Little Yosemite Valley Wilderness Zone	Zone capacities are designed to protect recreational setting attributes and recreational experience quality. Reduced capacity in LYV would result in localized enhancement of recreational values in the wilderness.

## Segment 2 – Yosemite Valley (Recreational and Scenic Segments)

### *Biological ORV-2 – Mid-elevation Meadows and Riparian Habitat*

The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada. Actions to protect and enhance Biological ORV-2 under Alternative 2 include:

- Removal of informal trails in meadows where they fragment meadow habitat or cross through sensitive, wet vegetation communities. Overall, restore twelve miles of informal trails throughout Yosemite Valley;
- Use boardwalks or hardened surfaces to allow access to sensitive areas;
- Delineation and re-routing of trails through upland areas and along meadow perimeters;
- De-compacting trampled soils and consolidate multiple parallel trails;
- Re-directing visitor use to more stable and resilient river access points such as sandbars, and designate formal river access sites. Establishing fencing and signage to protect sensitive areas; install boardwalks where appropriate, and actively revegetate where needed;

- Remove all campsites and infrastructure within the 100-year floodplain and restore natural floodplain and riparian habitat;
- Restoration of the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest at specific locations in Yosemite Valley. Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure re-design. Alternative 2 would include 347 acres of ecological restoration.
- Day use parking capacity is expanded and formalized. A total of 1,800 visitor parking spaces would be provided in the Valley accommodating a maximum of 5,858 people at one time to Segment 2. Managing access and other proactive restoration measures would protect Biological ORVs by during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Biological ORVs by removing these uses from the river corridor and managing access in the corridor.

This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Under this alternative, all roads, buildings, campgrounds, trails, utilities and infrastructure, and other facilities in this segment with current local effects on the biological ORV would be removed, reduced, or relocated, including Yosemite Lodge. Facilities that would remain in this segment of the river have no direct impact on the biological river value as indicated in the baseline condition assessment. Effects to the free-flowing condition of the river as a result of the bridges that would remain under this alternative would be mitigated through constructed log jams.

The NPS would monitor three indicators to assess the condition of ORV 2: meadow fragmentation resulting from informal trails, the status of riparian habitat, and riparian bird abundance. As described in Chapter 5, adverse effects and degradation are not present. Actions are proposed to address management considerations pertaining to meadow connectivity, informal trailing, and fragmentation.

The NPS is beginning to monitor the third indicator in this segment, riparian bird abundance. The first status assessments would take place in 2013, after one year of monitoring. The next assessment requires information from two out of three years.

To ensure the biological ORV in Segment 2 is protected and enhanced through time, the NPS would continue to monitor the condition of the ORV to provide early warning of conditions that require management action before effects occur. Regular monitoring would also reveal whether conditions have reached trigger points; and, if so, the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects.



**TABLE 8-63: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2**

Location	Action in Alternative 2	Effects to ORV-2
Segmentwide Restoration	(Common to all) Restoration includes restoration of meadow habitat, removal of informal trails, riparian restoration and establishment of designated river access points, and use of boardwalks and hardened surfaces.	Actions would enhance the biological ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within the 100-year floodplain would be removed. Designated put in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be discouraged; the biological ORV would be enhanced segmentwide.
Stoneman Meadow and Curry Orchard parking lot	Removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. The Orchard Parking Lot would be re-designed. Remove apple trees and landscape with native vegetation. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	These changes would promote water flow and improve meadow health thereby enhancing the biological ORV locally.
New campsites at Yosemite Lodge, Backpacker's, and Camp 4	New campsites constructed at Yosemite Lodge, Backpackers, and Camp 4 out of the 100 year floodplain.	Actions would protect riparian areas from direct impacts related to the increase in visitor activity in these areas. Fencing and designated river access points would also direct use to resilient areas. Monitoring would proactively assess the effectiveness of these actions and established triggers to ensure that future protective measures are implemented in a timely manner. Change would result in protection of biological ORV in this segment.
Ahwahnee, Sugar Pine and Stoneman Bridges	Remove the Ahwahnee, Sugar Pine and Stoneman Bridges, and the associated berms and restore to natural conditions. Reroute the multiple use trail to the north bank of the river. Reroute utilities under Ahwahnee Bridge.	Change would reduce channel widening, erosion, and scouring thereby enhancing local riparian communities.
<b>Yosemite Village and Housekeeping Camp</b>		
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	These changes would reduce effects to riparian corridor and enhance ORV components locally due to restoration. In addition access would be directed to resilient sandy beaches.
Ahwahnee Row and Tecoya Dorms Concessioner Employee Housing	Remove housing and development, recontour topography, decompact soils, and restore stream hydrologic function.	These changes would remove infrastructure from the 100-year floodplain and former meadow and wetland areas thereby locally enhancing the ORV.
Northside Drive (Stoneman Bridge to Yosemite Village Day use Parking Area)	Remove 900' of road and relocate the bike path to the south.	These changes would improve meadow/river connectivity.

Table 8-63: Segment 2 Actions and Implications for Biological ORV-2 (continued)

Location	Action in Alternative 2	Effects to ORV-2
<b>Yosemite Village and Housekeeping Camp (cont.)</b>		
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Drive and restore to natural conditions.	These changes would remove uses from the riverbank thus reducing erosion and trampling effects in riparian corridor and enhancing ORV components locally.
<b>Yosemite Lodge and Camp 4</b>		
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Relocation of this facility outside of the river corridor may reduce informal trailing in the adjacent meadow thereby enhancing the ORV locally.

**Conclusion:** Under Alternative 2, the biological ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance riverbanks and meadows. Removal or relocation of select campsites and infrastructure and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### ***Geological/Hydrological ORV-5 – The “Giant Staircase”***

The NPS has no immediate management considerations with respect to the Giant Staircase characteristic of the geology of Yosemite Valley above Happy Isles as this geologic ORV is determined to be absent of adverse effects and degradation. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### ***Geological/Hydrological ORV-6 – Rare, Mid-elevation Alluvial River***

As described in Chapter 5, the NPS selected the status of riparian habitat as the indicator to specifically assess the effectiveness of actions designed to protect this and other ORVs. This ORV integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities.

The following actions are included to specifically protect and enhance free-flowing conditions and the biological ORV in Segment 2, but would also address the protection and enhancement of the Geologic/Hydrologic ORV in Segment 2:

- Large wood, constructed log jams, and brush layering would be used in the vicinity of bridges to decrease bed scouring and streambank instability, river widening, river constrictions, and low channel complexity. Riprap would be removed where possible and replaced with native riparian vegetation, using bioengineering techniques. In the event that such actions do not improve conditions, bridge redesign or removal could be reconsidered.

## ALTERNATIVES

- Under Alternative 2 the free-flowing condition of the river would be enhanced by removing the Ahwahnee, Sugar Pine, and Stoneman Bridges. Mitigation measures would be employed during removal and the long-term recovery of the removal areas is expected. Restoring free-flowing conditions would enhance riparian communities associated with ORV-6.
- Removing abandoned underground infrastructure, along the river corridor would be part of a comprehensive strategy to correct altered surface and subsurface hydrology.
- Remove riprap where riverbanks do not need stabilization to allow for channel migration. Replace riprap with bioengineered riverbanks, integrating native riparian vegetation, where riverbank stabilization is necessary for protection of critical infrastructure.
- Remove all campsites and infrastructure within the 100-year floodplain and restore natural floodplain and riparian habitat.
- Major restoration of the 100-year floodplain and restoration of the dynamic 10-year floodplain in East Yosemite Valley.

**TABLE 8-64: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR GEOLOGICAL/HYDROLOGICAL ORV-6**

Location	Action in Alternative 2	Effects to ORV-6
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center Parking Area	Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	These changes would reduce effects to the riparian corridor and enhance ORV components locally as use would be relocated away from areas critical to hydrologic function.
Ahwahnee Row and Tecoya Dorms Concessioner Employee Housing	Remove housing and development out of the 100-year floodplain, recontour topography, decompact soils, and restore stream hydrologic function.	These changes would remove infrastructure from the 100-year floodplain and former meadow and wetland areas thereby enhancing the floodplain and geologic/hydrologic processes locally.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	These changes would reduce effects to riparian corridor and enhance ORV components locally. In addition access would be directed to resilient sandy beaches.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Implementation of mitigation measures would protect the floodplain from erosion and other disturbance during construction.
Yosemite Lodge Visitor Facilities	Remove all of the lodging units (~245 units). Repurpose the area outside the 100-year floodplain for Day Lodge and Parking. Restore the 100-year floodplain.	Lodging is outside the 100-year floodplain and is not causing adverse effects
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Lodging is outside the 100-year floodplain and is not causing adverse effects

To ensure this ORV is protected and enhanced through time, the NPS would monitor the condition of the ORV using the status of riparian habitat as an indicator, and take specific actions should conditions reach trigger points.

**Conclusion:** Under Alternative 2, the geologic/hydrologic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would enhance the 10 and/or 100-year floodplains. Actions to protect and enhance free-flowing conditions as well as meadows and riparian complexes in Segment 2 would result in additional enhancement of the geologic/hydrologic ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### ***Cultural ORV-8 – Yosemite Valley American Indian Ethnographic Resources***

As described in Chapter 5, Yosemite Valley American Indian ethnographic resources include relatively contiguous and interrelated places that are inextricably and traditionally linked to the history, cultural identity, beliefs, and behaviors of contemporary and traditionally-associated American Indian tribes and groups. Management considerations related to ethnographic resources involve park operations, crowding, and visitor use. Actions included in the Merced River Plan/DEIS include:

- Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.
- Continue coordination between traditionally associated American Indian tribes, groups, and traditional practitioners (through the Park American Indian Liaison) with law enforcement, fire management, interpretation, invasive species, ecological restoration, and facilities management programs.
- Continue to provide operational guidelines for material staging areas, parking, etc. to protect ethnographic resources.
- Ensure access for traditionally-associated American Indians for participation in annually scheduled traditional cultural events. In addition, tribal access for the personal conduct of ongoing traditional cultural practices would be assured through the Yosemite tribal fee waiver pass program.
- Reduce and formalize day-use parking capacity. Manage access in Segment 2 to protect traditionally-used plant populations in the river corridor during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Cultural ORVs by removing these uses from the proximity of several cultural resources.

Threats to traditionally-used plant populations include invasive species such as Himalayan Blackberry (*Rubus armeniacus*), drainage and hydrology impacts to meadows, and erosion and revetments that affect riparian vegetation. The *Merced River Plan/DEIS* would address these considerations through the following actions:

- The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program would address impacts to some traditionally-used plant populations in some locations.

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- Restoration actions to protect riparian areas, meadows, and hydrological resources would further contribute to the protection and enhancement of the traditional-use plant communities included in this ORV.
- Introduction of seedlings to affected stands of black oaks and protection as necessary to ensure that ratios of adults to saplings is at least 0.65.
- Primary actions to manage major vista points under Scenic ORV-16 include mechanical thinning or removal of conifer trees. This action would be coordinated to ensure that the ORV – 8 trigger point for the ratio of sapling to adult trees is not exceeded.

**TABLE 8-65: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR CULTURAL ORV-8**

Location	Action in Alternative 2	Effects to ORV-8
<b>Curry Village and Campgrounds</b>		
Traditional Cultural Property Documentation	Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary	Documentation, mapping, and evaluation would provide the detail necessary to protect and enhance the ORV segmentwide.
Visitation	13,900 people per day	This level of visitation would improve privacy for traditional cultural practices thereby enhancing the ORV segmentwide. Access to annually-scheduled traditional cultural events and personal conduct of traditional cultural practices would be assured thereby continuing protection of the ORV segmentwide.
Upper Pines, Backpacker's, Concessioner Stables, Camp 4, and Upper and Lower River Campgrounds	All campsites within 100 feet of the river would be removed. New campsites constructed at Upper Pines, Backpacker's, Concessioner Stables, Camp 4, and Upper and Lower River Campgrounds. Designated put in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged. Traditional uses in riparian areas would thereby be enhanced segmentwide.
Curry Village Lodging	Lodging would include 433 units, (143 hard-sided units and 290 tents).	Lodging is outside the 100 year floodplain and is not causing adverse effects or degradation to ORV-6 on a segmentwide basis. The ORV would continue to be protected segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
Housekeeping Camp Lodging	Remove 266 lodging units, out of the observed ordinary high water mark.	These changes would reduce effects to riparian corridor and locally enhance ORV components locally due to restoration. In addition access would be directed to resilient sandy beaches.
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Removal of the tennis courts would allow for recruitment of desirable black oaks in this area thereby enhancing the ORV locally.

Table 8-65: Segment 2 Actions and Implications for Cultural ORV-8 (continued)

Location	Action in Alternative 2	Effects to ORV-8
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Implementation of best management practices would protect the floodplain from erosion and other disturbance. Traditional uses in riparian areas would thereby be enhanced locally.
Yosemite Lodge Visitor Facilities	Removing the existing 245 units.	Restoration in this area may improve conditions for traditional use plants thereby enhancing the ORV locally.
Former Bridalveil Sewer Plant	Remove the buried structure.	Removal of the abandoned infrastructure and native plant revegetation will allow for recruitment of desirable black oaks in this area thereby enhancing the ORV locally.
Yellow Pine Administrative Campground	Remove 4 group administrative use sites (up to 120 people).	Restoration would reduce effects to riparian corridor traditional use plants. Yellow Pines is used for overflow camping during annual traditional cultural events. Removal of this campground and restoration of the site would continue to protect the ORV segmentwide.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Relocation of this facility outside of the river corridor will allow for recruitment of desirable black oaks in this area thereby enhancing the ORV locally.

Facilities that would remain in this segment of the river have no direct impact on the ethnographic component of the cultural ORV as indicated in the baseline condition assessment.

The *Merced River Plan/DEIS* proposes a variety of actions to address specific considerations including continued coordination between traditionally associated American Indian tribes, groups, and traditional practitioners and the NPS; continued access for traditionally associated American Indians for participation in annually scheduled traditional cultural events; and ecological restoration actions to protect and enhance traditionally used plant populations. To prevent future impacts, the NPS would monitor the condition of the ORV, and take specific actions should additional trigger points be exceeded.

**Conclusion:** Under Alternative 2, the ethnographic component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Actions to protect and enhance floodplains, meadows and riparian complexes in Segment 2 would result in additional enhancement of the traditionally-used plant resources of the ethnographic component of the cultural ORV on local and segmentwide levels. Actions that would remove infrastructure and restore black oak woodlands would also enhance a critical component of this ORV. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would not limit access to traditional practitioners because measures would be in place to ensure access to annually-scheduled events as well as individual access for ongoing traditional cultural practices. Furthermore, the overall reduction in visitation under Alternative 2 would reduce the effects of crowding and enhance privacy for traditional cultural practices.



### *Cultural ORV-9 – Yosemite Valley Archeological District*

The Yosemite Valley Archeological District is a linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River. Heavily-used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling stock trail use, parking and informal rock climbing can all affect ORVs in this area. Archeological resource protection would be achieved through actions in this plan to manage visitor use levels, divert foot traffic around sites, removing informal trails, and formalizing river and meadow access locations, mitigating ecological restoration practices by using noninvasive techniques wherever possible. Many of the actions related to ecological restoration in Segment 2, such as delineating roadside parking, would also help protect archeological sites by diverting foot traffic away from sites and into less sensitive areas. Actions to enhance the recreational ORV in Segment 2 would manage recreational users both in terms of flow and location of users at any one time. A reduction in people and vehicles at one time in Yosemite Valley could also reduce visitor use-related effects on archeological resources.

Site-specific treatment actions would be developed through site management plans, where necessary, to avoid resource loss through park actions (such as development, repair, and maintenance of facilities and underground utilities to support visitor use or natural forces).

Management considerations for this ORV also involve continuing to survey and monitor archeological resources as well as update required documentation.

Under Alternative 2 the free-flowing condition of the river would be enhanced by removing the Ahwahnee, Sugar Pine, and Stoneman Bridges. Mitigation measures would be utilized to reduce localized impacts and ensure that this action would not cause adverse effects or degradation to ORV-9 on a segmentwide basis. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Facilities that would remain in this segment of the river have no direct impact on the archeological component of the cultural ORV as indicated in the baseline condition assessment.

The NPS would delineate bike paths, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; remove graffiti at rock art and other sensitive features, conduct public education to discourage climbing, and remove climbing hardware from sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

**TABLE 8-66: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9**

Location	Action in Alternative 2	Impact on ORV-9
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines, and Backpackers Campgrounds	All campsites within 100-year floodplain would be removed. Upper Campsite in culturally sensitive area.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological

		resources. Actions would continue to protect the ORV segmentwide.
Concessioner Stables	Ecologically restore the Curry Village Stables area; eliminate commercial day rides. Remove associated housing (25 beds).	Mitigation measures would protect cultural resources during facility removal. Actions would continue to protect the ORV segmentwide.
Curry Village Lodging	Lodging would include 433 units, (143 hard-sided units and 290 tents).	Mitigation measures would protect cultural resources during facility removal. Actions would continue to protect the ORV segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would protect cultural resources during facility removal and would locally protect the ORV. Actions would continue to protect the ORV segmentwide.
The Ahwahnee Parking Lot	Redesign and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking.	Mitigation measures would protect cultural resources during facility removal. Actions would continue to protect the ORV segmentwide.
Yosemite Village Day-use Parking Area	The Concessioner General Offices, Garage, and the Bank Building are removed. Move the Camp 6 day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	Mitigation measures would protect cultural resources during facility removal. Actions would continue to protect the ORV segmentwide.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	Mitigation measures would protect cultural resources during facility removal. Actions would continue to protect the ORV segmentwide.
Yosemite Village Concessioner Employee Housing	Temporary housing at Huff House and Boys Town is removed. Remove housing units (7 buildings, 64 beds) in rock fall hazard zone. Construct 16 buildings, housing 164 employees using the same dormitory prototype. Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Dr. and restore to natural conditions.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.

**TABLE 8-66: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9 (CONTINUED)**

Location	Action in Alternative 2	Impact on ORV-9
<b>Yosemite Lodge and Camp 4</b>		
West of Yosemite Lodge New Parking	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Yosemite Lodge Visitor Facilities	Remove all of the lodging units (-245 units). Repurpose the area outside the 100-year floodplain for Day Lodge and Parking. Restore the 100-year floodplain.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Change would not affect contributing element of the Archeological District due to location and level of use. Mitigation measures would protect cultural resources during facility removal and construction. Actions would continue to protect the ORV segmentwide.
Yellow Pine, Camp 4, Yosemite Lodge, and West Valley Campgrounds.	Remove camping and restore the 100-year floodplain to natural conditions. Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Remove campground and restore administrative use sites in Yellow Pine (in culturally sensitive area) to natural conditions.	Mitigation measures would protect cultural resources during facility removal. Actions would continue to protect the ORV segmentwide.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Mitigation measures would protect cultural resources during facility relocation. Actions would continue to protect the ORV segmentwide.
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Remove 900' of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.

**Conclusion:** Under Alternative 2, the archeological component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Localized visitor-use-related impacts to archeological resources would be addressed through various enhancement actions. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would reduce the potential for visitor use impacts.

### ***Cultural ORV-10- Yosemite Valley Historic Resources***

As described in Chapter 5, the Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system. Protective actions to address management concerns related to the Yosemite Valley Historic Resources ORV-10 include:

- Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to “good” condition.
- Develop a Historic Structures Report for the LeConte Memorial Lodge NHL to determine the rehabilitation needs to bring the building to “good” condition.
- Rehabilitate the Superintendent’s House (Residence 1) per the Historic Structure Report (Lingo 2012) to bring the building to “good” condition. This rehabilitation of the building will occur under all action alternatives, regardless of whether the building is relocated.

Under Alternative 2 the free-flowing condition of the river would be protected by removing the Ahwahnee, Sugar Pine, and Stoneman Bridges. Relocation of the Superintendent’s House (Residence 1) is proposed under Alternative 2 to address the 1982 Guidelines for the Wild and Scenic Rivers Act that requires managing agencies to consider relocation of major public use facilities outside of the river corridor. These three bridges and the Superintendent’s House (Residence 1) are components of the Yosemite Valley Historic Resources component of the cultural ORV in Segment 2. The NPS would document and interpret any building or structure threatened with removal or relocation. In this manner, while the individual tangible element or elements may be lost or moved, a record of their existence and historical significance would still be available to the public.

To address management considerations, the *Merced River Plan/DEIS* proposes continuing the active program of maintenance for historic buildings and structures; employing existing design guidelines to ensure that new development or redevelopment complements the ORV and the Yosemite Valley Historic District; and periodically assessing and updating professional documentation for the historic resources.

Ecological and scenic value restoration actions in Segment 2 would enhance the cultural landscape which contributes to the historic setting of the resources that comprise the ORV-10. There are no construction actions associated with Alternative 2 that would affect the spatial organization of the historic resource collective, though changes in the circulation patterns as a result of re-routing roads at the Yosemite Village day-use parking area and at Stoneman Meadow would affect circulation patterns that are associated with this ORV. These effects would be localized and would not affect the condition of the ORV on a segmentwide level.

**Conclusion.** Under Alternative 2, the historic resources component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of three bridges and the relocation of the Superintendent’s House (Residence 1) would result in localized effects that would be mitigated through documentation and interpretation. Once removed or relocated, these resources would no longer be considered part of the

**TABLE 8-67: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-10**

Location	Action in Alternative 2	Effects to ORV-10
<b>Curry Village and Campgrounds</b>		
Stoneman Bridge	Remove bridge and restore to natural conditions, make Southside Drive two-way, and redesign Sentinel intersection.	The action would remove 2 contributors to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of these two bridges would not result in a segmentwide adverse effect of the collective of resources.
Stoneman Meadow and Curry Orchard parking lot	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	Change would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective.
Yosemite Village Day-Use Parking Area	Remove Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Re-align the intersection at Northside Drive and Village Drive. Add a three-way intersection at Sentinel Drive and the entrance to the parking area. Provide on-grade pedestrian crossings.	The removal of historic and non-historic properties and re-alignment/re-establishment of the intersections would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
Sugar Pine and Ahwahnee Bridges	Remove both bridges and the connecting berm.	The action would remove 2 contributors to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of these two bridges would not result in a segmentwide adverse effect of the collective of resources.
Superintendent's House (Residence 1)	Relocate outside the river corridor to the NPS housing area. Rehabilitate historic structure in new location.	The action would remove a contributor to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of this resource would not result in a segmentwide adverse effect of the collective of resources.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	The action would affect trails that are connected by the historic footbridges which are components of the Yosemite Valley Historic Resources ORV. Mitigation measures and Section 106 review would ensure the protection of the historic resources and the redesign could result in enhancement of the ORV locally.

ORV collective. All disturbances to circulation and spatial organization associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and documentation (as needed) to ensure that historic resources are protected.

### ***Scenic ORV-16 – Iconic Scenic Views in Yosemite Valley***

Visitors to Yosemite Valley experience scenic views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls. Actions intended to manage natural resources may include the use of prescribed fire or controlled burns to thin forests that are encroaching on meadows; cutting trees, tree branches or other vegetation by mechanical means; and the application of herbicides to control invasive species. Related actions intended to protect the Recreation ORV would limit the number of visitors to lessen visitor density and congestion at attraction sites and make improvements to the transportation system that would reduce automobile congestion. Air quality can affect visitors' ability to experience scenic values in Segment 2. The NPS would cooperate with regional authorities to reduce airborne contaminants caused by combustion, including carbon dioxide emissions, smoke caused by fire, particulate matter generated by construction, and to improve air quality conditions.

In consideration of Wild and Scenic River Act requirements that the NPS consider the presence of existing structures, major facilities and services provided for visitor use, the NPS would eliminate several structures and facilities in Segment 2 under this alternative. Under Alternative 2 actions would remove many structures at the Yosemite Lodge, and the Ahwahnee pool and tennis court. Removal of these structures could enhance scenic resources from specific locations. Ecological restoration actions in Segment 2 would enhance the meadow and riparian communities which contribute to the scenic values in Yosemite Valley. This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Facilities that would remain in this segment of the river have no direct impact on the scenic river value as indicated in the baseline condition assessment. Changes to parking and vehicle traffic in Yosemite Valley to enhance Recreational ORV- 20 particularly the removal of roadside parking along Sentinel Drive and restoration to natural conditions would enhance Scenic ORV-16.

The NPS would monitor the condition of the scenic ORV-16 by removal of conifers encroaching on meadows and vista points, taking action to maintain viewsheds.

**Conclusion:** Under Alternative 2, the scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Tree thinning and ecological restoration actions would improve natural scenic conditions. Removal of buildings at Housekeeping Camp, Yosemite Lodge, the Concessioner Garage, the Concessioner General Offices, and the Concessioner Stables would reduce intrusions on scenic resources. All parking lot and campground construction under this alternative would be subject to park standard operating procedures and subject matter expert review to ensure that scenic resources are protected.



**TABLE 8-68: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR SCENIC ORV-16**

Location	Action in Alternative 2	Effects to ORV-16
<b>Curry Village and Campgrounds</b>		
Select Scenic vista Points	Selectively thin conifers and other trees and shrubs that encroach on selected scenic vista points. Remove unnecessary facilities and ensure that all future development satisfies objectives that provide low contrast ratings.	Changes would enhance the scenic values on a segmentwide level.
Concessioner Stables	Ecologically restore the Curry Village Stables area; eliminate commercial day rides. Remove associated housing (25 beds).	Currently not causing effects on scenic resources. Restoration would improve viewsheds thereby enhancing scenic values locally.
Curry Village Lodging	Lodging would include 433 units, (143 hard-sided units and 290 tents).	Changes to Lodge would be in keeping with current facility and given the location of the facility would not interfere with iconic scenery. The ORV would continue to be protected locally.
Ahwahnee, Sugar Pine, and Stoneman Bridges	Remove the Ahwahnee, Sugar Pine, and Stoneman Bridges.	Given the location of the bridges, removal would not interfere with iconic scenery. The ORV would continue to be protected locally.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts	Given the location of the facility, changes to facilities would not interfere with iconic scenery. The ORV would continue to be protected locally.
The Ahwahnee Parking Lot	Redesign and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking.	Given the location of the facility, changes to facilities would not interfere with iconic scenery. The ORV would continue to be protected locally.
Yosemite Village Day Use Parking Area/Village Center Parking Area	The Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	Removal of buildings would enhance viewsheds locally.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	Removal of Housekeeping units near the river will enhance viewsheds locally.
Yosemite Village Concessioner Employee Housing	Temporary housing at Huff House and Boys Town is removed. Remove housing units (7 buildings, 64 beds) in rock fall hazard zone. Construct 16 buildings, housing 164 employees using the same dormitory prototype. Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Mitigation measures would avoid or mitigate effects to iconic scenic vistas. Actions would continue to protect the ORV locally.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Visitor Facilities	Remove all of the lodging units (-245 units). Repurpose the area outside the 100-year floodplain for Day Lodge and Parking and walk-in Camping. Restore the 100-year floodplain.	Currently not interfering with scenic resources. Viewsheds would be enhanced locally through the removal of these buildings.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins.	The ORV would continue to be protected locally.

## ***Recreational ORV-20 – River-related Recreation in Yosemite Valley***

Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River. Throughout the Yosemite Valley segment, the river has provided the setting for recreational experiences such as fishing, floating, and sightseeing. Transportation is considered an important part of the visitor experience in Yosemite Valley because it is the means of access to recreational opportunities in Yosemite Valley. Management considerations address the amount of vehicle traffic and the number of people at one time in Yosemite Valley at the peak times of day during the park's busy summer season.

All restoration actions to protect and enhance biological, cultural, geologic/hydrologic, and scenic ORVs would further enhance visitors' connections to the river and its values, which are essential to the recreational ORV in this segment. A reduction in day-use, camping, and lodging opportunities would reduce access to these recreational experiences, but would not cause adverse effects or degradation to ORV-20 on a segmentwide basis. The removal of Yosemite Lodge and Housekeeping Camp would eliminate two distinct types of overnight accommodations in Yosemite Valley, but overnight lodging would not be eliminated segmentwide, nor would an essential aspect of the recreational ORV be affected. There are also actions proposed in Alternative 2 that would improve picnicking, and wayfinding. Finally, while commercial boating is eliminated and private boating is limited to 25 trips per day in Segment 2, this alternative reduces crowding and increases the stretches of the river on which private boating and paddling is allowed, thereby enhancing key aspects of this recreational experience.

Chapter 6 provides a more detailed description of the day-visitor capacity management strategies that directly measure aspects of the Recreation ORV and outlines specific actions. These actions include:

- Utilize parking and traffic management staff to improve parking efficiency and traffic flow in Yosemite Valley and other locations where needed.
- Institute a transportation fee at entrance stations (for peak-use season).
- Divert vehicles to other destinations outside of Yosemite Valley when parking in the Valley fills.
- When all parking fills to capacity, day visitors would be diverted at checkpoints throughout the park and at entrance stations.
- East Valley day-use parking permits would be issued by advanced reservation and on a first-come-first-serve basis.

NPS would use the Highway Capacity Manual Pedestrian Level of Service (discussed further in Chapter 5) for evaluating the capacity and quality of service of transportation facilities, including walkways, multi-use paths, and similar pedestrian facilities. NPS would also monitor parking rates and vehicles at one time to ensure that they are not exceeding the management standard. Should specific trigger points be reached, the NPS would implement a series of specific actions to improve parking to an acceptable level. Similarly, should visitor densities begin to approach specific triggers; NPS would take steps to keep such densities within the management standard.

**Conclusion.** Under Alternative 2, the recreation ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping

and lodging opportunities, as well as reduction in visitation particularly during the peak season will significantly reduce crowding thereby enhancing the recreational ORV. All restoration actions would enhance opportunities to connect with the river and its values. The reduction in commercial services would affect opportunities for particular types of recreational activities, but would not affect the essential components of the recreation ORV on a segmentwide basis.

**TABLE 8-69: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR RECREATIONAL ORV-20**

Location	Action in Alternative 2	Effects to ORV-20
Segmentwide visitation	13,900 visitors per day	This reduction in visitation would reduce crowding and congestion thereby enhancing the recreation ORV on a segmentwide level.
Concessioner Stables	Ecologically restore the Curry Village Stables area; eliminate commercial day rides. Remove associated housing (25 beds).	Changes would reduce opportunities for one type of recreational activity, but would not substantially alter components of the river recreation experience. The ORV would continue to be protected on a segmentwide level.
Curry Village Lodging	Lodging would include 433 units, (143 hard-sided units and 290 tents).	Changes to Lodge would increase access to overnight accommodations. Lodge itself is not part of the ORV-20 but does facilitate access to ORV-20 for certain visitors. The ORV would continue to be protected on a segmentwide level.
Lower Rivers Nature Walk	Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	Change would improve interpretation of the river and its values, and would enhance the recreation ORV in this segment.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	(Common to All) Remove the pool and tennis courts	Removal of facilities would reduce opportunities for one type of recreation activities, but would not substantially alter components of the river recreation experience.
Segment wide River Access	Swimming and water play allowed in all segments except 6, impoundment. No commercial boating. Boating allowed on all segments except 6, impoundment. Private use limited to 25 trips per day in Segment 2 between the Pines Campgrounds and Sentinel Beach.	Change would eliminate commercial boating and would limit the number of private boating. However, this change does not affect components of the recreational ORV. This reduction in boats enhances dispersed recreation along the river corridor thereby enhancing the ORV segmentwide.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	Changes to Lodge would reduce access to overnight accommodations and would eliminate one type of recreation activity. The ORV would continue to be protected on a segmentwide level.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	Change would improve circulation and wayfinding thus enhancing ORV-20 locally.

**TABLE 8-69: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR RECREATIONAL ORV-20 (CONTINUED)**

Location	Action in Alternative 2	Effects to ORV-20
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Visitor Facilities	Remove all of the lodging units (-245 units). Repurpose the area outside the 100-year floodplain for Day Lodge and Parking. Restore the 100-year floodplain.	Removal of lodging would have local affect, but would not substantially alter components of the river recreation experience. Changes to Lodge would decrease access to overnight accommodations. Lodge itself is not part of the ORV-20 but does facilitate access to ORV-20 for certain visitors. The ORV would continue to be protected on a segmentwide level.
Yellow Pine, Camp 4, Yosemite Lodge, and West Valley Campgrounds.	Remove camping and restore the 100-year floodplain to natural conditions. Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Restore Yellow Pines site and restore group administrative use sites to natural conditions.	Reduction in the number of campsites limits access to these recreational experiences, but camping opportunities would continue and change would not substantially alter components of the river recreation experience. The ORV would continue to be protected on a segmentwide level.
Recreational Experience Quality	Reduction in available day-use parking, and implementation of an East Yosemite Valley Day-use Parking Permit system	Reduction in the number of parking spaces limits access to these recreational experiences, but personal vehicle parking opportunities would continue and change would not substantially alter components of the river recreation experience. This will enhance the recreational experience of segment 2 by reducing crowding and congestion. The ORV would be enhanced on a segmentwide level.

### Segment 3 – The Merced Gorge (Scenic Segment)

#### *Scenic ORV-17 – Scenic View in the Merced River Gorge*

The Merced River drops 2,000 feet over 14 miles; a continuous cascade under spectacular Sierra granite outcrops and domes. There are no existing management considerations with respect to the Scenic ORV in the Merced River Gorge. Although there are some localized visual intrusions from essential facilities such as visitor parking areas, restrooms, the Arch Rock entrance station and the El Portal Road, these facilities are consistent with the scenic classification of this river segment. As explained in Chapter 5, this ORV is currently protected and enhanced.

This alternative does not propose any new development or landscape changes within the river corridor aside from improvements to existing roadside pullouts and drainage. These changes would not degrade or adversely impact the scenic ORV on a segmentwide basis. Although private vehicles and overall visitation during peak periods will be managed for East Yosemite Valley only, it is probable that visitation and visitors at one time in Segment 3 will also witness a reduction under this alternative. This reduction in visitation and visitors at one time may reduce vehicles per viewshed, thereby enhancing the scenic ORV. Monitoring associated with this ORV would ensure that the attributes that comprise this ORV remain within the accepted management class rating.

Alternative 2 would accommodate the same kinds and amounts of use that exist today in Segment 3. The types and levels of use in Segment 3 under this alternative would remain largely unchanged. Actions considered under Alternative 2 would cause no adverse effects or degradation to ORVs on a segmentwide basis.

**Conclusion.** Under Alternative 2, this scenic river segment would show little evidence of human activity and remain largely free of structures. The scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season in Yosemite Valley will significantly reduce the number of vehicles per viewshed in this segment. All restoration actions would further enhance scenic characteristics in this segment.

## Segment 4 – El Portal (Recreational Segment)

### *Geological/Hydrological ORV-7 – The Boulder Bar in El Portal*

Natural processes would continue to shape the landscape and the geologic ORV. The NPS has not identified any management considerations with respect to the El Portal boulder bar. Land use and facility actions proposed in this alternative would not affect this ORV. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection are necessary. Moreover, the types and levels of visitor and administrative use (e.g., housing, maintenance operations, office space, passive recreation) allowed under this alternative would not affect this ORV. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

**Conclusion:** Under Alternative 2, the geologic values of this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no actions that would affect the boulder bar in El Portal, and there are no ongoing concerns or considerations associated with this resource.

### *Cultural ORV-11 – The El Portal Archeological District*

The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region. Four sites are known to have experienced particularly severe damage, most notably a large ancient village and cemetery.

To address management considerations pertinent to this river value, the NPS would undertake the following actions:

- Protective measures would ensure that exceptional sites would be protected from unmitigated effects that could lead to adverse effects or degradation on a segmentwide level. A plan of action for addressing the abandoned infrastructure on sites would be developed in consultation with traditionally-associated American Indian tribes and groups. Any solution(s) developed would also include a recommended approach for deterring visitor use within the sites.

- Informal trails, non-essential roads, and abandoned infrastructure would be removed to protect and enhance the archeological resources contributing to the ORV in Segment 4.
- Remove informal trails and non-essential roads.

There are no existing instances of adverse effect or degradation to this ORV. As discussed above, management considerations are present associated with abandoned infrastructure that remains on an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians. Management considerations are also associated with non-essential roads and trails that impact archeological sites. In recognition of the high cultural significance of these sites, this alternative requires the park to develop plans to remove abandoned infrastructure and non-essential roads. Restoration actions to establish a 2.5 acre recruitment area for Valley Oaks would further protect adjacent archeological resources. Construction of employee housing in Old El Portal, Abbieville, and Rancheria would be designed to avoid or mitigate threats and disturbances to archeological sites. Monitoring and protective measures would ensure that new use patterns associated with the new housing would not affect contributing elements of the El Portal Archeological District.

**TABLE 8-70: SEGMENT 4 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-11**

Location	Action in Alternative 2	Effects to ORV-11
<b>El Portal</b>		
Abbieville, Old El Portal, and Rancheria Flat Concessioner Employee Housing	New employee housing in Abbieville (405 beds), Old El Portal (12 beds), and Rancheria Flat (9 beds).	Exact location for housing would avoid sensitive resources. Mitigation measures would protect cultural resources during construction. Ongoing monitoring and protective measures would ensure that use patterns associated with new housing would not affect contributing elements of the Archeological District. The ORV would continue to be protected segmentwide.
Abbieville Trailer Park Area	No new parking spaces added at the Abbieville/Trailer Park area.	Mitigation measures would protect cultural resources during facility removal and ecological restoration. Change would continue to protect archeological resources locally.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Mitigation measures would protect cultural resources during facility removal and ecological restoration. Change would continue to protect archeological resources locally.

**Conclusion.** Under Alternative 2, the archeological resources in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of abandoned infrastructure, informal trails and non-essential gravel roads would enhance protection of archeological resources. Valley Oak restoration actions would protect adjacent archeological resources from further ground disturbance. Construction of new employee housing would be designed to avoid or mitigate effects to the El Portal Archeological District. New or altered visitor use patterns associated with the new housing development would be monitored and protective actions would occur if effects triggered responses.



## Segment 5 – South Fork Merced River Above Wawona (Wild Segment)

### *Biological ORV-1 – High-elevation Meadows and Riparian Habitat*

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Restoration actions to remove informal trails and charcoal rings to protect cultural resources proposed under this alternative would not affect high-elevation meadows. The NPS proposes no major facility or visitor use actions for Segment 5 under Alternative 2. The biological ORV in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level.

### *Cultural ORV-12 – Regionally rare archeological features representing indigenous settlement including archeological sites with rock ring features*

Three regionally rare prehistoric archeological sites are located along this segment of the South Fork of the Merced Wild and Scenic River corridor. The sites contain unique stacked rock ring constructions and rock alignments. Two sites also contain pine timber remains within the ring interiors or incorporated into the stacked rock courses. Rock constructions are considered fragile and highly subject to human alteration from camping and campfire building disturbances. Two of the South Fork sites are adjacent to formal NPS trails, increasing the likelihood of disturbance. The vicinity of the sites has not been systematically surveyed, and it is possible that additional rock ring sites may be present along the South Fork. Should additional rock ring sites be discovered in the monitoring process, they would also become a part of the South Fork ORV. To remedy these considerations, NPS would:

- Complete documentation of the features. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker). Remove informal trails and charcoal rings.
- Increase education and outreach to Wilderness travelers.

**Conclusion.** Under Alternative 2, the archeological resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no specific actions to manage user capacity, land use, and/or facilities under Alternative 2 within Segment 5 beyond those designed to protect and enhance ORV-12 that would impact components of Cultural ORV-12. Monitoring activities described in Chapters 5 and 8 would continue to protect and enhance Cultural ORV-12 to ensure there are no adverse effects or degradation to ORV-12 on a segmentwide basis.

### *Scenic ORV 18 – Scenic Wilderness Views along the South Fork Merced River*

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

**Conclusion.** Under Alternative 2, the scenic resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. The scenic ORV for Segment 5 is

determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## Segment 7 – Wawona (Recreational Segment)

### *Biological ORV-3 – The Sierra sweet bay (Myrica hartwegii)*

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV would be determined by comparing populations located near Wawona Campground (an area that is likely to be disturbed by humans) with more remote populations that are less likely to receive such disturbance. This population of Sierra sweet bay is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

**TABLE 8-71: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR BIOLOGICAL ORV-3**

Facility	Action in Alternative 2	Effects to ORV-3
<b>Wawona</b>		
Wawona Campground	Retains 67 sites and one group site. Remove 32 sites that are either within the 100-year floodplain or in culturally sensitive areas.	Action would improve the condition of the ORV by reducing the potential effects on this species associated with campground visitation. The ORV would continue to be protected locally.

To ensure that this biological ORV is protected and enhanced through time, the NPS would monitor the condition of the Sierra sweet bay population to ensure early warning of conditions that require management action before impacts occur.

Conclusion. Under Alternative 2, the Sierra Sweet Bay in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Reduction in camping and visitor activity in the vicinity of Wawona Campground would enhance this resource.

### *Cultural ORV-13 – Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This district spans segments 5, 6, 7, and 8. Accordingly, the condition of this historic property is assessed at the property-level, rather than the segmentwide level. Segment 7 includes the remains of the U.S. Army Cavalry Camp A. E. Wood documenting the unique Yosemite legacy of the African-American buffalo soldiers and the strategic placement of their camp near the Merced River. There are several management considerations for this ORV: the Wawona Archeological District is subject to site-specific impacts from park operations, visitor use, artifact collection, vandalism, and ecological processes. The following actions would help to address these issues:

- Increase monitoring frequency at affected sites.

- At the district-wide level, revise the existing National Register nomination to reflect changes since its original writing, for example, incorporating newly discovered resources and documenting impacts.
- The Wawona Campground capacity would be reduced to 67 sites (including one group site). 32 sites are removed because they are either within the 100-year floodplain or in culturally sensitive areas.
- Remove informal trails and fire rings to prevent continuing disturbance.
- Develop site management plans as needed for sites with complex uses. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds
- Consider need for archeological site treatment measures to address impacts to shallow deposits of artifacts and features.

**TABLE 8-72: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-13**

Facility and Land Use	Action in Alternative 2	Effects to ORV-13
<b>Wawona</b>		
Wawona Campground Septic System	Remove septic system, and connect to the sewer system. Build a lift station above the campground to connect to the existing water treatment plant.	Mitigation measures would protect cultural resources during facility construction. The ORV would be protected locally.
Wawona RV dump site	Relocate the dump site to an appropriate location away from the river.	Mitigation measures would protect cultural resources during facility removal and construction. The ORV would be protected locally.
Wawona Store	Replace the existing public restroom facilities with larger restrooms to accommodate visitor use levels. Improve picnic area, redesign bus stop.	Mitigation measures would protect cultural resources during facility construction. The ORV would be protected locally.
Wawona Swinging Bridge	Provide access to Swinging Bridge with access on the south side of the river, delineate trail, restrooms, waste disposal and parking.	Mitigation measures would protect cultural resources during facility construction. Restrooms and waste disposal will reduce threats and disturbances to adjacent archeological resources. The ORV would be protected locally.

The NPS would delineate trails, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; conduct public education to discourage disturbance to sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

### ***Cultural ORV-14 – Wawona Historic Resources***

The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity. The Wawona Covered Bridge is in good condition, and there are no current management considerations associated with it, however the bridge requires maintenance to keep the historic structure in good condition in the face of adverse weather and visitor use.

The Wawona Hotel complex continues to serve its original purpose as a guest lodging facility. Management considerations related to the hotel complex involve concessioner operations, the need for regular and routine preservation maintenance, and periodic rehabilitation to ensure visitor safety.

- Regular and routine preservation maintenance, conducted in accordance with the Secretary of the Interior’s Standards, would ensure that this upkeep protects the historic character of the buildings
- Periodic rehabilitation would involve subject-matter specialists in planning, design and implementation to ensure actions do not compromise the historical integrity of the complex
- Concessioner operations would ensure that any operational modifications or updates are appropriate and in keeping with the historic character of the complex.

To prevent future impacts, the NPS would monitor the condition of the bridge, and take specific actions should conditions exceed trigger points. Trigger points are selected to inform managers well in advance of adverse effects or degradation on the Wawona Covered Bridge. Management considerations for the Wawona Hotel complex include the need for regular and routine preservation maintenance, periodic rehabilitation, and ongoing operations that serve its continuing function as a historic lodging facility. To address these management considerations, the NPS would ensure that these activities would conform to the Secretary of the Interior’s Standards for Treatment of Historic Properties.

**TABLE 8-73: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR WAWONA HISTORIC RESOURCES ORV-14**

Facility	Action in Alternative 2	Effects to ORV-14
<b>Wawona</b>		
Wawona Hotel	Retain 104 lodging units at the Wawona Hotel. Retain hotel restaurant and swimming pool. Wawona golf course and shop would be removed to accommodate ecological restoration, though the spray field would remain. The Wawona Hotel Tennis Court would also be removed under this alternative.	The action would retain contributors to the Wawona Historic Resource. The golf course and golf shop are not components of the ORV and their removal would not affect the condition of the Wawona Historic Resource river value. The ORV would continue to be protected locally.

## Segment 8 – South Fork Merced River below Wawona (Wild Segment)

### *Biological ORV-3 — The Sierra sweet bay (Myrica hartwegii)*

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV in Segment 8 is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

### *Cultural ORV 13— Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This ORV in Segment 8 is in good condition, with no management considerations present. Management actions are not required at this time.

### ***Scenic ORV-18 – Scenic Wilderness Views along the South Fork Merced River***

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

The scenic ORV for Segment 8 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## **ALTERNATIVE 3**

### **River Value – Free-flowing Condition in all Segments**

A free-flowing river, or section of a river, moves in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis. Riprap revetment, abandoned infrastructure within the bed and banks of the river, and bridges that constrict the flow of the river may produce localized effects on free-flowing condition of the river. Alternatives 2-6 would enact a comprehensive suite of actions to enhance the free-flowing condition of the river by removing 3,400 linear feet of riprap, and removing abandoned and unnecessary infrastructure from the river channel and its floodplain. Infrastructure that would be removed includes former sewage treatment facilities, sewer and water lines, and former bridge abutments. In addition, Alternative 3 would remove an additional 435 feet of riprap from riverbank areas, beyond that proposed for removal under Alternatives 2-6.

Alternative 3 also proposes removal of Stoneman, Ahwahnee, and Sugar Pine bridges, which produce hydraulic constrictions that lead to accelerated erosion and prevent natural channel migration during high-water events. The removal of the three bridges would help achieve the robust ecological restoration principles that guide Alternative 3.

There are no new facilities proposed under Alternative 3 that would affect the free-flowing condition of the river. A number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/Geological ORVs). For example, the Yosemite Village Day-use Parking Area would be relocated north outside the 10-year floodplain.

To protect the river's free flowing condition, the NPS would require all projects involving construction within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSR. Through this process, the NPS would ensure that water resources projects within the designated river corridor would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition.

**Conclusion:** The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis, although localized considerations such as intermittent riverbank and bridges that constrict the flow of the river are present. Alternative 3 proposes a comprehensive suite of actions to enhance the free-flowing condition of the river by removing riprap, removing unnecessary infrastructure in the river channel, and removing three bridges that produce pronounced hydraulic constrictions at high water flows. There are no new facilities proposed under Alternative 3 that would affect the free-flowing condition of the river within the river channel, and a number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/ Geological ORVs). The NPS would require all proposed projects within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSR to ensure that water resources projects would not lead to “direct or adverse effects” on free flow, and that projects on tributaries to the river do not “invade or unreasonably diminish” the river’s free flowing condition. The actions proposed under Alternative 3 ensure that there are no direct or adverse effects on free-flowing condition of the Merced River.

## **River Value- Water Quality (All Segments)**

The water quality of the Merced River is extremely high, and the current water quality of the river is fully protected and enhanced on a segmentwide basis. Intermittent local instances of contamination may occur in connection with surface water runoff from parking areas, recreational vehicle dump stations in proximity to the river, and accelerated erosion with potential sediment loading in the river during high water flows. Alternatives 2-6 would apply mitigation measures to ensure that surface water runoff associated with parking areas protects the water quality of the Merced River and meets regulations. The Upper Pines and Wawona recreational vehicle dump stations would be moved away from the river, and the Odger’s bulk fuel storage area in El Portal would be moved out of the 500-year floodplain. In addition, Alternative 3 would relocate the Yosemite Village Day-use Parking Area outside the 10-year floodplain. All campsites and infrastructure currently within 100-feet of the river would be removed. The pack trail from Curry Village stables to Happy Isles would be re-routed farther away from the river. These actions would reduce result in less erosion along the riverbank, reduce use in sensitive areas, direct use to resilient areas, and mitigate potential sources of pollutants.

Large-scale ecological restoration actions would take place along the riverbank and floodplain of the Merced River. These actions would enhance water quality, particularly the actions that re-establish riverbank vegetation and reduce erosion potential. Ecological restoration actions are described in more detail in the discussion of the biological ORVs below and in Appendix E.

There are no new facilities proposed under Alternative 3 that would affect the water quality of the river. To maintain excellent water quality, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

**Conclusion:** Under Alternative 3, water quality in all segments of the Merced River corridor would continue to be absent of adverse effects and degradation, and the potential for localized instances of contamination would be strongly reduced. Alternative 3 would address localized water quality issues by



**TABLE 8-74: CORRIDOR-WIDE ACTIONS AND THEIR IMPLICATIONS FOR WATER QUALITY**

Location	Action in Alternative 3	Effects to Water Quality
<b>Segment 2</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	Campsites within the 100-year floodplain would be removed. Designated river access and put in areas established at resilient areas, discourage access to sensitive areas. Upper Pines dump station relocated away from the river.	These changes would result in less erosion along the riverbank; water quality would be enhanced segmentwide.
New campsites at Upper Pines, Backpacker's, and Camp 4.	New campsites constructed at Upper Pines, Backpackers, and Camp 4 out of the 150 foot riparian buffer.	Change would not result in additional water quality effects on a segmentwide level.
Yosemite Village Day-Use Parking Area	Move the unimproved parking lot out of the 10-year floodplain and restore the riparian habitat adjacent to the river.	Change would result in less erosion and storm water run-off from the parking area; water quality would be enhanced locally.
Pack Trail from Concessioner Stables to Happy Isles	Continue to provide staging at the Concessioner Stable for temporary pack camp operations; reduce the stable size.	Change would result in less erosion from the stock trail. Water quality would be enhanced locally.
Housekeeping Camp Lodging	Remove all 266 lodging units and associated facilities out of the 100-year floodplain; restore the floodplain to natural conditions.	Fencing and designated river access points would also direct use to resilient areas. Water quality would be enhanced locally.
<b>Segment 4</b>		
NPS Maintenance and Administrative Complex	Existing parking area formalized and paved using best management practices	Change would result in less erosion and storm water concerns in the parking area; water quality would be enhanced locally.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Removal of bulk fuel storage from the 500-year floodplain would further protect water quality segmentwide.
<b>Segment 7</b>		
Wawona Campground	Replace current septic system with waste water collection system connected to the waste water treatment plant. RV dump site relocated away from the river.	Change would result in less potential for storm water concerns in the campground; water quality would be enhanced locally.
Wawona Picnicking	Delineate boundaries of two formal picnic areas with formal river access points.	Change would result in less erosion along; water quality would be enhanced locally.

moving the Upper Pines and Wawona recreational vehicle dump stations away from the river, moving the Odger's bulk fuel storage area outside of the 500-yr floodplain, and applying mitigation measures to ensure surface water runoff associated with parking areas meets requirements. Large-scale riverbank restoration actions would decrease the potential for accelerated riverbank erosion and sediment loading during high water events. To ensure that existing high water quality conditions are maintained, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

## Segment 1 – Merced River above Nevada Fall (Wild Segment)

### *Biological ORV-1 – High-elevation Meadows and Riparian Habitat*

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity in Wilderness segments of the river corridor. Primary actions to protect and improve Biological ORV 1 include removal of informal trails in wet and sensitive habitats, and removal of trails that fragment or incise meadow habitat. This includes trails in Triple Peak Fork meadow, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and other areas as necessary. Removal of informal trails would reduce soil compaction and habitat fragmentation. Grazing capacities would be established, monitored, and adapted as necessary to reduce soil compaction and habitat fragmentation, and enhance meadow health.

Alternative 3 would convert the Merced Lake High Sierra Camp to a temporary pack camp with a maximum of 15 people per night and remove permanent infrastructure in the area, converting the area to designated Wilderness. Designated camping areas in Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Area would be converted to dispersed camping. Seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones would be applied. These changes would reduce concentrated use near the riverbank and improve

**TABLE 8-75: SEGMENT 1 ACTIONS AND IMPLICATION FOR BIOLOGICAL ORV-1**

Location	Action in Alternative 3	Effects to ORV-1
<b>Location</b>		
Meadow Trails	Remove informal trails that incise meadow habitat.	Change reduces effects to wet and sensitive meadows and results in localized enhancement to ORV-1.
Merced Lake High Sierra Camp	Convert to a temporary pack camp with a maximum of 15 people per night and remove permanent infrastructure in the area.	Changes reduce uses near riverbank which would result in localized enhancement of ORV 1 through reduction in erosion and trampling of riparian resources.
<b>Visitor Use Management Action</b>		
Private boating would be allowed in this segment	Boating would consist of short floats using pack raft or other craft that can easily be carried. Private use would be unlimited in this segment; however, boaters completing overnight trips would be subject to wilderness permit restrictions.	Limited numbers would protect riparian habitat from trampling and bank erosion that could result with unlimited access. Changes would not affect high-elevation meadow and riparian habitat, this ORV would continue to be protected on a segmentwide level.
Wilderness zone capacity	Zone capacities for Merced Lake, Washburn Lake, Mount Lyell, and Clark Range zones would remain the same across all the alternatives. Manage to a reduced capacity of 75 in the Little Yosemite Valley Wilderness Zone	Current zone capacities are designed to protect wilderness character including natural conditions such as riverbanks and meadows. Reduced capacity in LYV would result in localized enhancement of riparian habitat and thus this ORV.
Facilities retained	Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp	These facilities and associated administrative uses and maintenance do not affect riparian habitat or meadows.

riparian conditions in the immediate vicinity of these camping areas. Facilities that would remain in this segment of the river include the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the Biological ORV in this segment indicates that these facilities are not adversely affecting the Biological ORV.

The NPS would monitor three indicators to assess the condition of this ORV: meadow bare soil, meadow fragmentation due to the proliferation of informal trails, and streambank stability. The NPS would establish a baseline for all three indicators using site-specific monitoring protocols by 2013. Regular monitoring would also assess whether assumptions about human behaviors and actions taken to correct past impacts are sustaining conditions above the management standard. The meadow monitoring programs for the biological ORV would monitor meadow fragmentation to ensure that use levels from hikers, backpackers and stock users do not result in meadow fragmentation or bare ground in excess of the management standards prescribed to protect and enhance meadows. If conditions reach trigger points, the NPS would implement specific response actions (as described in Chapter 5) to ensure this ORV is protected and enhanced through time.

**Conclusion:** Under Alternative 3, the biological ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The removal of inappropriate informal trails in meadows and establishment of grazing capacities would enhance meadow conditions. The conversion of the High Sierra Camp to a temporary pack camp with a maximum of 15 people per night, and conversion of designated camping areas to dispersed camping, would reduce concentrated use along riverbanks and reduce trampling in riparian habitat. There are no new facilities proposed under Alternative 3 that would affect meadow and riparian habitat. These actions proposed under Alternative 3 would protect and enhance Biological ORV-1 and segmentwide would achieve the robust ecological restoration principles that guide Alternative 3.

### ***Geological/Hydrological ORV-4 – Glacially-carved Canyon in the Upper Merced River Canyon***

As discussed in Chapter 5, there are no management considerations with respect to the U-shaped, glacially carved canyon above Nevada Fall. This ORV is currently protected and enhanced within the meaning of the Wild and Scenic Rivers Act. Alternative 3 does not propose any actions that would change the condition of this ORV over time. Further, the U-shaped, glacially carved attributes of this ORV would not be affected by the types and levels of use authorized under this alternative, which are all directed toward wilderness oriented recreation. The NPS would nevertheless monitor the condition of this ORV to ensure that its condition does not decline.

### ***Scenic ORV-15 – Scenic Views in Wilderness***

Visitors to this Wilderness segment experience scenic views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks. Management considerations associated with the condition of the scenic river above Nevada Fall include contributions of regional air pollution (primary factors contributing to this condition are outside of NPS jurisdiction), visual intrusions of temporary and permanent structures, and crowding in and near wilderness campgrounds. There are few “visual intrusions” noted beyond the High Sierra Camp and other designated camping areas. However, these effects are local in nature and do not

degrade the ORV on a segment wide basis. The NPS would ensure that the Merced Lake High Sierra Camp and designated camping areas are maintained in a clean and tidy condition. Under Alternative 3, the High Sierra Camp would be converted to a temporary pack camp with a maximum of 15 people per night. This change would return scenic views to be keeping with the native landscape. These measures would locally enhance the scenic ORV. Other visitor use management actions under Alternative 3 would reduce crowding, thus additionally enhancing this ORV on a segmentwide basis.

As described in the Baseline Condition Report, the ORV is determined to be in the protected state, as defined by an absence of adverse effects and degradation, although intermittent air quality concerns are present. Because of the ambient nature of air quality, it cannot be managed exclusively for the river corridor. Facilities that would remain in this segment of the river include the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the scenic ORV in this segment indicates that these facilities are not adversely affecting the scenic ORV.

**TABLE 8-76: SEGMENT 1 ACTIONS AND IMPLICATION FOR SCENIC ORV-15**

Location	Action in Alternative 3	Effects to ORV-15
Merced Lake High Sierra Camp	Convert the Merced Lake High Sierra Camp to a temporary pack camp with a maximum of 15 people per night. Remove permanent infrastructure, converting the area to designated Wilderness.	Change would locally enhance ORV because the reduced infrastructure that remains would better blend in to the natural environment.
Merced Lake Backpackers Camping Area and Little Yosemite Valley Camping Area	Converted to dispersed camping area.	Element currently does not cause adverse effects or degradation to ORV on a segment wide basis, thus ORV would continue to be locally protected in this area.
Facilities retained	Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp	These facilities and associated administrative uses and maintenance do not result in segmentwide adverse effects to scenic values. The ORV will continue to be protected on a segmentwide level.

**Conclusion:** Under Alternative 3, the scenic ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance scenic values in this segment. Conversion of the Merced Lake High Sierra Camp to a smaller temporary pack camp would address scenic considerations in this segment, which focus on the High Sierra Camp and thereby enhance the scenic ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures.

### ***Recreational ORV-19 – Wilderness Recreation above Nevada Fall***

Visitors to federally designated Wilderness in Segment 1 would engage in a variety of river related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the Wilderness experience. The current condition of this ORV is at or above the management standard at the segment level. Localized management concerns in this segment relate to crowding at Little Yosemite Valley and Moraine Dome backpackers campgrounds, high use levels at the Merced Lake Backpackers Camping Area, and high encounter rates along the trails that connect these areas. Crowding and high use levels affect the Wilderness experience, which is an integral part of the recreational ORV in this segment.

This alternative would convert the Merced Lake High Sierra Camp to a temporary pack camp with a maximum of 15 people per night and remove permanent infrastructure, converting the area to designated Wilderness. The capacity of the Little Yosemite Valley Wilderness Zone would be reduced to 75, and the footprint of the camping area would be reduced accordingly. Designated camping areas in Moraine Dome and the Merced Lake Backpackers Camping Area would be converted to dispersed camping. This would give backpackers an opportunity to camp outside of close proximity to other backpackers. Actions in Alternative 3 would apply additional seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones. These changes would reduce use crowding, high use levels, and increase opportunities for solitude in this Wilderness segment.

**TABLE 8-77: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR RECREATION ORV-19**

	Action in Alternative 3	Effects to ORV-19
<b>Location</b>		
Merced Lake High Sierra Camp	Convert the Merced Lake High Sierra Camp to a temporary pack camp with a maximum of 15 people per night. Remove permanent infrastructure, converting the area to designated Wilderness.	The undeveloped and primitive elements of wilderness character are enhanced on a segmentwide level by this camp reduction.
Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Areas	Designated camping areas would be converted to dispersed camping.	The solitude and primitive elements of wilderness character would be enhanced due to the opportunity to camp out of sight and sound of other campers.
Segmentwide River Access	Swimming and water play allowed. No permits required for private boating. No commercial boating	Permitted use and commercial limits would not substantively change current recreational use or recreational values in the segment. Recreational values would continue to be protected segmentwide.
<b>Visitor Use Management Action</b>		
Private boating	Boating would consist of short floats using pack raft or other craft that can easily be carried. Private use would be unlimited in this segment; however, boaters completing overnight trips would be subject to wilderness permit restrictions.	Permitted use would not substantively change current recreational use or recreational values in the segment. Recreational values would continue to be protected segmentwide.
Wilderness zone capacity	Zone capacities for Merced Lake, Washburn Lake, Mount Lyell, and Clark Range zones would remain the same across all the alternatives. Manage to a reduced capacity of 75 in the Little Yosemite Valley Wilderness Zone	Zone capacities are designed to protect recreational setting attributes and recreational experience quality. Reduced capacity in LYV would result in localized enhancement of recreational values in the wilderness.

Facilities that would remain in this segment of the river include the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. These facilities do not have an adverse effect on the Wilderness experience integral to this Recreational ORV.

NPS would monitor visitor encounter rates to ensure that they are not exceeding established standards. Should specific trigger points be reached, the NPS would be required to implement a series of specific actions to reduce visitor levels to an acceptable level. These actions increase in severity as the current condition ORV condition moves away from the management standard to ensure proper course correction and re-establishment of the management standard. These trigger points were selected to inform managers in advance of any adverse effects or degradation to this ORV.

**Conclusion:** Under Alternative 3, the recreational ORV in Segment 1 of the Merced River corridor would be protected on a segmentwide basis and continue to be absent of adverse effects and degradation on a segmentwide level. Although actions under Alternative 3 would decrease the availability for visitors to pack in to wilderness (on horses or mules) conversion of backpackers campgrounds to dispersed camping, reductions in the zone capacity for Little Yosemite Valley, and conversion of the Merced Lake High Sierra Camp to a smaller temporary pack camp would address management considerations by reducing crowding, high use levels, and increasing opportunities for solitude.

## Segment 2 – Yosemite Valley (Recreational and Scenic Segments)

### *Biological ORV-2 – Mid-elevation Meadows and Riparian Habitat*

The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada. Actions to protect and enhance Biological ORV-2 under Alternative 3 include:

- Removal of informal trails in meadows where they fragment meadow habitat or cross through sensitive, wet vegetation communities. Overall, restore six miles of informal trails throughout Yosemite Valley;
- Use boardwalks or hardened surfaces to allow access to sensitive areas;
- Delineation of trails through upland areas and along meadow perimeters;
- De-compacting trampled soils and consolidate multiple parallel trails;
- Re-directing visitor use to more stable and resilient river access points such as sandbars, and designate formal river access sites. Establishing fencing and signage to protect sensitive areas; install boardwalks where appropriate, and actively revegetate where needed;
- Relocate or remove all campsites within the 100-year floodplain;
- Restoration of the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest at specific locations in Yosemite Valley. Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure re-design. Alternative 3 would include 302 acres ecological restoration.
- Day use parking capacity is expanded and formalized. A total of 1,597 visitor parking spaces would be provided in the Valley accommodating a maximum of 5,328 people at one time to Segment 2. Managing access and other proactive restoration measures would protect Biological ORVs by during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Biological ORVs by removing these uses from the river corridor and managing access in the corridor.

This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Under this alternative, all roads, buildings, campgrounds, trails, utilities and infrastructure, and other facilities in this segment with current local effects on the biological ORV would be removed, reduced, or relocated, including portions of Yosemite Lodge. Facilities that would remain in this segment of the river, including the Ahwahnee Hotel have no direct impact on the



**TABLE 8-78: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2**

Location	Action in Alternative 3	Effects to ORV-2
Segmentwide Restoration	Restoration includes restoration of meadow habitat, removal of informal trails, riparian restoration and establishment of designated river access points, and use of boardwalks and hardened surfaces.	Actions would enhance the biological ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within the 100-year floodplain would be removed. Designated put in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be discouraged; the biological ORV would be enhanced segmentwide.
New campsites at Upper Pines, Backpackers, and Camp 4.	New campsites constructed at Upper Pines, Backpackers, and Camp 4 out of the 100 year floodplain.	Actions would protect riparian areas from direct impacts related to the increase in visitor activity in these areas. Fencing and designated river access points would also direct use to resilient areas. Monitoring would proactively assess the effectiveness of these actions and established triggers to ensure that future protective measures are implemented in a timely manner. Change would result in protection of biological ORV in this segment.
Stoneman Meadow and Curry Orchard parking lot	Removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. The Orchard Parking Lot would be re-designed. Remove apple trees and landscape with native vegetation. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	These changes would promote water flow and improve meadow health thereby enhancing the biological ORV locally.
Ahwahnee, Sugar Pine and Stoneman Bridges	Remove the Ahwahnee, Sugar Pine and Stoneman Bridges, and the associated berms and restore to natural conditions. Reroute the multiple use trail to the north bank of the river. Reroute utilities under Ahwahnee Bridge.	Change would reduce channel widening, erosion, and scouring thereby enhancing local riparian communities.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center Parking Area/	Move the Yosemite Village Day Use Parking Area out of the 100-year floodplain to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	These changes would reduce effects to riparian corridor and enhance ORV components as use would be relocated away from areas critical to river or meadow function. The ORV would be enhanced locally.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	These changes would reduce effects to riparian corridor and enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
Ahwahnee Row and Tecoya Dorms Concessioner Housing	Retain housing. Create 50-foot setback from Indian Creek – ecologically restore the riparian habitat and protect by restoration fencing.	These changes would remove uses from the riverbank thus reducing erosion and trampling impacts in riparian corridor and enhancing ORV components locally.

**TABLE 8-78: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2 (CONTINUED)**

Location	Action in Alternative 3	Effects to ORV-2
<b>Yosemite Village and Housekeeping Camp (cont.)</b>		
Northside Drive (Stoneman Bridge to Yosemite Village Day use Parking Area)	Remove 900' of road and relocate the bike path to the south.	These changes would improve meadow/river connectivity thereby enhancing the ORV locally.
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Drive and restore to natural conditions.	These changes would remove uses from the riverbank thus reducing erosion and trampling effects in riparian corridor and enhancing ORV components.
<b>Yosemite Lodge and Camp 4</b>		
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Relocation of this facility outside of the river corridor may reduce informal trailing in the adjacent meadow thereby enhancing the ORV locally.

biological river value as indicated in the baseline condition assessment. Effects to the free-flowing condition of the river as a result of the bridges that would remain under this alternative would be mitigated through constructed log jams.

Some associated facilities are proposed for relocation as described below.

The NPS would monitor three indicators to assess the condition of ORV 2: meadow fragmentation resulting from informal trails, the status of riparian habitat, and riparian bird abundance. As described in Chapter 5, adverse effects and degradation are not present in relation to the meadow fragmentation indicator. Management concerns in meadows are present; however, actions to address informal trailing impacts and fragmentation would be taken at all meadows where these concerns have been documented. Initial surveys of the riparian status indicator in 2010 indicate that degradation is not present, but management concerns are also present in the riparian corridor.

The NPS is beginning to monitor the third indicator in this segment, riparian bird abundance. The first status assessments would take place in 2013, after one year of monitoring. The next assessment requires information from two out of three years.

To ensure Biological ORV-2 is protected by this plan and protected and enhanced through time, the NPS would continue to monitor the condition of the ORV to provide early warning of conditions that require management action before impacts occur. Regular monitoring would also reveal whether conditions have reached trigger points; and, if so, the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects.

**Conclusion:** Under Alternative 3, the biological ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance riverbanks and meadows. Removal or relocation of select campsites and infrastructure and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West

Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### ***Geological/Hydrological ORV-5 – The “Giant Staircase”***

The NPS has no immediate management considerations with respect to the Giant Staircase characteristic of the geology of Yosemite Valley above Happy Isles as this geologic ORV is determined to be absent of adverse effects and degradation. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### ***Geological/Hydrological ORV-6 – Rare, Mid-elevation Alluvial River***

As described in Chapter 5, the NPS selected the status of riparian habitat as the indicator to specifically assess the effectiveness of actions designed to protect this and other ORVs. This ORV integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities.

The following actions are included to specifically protect and enhance free-flowing conditions and the biological ORV in Segment 2, but would also address the protection and enhancement of the Geologic/Hydrologic ORV in Segment 2:

- Large wood, constructed log jams, and brush layering would be used in the vicinity of bridges to decrease bed scouring and streambank instability, river widening, river constrictions, and low channel complexity. Riprap would be removed where possible and replaced with native riparian vegetation, using bioengineering techniques. In the event that such actions do not improve conditions, bridge redesign or removal could be reconsidered.
- Under Alternative 3 the free-flowing condition of the river would be enhanced by removing the Ahwahnee, Sugar Pine, and Stoneman Bridges. Mitigation measures would be employed during removal and the long-term recovery of the removal areas is expected. Restoring free-flowing conditions would enhance riparian communities associated with ORV-6.
- Removing abandoned underground infrastructure, along the river corridor would be part of a comprehensive strategy to correct altered surface and subsurface hydrology.
- Remove riprap where riverbanks do not need stabilization to allow for channel migration. Replace riprap with bioengineered riverbanks, integrating native riparian vegetation, where riverbank stabilization is necessary for protection of critical infrastructure.
- Remove all campsites and infrastructure within the 100-year floodplain and restore natural floodplain and riparian habitat.
- Major restoration of the 100-year floodplain and restoration of the dynamic 10-year floodplain in East Yosemite Valley.

To ensure this ORV is protected and enhanced through time, the NPS would monitor the condition of the ORV using the status of riparian habitat as an indicator, and take specific actions should conditions reach trigger points.

**TABLE 8-79: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR GEOLOGICAL/HYDROLOGICAL ORV-6**

Location	Action in Alternative 3	Effects to ORV-6
<b>Curry Village and Campgrounds</b>		
Upper Pines, Camp 4 and Backpackers Campgrounds	<i>Upper Pines</i> : New RV campground loop with 36 sites <i>Camp 4</i> : 35 new walk-in sites east of existing Camp 4 <i>Backpackers</i> : 16 new walk-in sites west of existing Backpackers	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would not be permitted.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Lodging is outside the 100 year floodplain and is not causing adverse effects or degradation to ORV-6 on a segmentwide basis.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center Parking Area	Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	These changes would reduce effects to riparian corridor and locally enhance ORV components as use would be relocated away from areas critical to hydrologic function.
Ahwahnee Row and Tecoya Dorms Concessioner Employee Housing	Remove housing and development out of the 100-year floodplain, recontour topography, decompact soils, and restore stream hydrologic function.	Changes would result in reduction of residential activities in riparian areas; biological ORV would be enhanced locally.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	These changes would reduce effects to riparian corridor and enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	West of Yosemite Lodge re-developed to provide additional 550 day use parking spaces.	Implementation of mitigation measures would protect the floodplain from erosion and other disturbance during construction.
Yosemite Lodge Visitor Facilities	Remove 102 lodging units. Restore the 100-year floodplain.	Lodging is outside the 100-year floodplain and is not causing adverse effects
El Capitan Crossover	Facility retained. This roadway segment is a key connector between Northside and Southside Drives and serves as a exit point at west end of Yosemite Valley.	Bridge protects riparian habitat from destruction caused by random crossings throughout the river corridor
Northside Drive (Stoneman Bridge to Yosemite Village Day Use Parking Area)	Remove 900' of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Removes facility that currently has a localized effect on the ORV. Restoration enhances the ORV in this area.

**Conclusion:** Under Alternative 2, the geologic/hydrologic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would enhance the 10 and/or 100-year floodplains and this ORV. Actions to protect and enhance free-flowing conditions as well as meadows and riparian complexes in Segment 2 would result in additional enhancement of the geologic/hydrologic ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of

impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### *Cultural ORV-8 – Yosemite Valley American Indian Ethnographic Resources*

As described in Chapter 5, Yosemite Valley American Indian ethnographic resources include relatively contiguous and interrelated places that are inextricably and traditionally linked to the history, cultural identity, beliefs, and behaviors of contemporary and traditionally-associated American Indian tribes and groups. Management considerations related to ethnographic resources involve park operations, crowding, and visitor use. Actions included in the Merced River Plan/DEIS include:

- Continue coordination between traditionally associated American Indian tribes, groups, and traditional practitioners (through the Park American Indian Liaison) with law enforcement, fire management, interpretation, invasive species, ecological restoration, and facilities management programs;
- Continue to provide operational guidelines for material staging areas, parking, etc. to protect ethnographic resources;
- Ensure access for traditionally-associated American Indians for participation in annually scheduled traditional cultural events. In addition, tribal access for the personal conduct of ongoing traditional cultural practices would be assured through the Yosemite tribal fee waiver pass program.
- Reduce and formalize day-use parking capacity Manage access in Segment 2 to protect traditionally-used plant populations in the river corridor during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Cultural ORVs by removing these uses from the proximity of several cultural resources.

Threats to traditionally-used plant populations include invasive species such as Himalayan Blackberry (*Rubus armeniacus*), drainage and hydrology impacts to meadows, and erosion and revetments that affect riparian vegetation. The *Merced River Plan/DEIS* would address these considerations through the following actions:

- The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program would address impacts to some traditionally-used plant populations in some locations.
- Restoration actions to protect riparian areas, meadows, and hydrological resources would further contribute to the protection and enhancement of the traditional-use plant communities included in this ORV.
- Introduction of seedlings to affected stands of black oaks and protection as necessary to ensure that ratios of adults to saplings is at least 0.65.
- Primary actions to manage major vista points under Scenic ORV-16 include mechanical thinning or removal of conifer trees. This action would be coordinated to ensure that the ORV-8 trigger point for the ratio of sapling to adult trees is not exceeded.

**TABLE 8-80: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR CULTURAL ORV-8**

Location	Action in Alternative 3	Effects to ORV-8
<b>Curry Village and Campgrounds</b>		
Traditional Cultural Property Documentation	Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary	Documentation, mapping, and evaluation would provide the detail necessary to protect and enhance the ORV segmentwide.
Visitation	13,200 people per day	This level of visitation may continue to result in a lack of privacy for traditional cultural practices in particular locations seasonally. Access to annually-scheduled traditional cultural events and personal conduct of traditional cultural practices would be assured thereby continuing protection of the ORV segmentwide.
Upper Pines, Backpacker's, and Camp 4 Campgrounds	All campsites within 100 feet of the river would be removed. New campsites constructed at Upper Pines, Backpacker's, and Camp 4. Designated put in areas for boating established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged. The ORV would be enhanced segmentwide.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Lodging is outside the 100 year floodplain and is not causing adverse effects or degradation to ORV-6 on a segmentwide basis.
<b>Yosemite Village and Housekeeping Camp</b>		
Housekeeping Camp Lodging	Remove 266 lodging units, out of the observed ordinary high water mark.	These changes would reduce effects to riparian corridor and locally enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Mitigation measures would protect vegetation and traditional use plants locally. Increased use in this area would be monitored to ensure protection of ethnographic resources. Additional parking near Wauhoga would increase access to traditional uses at this location. The ORV would continue to be protected locally.
Yosemite Lodge Parking	25 additional spaces added at Yosemite Lodge due to redesign, improving parking efficiency near Northside Drive.	Implementation of best management practices would protect the floodplain from erosion and other disturbance. Additional parking near Wauhoga would increase access to traditional uses at this location. The ORV would continue to be protected locally.
Yosemite Lodge Visitor Facilities	Removing 102 units.	Lodging is outside the 100 year floodplain and is not affecting the ethnographic resources. Reduced visitor use near Wauhoga would increase privacy for traditional uses at this location. The ORV would continue to be protected locally.



**TABLE 8-80: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR CULTURAL ORV-8 (CONTINUED)**

Location	Action in Alternative 3	Effects to ORV-8
<b>Yosemite Lodge and Camp 4 (cont.)</b>		
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Lodging is outside is not affecting ethnographic resources. The ORV would continue to be protected locally.
Former Bridalveil Sewer Plant	Remove the buried structure.	Removal of the abandoned infrastructure and native plant revegetation will allow for recruitment of desirable black oaks in this area. The ORV would continue to be enhanced locally.
Yellow Pine Administrative Campground	Retain 4 group administrative use sites (up to 120 people).	Yellow Pines is used for overflow camping during annual traditional cultural events. Retention of this campground continues to protect the ORV segmentwide.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Relocation of this facility outside of the river corridor may reduce informal trailing in the river corridor. Restoration will allow for recruitment of desirable black oaks in this area. The ORV would be enhanced locally.

Facilities that would remain in this segment of the river have no direct impact on the ethnographic component of the cultural ORV as indicated in the baseline condition assessment.

The Merced *River Plan/DEIS* proposes a variety of actions to address specific considerations including continued coordination between traditionally associated American Indian tribes, groups, and traditional practitioners and the NPS; continued access for traditionally associated American Indians for participation in annually scheduled traditional cultural events; and ecological restoration actions to protect and enhance traditionally used plant populations. To prevent future impacts, the NPS would monitor the condition of the ORV, and take specific actions should additional trigger points be exceeded.

**Conclusion:** Under Alternative 3, the ethnographic component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Actions to protect and enhance floodplains, meadows and riparian complexes in Segment 2 would result in additional enhancement of the traditionally-used plant resources of the ethnographic component of the cultural ORV. Actions that would remove infrastructure and restore black oak woodlands would also enhance a critical component of this ORV. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would not limit access to traditional practitioners because measures would be in place to ensure access to annually-scheduled events as well as individual access for ongoing traditional cultural practices. Furthermore, the overall reduction in visitation under Alternative 3 would reduce the effects of crowding and enhance privacy for traditional cultural practices.

### ***Cultural ORV-9 – Yosemite Valley Archeological District***

The Yosemite Valley Archeological District is a linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River. Heavily-used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling stock trail

use, parking and informal rock climbing can all affect ORVs in this area. Archeological resource protection would be achieved through actions in this plan to manage visitor use levels, divert foot traffic around sites, removing informal trails, and formalizing river and meadow access locations, mitigating ecological restoration practices by using noninvasive techniques wherever possible. Many of the actions related to ecological restoration in Segment 2, such as delineating roadside parking, would also help protect archeological sites by diverting foot traffic away from sites and into less sensitive areas. Actions to enhance the recreational ORV in Segment 2 would manage recreational users both in terms of flow and location of users at any one time. A reduction in people and vehicles at one time in Yosemite Valley could also reduce visitor use-related effects on archeological resources.

Site-specific treatment actions would be developed through site management plans, where necessary, to avoid resource loss through park actions (such as development, repair, and maintenance of facilities and underground utilities to support visitor use or natural forces).

Management considerations for this ORV also involve continuing to survey and monitor archeological resources as well as update required documentation.

Under Alternative 3 the free-flowing condition of the river would be enhanced by removing the Ahwahnee, Sugar Pine, and Stoneman Bridges. Mitigation measures would be utilized to reduce localized impacts and ensure that this action would not cause adverse effects or degradation to ORV-9 on a segmentwide basis. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Facilities that would remain in this segment of the river have no direct impact on the archeological component of the cultural ORV as indicated in the baseline condition assessment.

The NPS would delineate bike paths, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; remove graffiti at rock art and other sensitive features, conduct public education to discourage climbing, and remove climbing hardware from sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

**Conclusion:** Under Alternative 3, the archeological component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Localized visitor-use-related impacts to archeological resources would be addressed through various enhancement actions. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would reduce the potential for visitor use impacts.

**TABLE 8-81: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9**

Location	Action in Alternative 3	Impact on ORV-9
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines, and Backpackers Campgrounds	All campsites within 100-year floodplain would be removed. Upper Pines Campsite in culturally sensitive area.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Concessioner Stables	Concessioner Stable for temporary pack camp operation at Merced Lake High Sierra Camp; reduce the stable size	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would protect cultural resources during facility removal and would locally protect the ORV. Change would not affect contributing element of the Archeological District.
The Ahwahnee Parking Lot	Redesign and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Yosemite Village Day-use Parking Area	The Concessioner General Offices, Garage, and the Bank Building are removed. Move the Yosemite Village Day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Yosemite Village Concessioner Employee Housing	Temporary housing at Huff House and Boys Town is removed. Remove housing units (7 buildings, 64 beds) in rock fall hazard zone. Construct 16 buildings, housing 164 employees using the same dormitory prototype. Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Dr. and restore to natural conditions.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
<b>Yosemite Lodge and Camp 4</b>		
West of Yosemite Lodge New Parking	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.

**TABLE 8-81: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9 (CONTINUED)**

Location	Action in Alternative 3	Impact on ORV-9
<b>Yosemite Lodge and Camp 4 (cont.)</b>		
Yosemite Lodge Visitor Facilities	Remove all of the lodging units (-245 units). Repurpose the area outside the 100-year floodplain for Day Lodge and Parking. Restore the 100-year floodplain.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Change would not affect contributing element of the Archeological District due to location and level of use.
Yellow Pine, Camp 4, Yosemite Lodge, and West Valley Campgrounds.	Remove camping and restore the 100-year floodplain to natural conditions. Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Retain campground and administrative use sites in Yellow Pine.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Mitigation measures would protect cultural resources during facility relocation. Change would not affect contributing element of the Archeological District.
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Remove 900' of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.

### *Cultural ORV-10 – Yosemite Valley Historic Resources*

As described in Chapter 5, the Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system. Protective actions to address management concerns related to the Yosemite Valley Historic Resources ORV-10 include:

- Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to “good” condition.
- Develop a Historic Structures Report for the LeConte Memorial Lodge NHL to determine the rehabilitation needs to bring the building to “good” condition.
- Rehabilitate the Superintendent's House (Residence 1) per the Historic Structure Report (Lingo 2012) to bring the building to “good” condition. This rehabilitation of the building will occur under all action alternatives, regardless of whether the building is relocated.

Under Alternative 3 the free-flowing condition of the river would be protected by removing the Ahwahnee, Sugar Pine, and Stoneman Bridges. Relocation of the Superintendent's House (Residence 1) is proposed under Alternative 3 to address the 1982 Guidelines for the Wild and Scenic Rivers Act that requires managing agencies to consider relocation of major public use facilities outside

**TABLE 8-82: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-10**

Location	Action in Alternative 3	Effects to ORV-10
<b>Curry Village and Campgrounds</b>		
Stoneman Bridge	Remove bridge and restore to natural conditions, make Southside Drive two-way, and redesign Sentinel intersection.	The action would remove 2 contributors to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of these two bridges would not result in a segmentwide adverse effect of the collective of resources.
Stoneman Meadow and Curry Orchard parking lot	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	Change would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective.
Yosemite Village Day-Use Parking Area	Remove Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Re-align the intersection at Northside Drive and Village Drive. Add a three-way intersection at Sentinel Drive and the entrance to the parking area. Provide on-grade pedestrian crossings.	The removal of historic and non-historic properties and re-alignment/re-establishment of the intersections would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
Sugar Pine and Ahwahnee Bridges	Remove both bridges and the connecting berm.	The action would remove 2 contributors to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of these two bridges would not result in a segmentwide adverse effect of the collective of resources.
Superintendent's House (Residence 1)	Relocate outside the river corridor to the NPS housing area. Rehabilitate historic structure in new location.	The action would remove a contributor to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of this resource would not result in a segmentwide adverse effect of the collective of resources.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	The action would affect trails that are connected by the historic footbridges which are components of the Yosemite Valley Historic Resources ORV. Mitigation measures and Section 106 review would ensure the protection of the historic resources and the redesign could result in enhancement of the ORV locally.

of the river corridor. These three bridges and the Superintendent's House (Residence 1) are components of the Yosemite Valley Historic Resources component of the cultural ORV in Segment 2. The NPS would document and interpret any building or structure threatened with removal or relocation. In this manner, while the individual tangible element or elements may be lost or moved, a record of their existence and historical significance would still be available to the public.

To address management considerations, the *Merced River Plan/DEIS* proposes continuing the active program of maintenance for historic buildings and structures; employing existing design guidelines to ensure that new development or redevelopment complements the ORV and the Yosemite Valley Historic District; and periodically assessing and updating professional documentation for the historic resources.

Ecological and scenic value restoration actions in Segment 2 would enhance the cultural landscape which contributes to the historic setting of the resources that comprise the ORV-10. There are no construction actions associated with Alternative 3 that would affect the spatial organization of the historic resource collective, though changes in the circulation patterns as a result of re-routing roads at the Yosemite Village day-use parking area and at Stoneman Meadow would affect circulation patterns that are associated with this ORV. These effects would be localized and would not affect the condition of the ORV on a segmentwide level.

**Conclusion:** Under Alternative 3, the historic resources component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of three bridges and the relocation of the Superintendent's House (Residence 1) would result in localized effects that would be mitigated through documentation and interpretation. Once removed or relocated, these resources would no longer be considered part of the ORV collective. All disturbances to circulation and spatial organization associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and documentation (as needed) to ensure that historic resources are protected.

### ***Scenic ORV-16 – Iconic Scenic Views in Yosemite Valley***

Visitors to Yosemite Valley experience scenic views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls. Actions intended to manage natural resources may include the use of prescribed fire or controlled burns to thin forests that are encroaching on meadows; cutting trees, tree branches or other vegetation by mechanical means; and the application of herbicides to control invasive species. Related actions intended to protect the Recreation ORV would limit the number of visitors to lessen visitor density and congestion at attraction sites and make improvements to the transportation system that would reduce automobile congestion. Air quality can affect visitors' ability to experience scenic values in Segment 2. The NPS would cooperate with regional authorities to reduce airborne contaminants caused by combustion, including carbon dioxide emissions, smoke caused by fire, particulate matter generated by construction, and to improve air quality conditions.



**TABLE 8-83: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR SCENIC ORV-16**

Location	Action in Alternative 3	Effects to ORV-16
<b>Curry Village and Campgrounds</b>		
Select Scenic vista Points	Selectively thin conifers and other trees and shrubs that encroach on selected scenic vista points. Remove unnecessary facilities and ensure that all future development satisfies objectives that provide low contrast ratings.	Changes would enhance the scenic values on a segmentwide level.
Concessioner Stables	Reduce the Curry Village Stables area; eliminate commercial day rides. Remove associated housing (25 beds).	Currently not causing effects on scenic resources. Restoration would improve viewsheds.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Changes to Lodge would be in keeping with current facility and given the location of the facility would not interfere with iconic scenery.
Ahwahnee, Sugar Pine, and Stoneman Bridges	Remove the Ahwahnee, Sugar Pine, and Stoneman Bridges.	Given the location of the bridges, removal would not interfere with iconic scenery.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts	Given the location of the facility, changes to facilities would not interfere with iconic scenery
The Ahwahnee Parking Lot	Redesign and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking.	Given the location of the facility, changes to facilities would not interfere with iconic scenery
Yosemite Village Day Use Parking Area/Village Center Parking Area	The Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	Removal of buildings would enhance viewsheds locally.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	Removal of Housekeeping units near the river will enhance viewsheds locally.
Yosemite Village Concessioner Employee Housing	Temporary housing at Huff House and Boys Town is removed. Remove housing units (7 buildings, 64 beds) in rock fall hazard zone. Construct 16 buildings, housing 164 employees using the same dormitory prototype. Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Mitigation measures would avoid or mitigate effects to iconic scenic vistas. Actions would continue to protect the ORV locally.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Visitor Facilities	Remove of 102 lodging units (143 remain). Repurpose the area outside the 100-year floodplain for Day Lodge and Parking. Restore the 100-year floodplain.	Currently not interfering with scenic resources. Viewsheds would be enhanced through the removal of these buildings.

In consideration of Wild and Scenic River Act requirements that the NPS consider the presence of existing structures, major facilities and services provided for visitor use, the NPS would eliminate several structures and facilities in Segment 2 under this alternative. Under Alternative 3 actions would remove many structures at the Yosemite Lodge, and the Ahwahnee pool and tennis court. Removal of these structures could enhance scenic resources from specific locations. Ecological restoration actions in Segment 2 would

enhance the meadow and riparian communities which contribute to the scenic values in Yosemite Valley. This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Facilities that would remain in this segment of the river have no direct impact on the scenic river value as indicated in the baseline condition assessment. Changes to parking and vehicle traffic in Yosemite Valley to enhance Recreational ORV- 20 particularly the removal of roadside parking along Sentinel Drive and restoration to natural conditions would enhance Scenic ORV-16.

**Conclusion:** Under Alternative 3, the scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Tree thinning and ecological restoration actions would improve natural scenic conditions. Removal of buildings at Housekeeping Camp, Yosemite Lodge, the Concessioner Garage, the Concessioner General Offices, and the Concessioner Stables would reduce intrusions on scenic resources. All parking lot and campground construction under this alternative would be subject to park standard operating procedures and subject matter expert review to ensure that scenic resources are protected.

### ***Recreational ORV-20 – River-related Recreation in Yosemite Valley***

Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River. Throughout the Yosemite Valley segment, the river has provided the setting for recreational experiences such as fishing, floating, and sightseeing. Transportation is considered an important part of the visitor experience in Yosemite Valley because it is the means of access to recreational opportunities in Yosemite Valley. Management considerations address the amount of vehicle traffic and the number of people at one time in Yosemite Valley at the peak times of day during the park's busy summer season.

All restoration actions to protect and enhance biological, cultural, geologic/hydrologic, and scenic ORVs would further enhance visitors' connections to the river and its values, which are essential to the recreational ORV in this segment. A reduction in day-use, camping, and lodging opportunities would reduce access to these recreational experiences, but would not cause adverse effects or degradation to ORV-20 on a segmentwide basis. The removal of Yosemite Lodge and Housekeeping Camp would eliminate two distinct types of overnight accommodations in Yosemite Valley, but overnight lodging would not be eliminated segmentwide, nor would an essential aspect of the recreational ORV be affected. There are also actions proposed in Alternative 3 that would improve picnicking, and wayfinding. Finally, while commercial boating is eliminated and private boating is limited to 50 trips per day in Segment 2, this alternative reduces crowding and increases the stretches of the river on which private boating and paddling is allowed, thereby enhancing key aspects of this recreational experience.

**TABLE 8-84: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR RECREATIONAL ORV-20**

Location	Action in Alternative 3	Effects to ORV-20
Segmentwide visitation	13,200 visitors per day	This reduction in visitation would reduce crowding and congestion thereby enhancing the recreation ORV on a segmentwide level.
Concessioner Stables	Reduce the Curry Village Stables area; eliminate commercial day rides.	Changes would reduce opportunities for one type of recreational activity, but would not substantially alter components of the river recreation experience.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Changes to Lodge would reduce access to overnight accommodations. Lodge itself is not part of the ORV-20 but does facilitate access to ORV-20 for certain visitors. This use would remain.
Lower Rivers Nature Walk	Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	Change would improve interpretation of the river and its values, and would enhance the recreation ORV in this segment.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts	Removal of facilities would reduce opportunities for one type of recreation activities, but would not substantially alter components of the river recreation experience.
Segment wide River Access	Swimming and water play allowed in all segments except 6, impoundment. No commercial boating. Boating allowed on all segments except 6, impoundment. Private use limited to 50 trips per day in Segment 2 between the Pines Campgrounds and Sentinel Beach.	Change would eliminate commercial boating and would limit the number of private boating. However, this change does not affect components of the recreational ORV. This reduction in boats enhances dispersed recreation along the river corridor.
Housekeeping Camp Lodging	Remove all 266 lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	Removal of units would have local affect, but would not substantially alter components of the river recreation experience.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	Change would cause improve circulation and wayfinding thus enhancing ORV-20.
<b>Yosemite Lodge And Camp 4</b>		
Yosemite Lodge Visitor Facilities	Remove 102 lodging units (143 units remain). Repurpose the area outside the 100-year floodplain for Day Lodge and Parking. Restore the 100-year floodplain.	Removal of lodging would have local affect, but would not substantially alter components of the river recreation experience.
Yellow Pine, Camp 4, Yosemite Lodge, and West Valley Campgrounds.	Remove camping and restore the 100-year floodplain to natural conditions. Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4.	Reduction in the number of campsites limits access to these recreational experiences, but camping opportunities would continue and not substantially alter components of the river recreation experience.
Recreational Experience Quality	Reduction in available day-use parking, and implementation of an East Yosemite Valley Day-use Parking Permit system	This will enhance the recreational experience of segment 2 by reducing crowding at key attraction sites as well as access to these areas (along roadways, in parking lots, etc).

Chapter 6 provides a more detailed description of the day-visitor capacity management strategies that directly measure aspects of the Recreation ORV and outlines specific actions. These actions include:

- Utilize parking and traffic management staff to improve parking efficiency and traffic flow in Yosemite Valley and other locations where needed.
- Institute a transportation fee at entrance stations (for peak-use season).
- Divert vehicles to other destinations outside of Yosemite Valley when parking in the Valley fills.
- When all parking fills to capacity, day visitors would be diverted at checkpoints throughout the park and at entrance stations.
- East Valley day-use parking permits would be issued by advanced reservation and on a first-come-first-serve basis.

NPS would use the Highway Capacity Manual Pedestrian Level of Service (discussed further in Chapter 5) for evaluating the capacity and quality of service of transportation facilities, including walkways, multi-use paths, and similar pedestrian facilities. NPS would also monitor parking rates and vehicles at one time to ensure that they are not exceeding the management standard. Should specific trigger points be reached, the NPS would implement a series of specific actions to improve parking to an acceptable level. Similarly, should visitor densities begin to approach specific triggers; NPS would take steps to keep such densities within the management standard.

**Conclusion:** Under Alternative 3, the recreation ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season will significantly reduce crowding thereby enhancing the recreational ORV. All restoration actions would enhance opportunities to connect with the river and its values. The reduction in commercial services would affect opportunities for particular types of recreational activities, but would not affect the essential components of the recreation ORV on a segmentwide basis.

### Segment 3 – The Merced Gorge (Scenic Segment)

#### *Scenic ORV-17 – Scenic View in the Merced River Gorge*

The Merced River drops 2,000 feet over 14 miles; a continuous cascade under spectacular Sierra granite outcrops and domes. There are no existing management considerations with respect to the Scenic ORV in the Merced River Gorge. Although there are some localized visual intrusions from essential facilities such as visitor parking areas, restrooms, the Arch Rock entrance station and the El Portal Road, these facilities are consistent with the scenic classification of this river segment. As explained in Chapter 5, this ORV is currently protected and enhanced.

This alternative does not propose any new development or landscape changes within the river corridor aside from improvements to existing roadside pullouts and drainage. These changes would not degrade or adversely impact the scenic ORV on a segmentwide basis. Although private vehicles and overall visitation during peak periods will be managed for East Yosemite Valley only, it is probable that visitation and visitors

at one time in Segment 3 will also witness a reduction under this alternative. This reduction in visitation and visitors at one time may reduce vehicles per viewshed, thereby enhancing the scenic ORV. Monitoring associated with this ORV would ensure that the attributes that comprise this ORV remain within the accepted management class rating.

Alternative 3 would accommodate the same kinds and amounts of use that exist today in Segment 3. The types and levels of use in Segment 3 under this alternative would remain largely unchanged. Actions considered under Alternative 3 would cause no adverse effects or degradation to ORVs on a segmentwide basis.

**Conclusion.** Under Alternative 3, this scenic river segment would show little evidence of human activity and remain largely free of structures. The scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season in Yosemite Valley will significantly reduce the number of vehicles per viewshed in this segment. All restoration actions would further enhance scenic characteristics in this segment.

## **Segment 4 – El Portal (Recreational Segment)**

### ***Geological/Hydrological ORV-7 – The Boulder Bar in El Portal***

Natural processes would continue to shape the landscape and the geologic ORV. The NPS has not identified any management considerations with respect to the El Portal boulder bar. Land use and facility actions proposed in this alternative would not affect this ORV. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection are necessary. Moreover, the types and levels of visitor and administrative use (e.g., housing, maintenance operations, office space, passive recreation) allowed under this alternative would not affect this ORV. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

**Conclusion.** Under Alternative 3, the geologic values of this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no actions that would affect the boulder bar in El Portal, and there are no ongoing concerns or considerations associated with this resource.

### ***Cultural ORV-11 – The El Portal Archeological District***

The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region. Four sites are known to have experienced particularly severe damage, most notably a large ancient village and cemetery.

To address management considerations pertinent to this river value, the NPS would undertake the following actions:

- Protective measures would ensure that exceptional sites would be protected from unmitigated effects that could lead to adverse effects or degradation on a segmentwide level. A plan of action for addressing the abandoned infrastructure on sites would be developed in consultation with traditionally-associated American Indian tribes and groups. Any solution(s) developed would also include a recommended approach for deterring visitor use within the sites.
- Informal trails, non-essential roads, and abandoned infrastructure would be removed to protect and enhance the archeological resources contributing to the ORV in Segment 4.
- Remove informal trails and non-essential roads.

There are no existing instances of adverse effect or degradation to this ORV. As discussed above, management considerations are present associated with abandoned infrastructure that remains on an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians. Management considerations are also associated with non-essential roads and trails that impact archeological sites. In recognition of the high cultural significance of these sites, this alternative requires the park to develop plans to remove abandoned infrastructure and non-essential roads. Restoration actions to establish a 2.5 acre recruitment area for Valley Oaks would further protect adjacent archeological resources. Construction of employee housing in Old El Portal, Abbieville, and Rancheria would be designed to avoid or mitigate threats and disturbances to archeological sites. Monitoring and protective measures would ensure that new use patterns associated with the new housing would not affect contributing elements of the El Portal Archeological District.

**TABLE 8-85: SEGMENT 4 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-11**

Facility	Action in Alternative 3	Effects to ORV-11
<b>El Portal</b>		
Old El Portal, and Rancheria Flat Concessioner Employee Housing	New employee housing in Old El Portal (12 beds), and Rancheria Flat (19 beds).	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Abbieville Trailer Park Area	No new parking spaces added at the Abbieville/Trailer Park area.	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Mitigation measures would protect cultural resources during facility removal and ecological restoration. Change would continue to protect archeological resources locally.

**Conclusion:** Under Alternative 3, the archeological resources in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of abandoned infrastructure, informal trails and non-essential gravel roads would enhance protection of archeological resources. Valley Oak restoration actions would protect adjacent archeological resources from further ground disturbance, Construction of new employee housing would be designed to avoid or mitigate effects



to the El Portal Archeological District. New or altered visitor use patterns associated with the new housing development would be monitored and protective actions would occur if effects triggered responses.

## **Segment 5 – South Fork Merced River Above Wawona (Wild Segment)**

### ***Biological ORV-1 – High-elevation Meadows and Riparian Habitat***

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Restoration actions to remove informal trails and charcoal rings to protect cultural resources proposed under this alternative would not affect high-elevation meadows. The NPS proposes no major facility or visitor use actions for Segment 5 under Alternative 3. The biological ORV in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level.

### ***Cultural ORV-12 – Regionally rare archeological features representing indigenous settlement including archeological sites with rock ring features***

Three regionally rare prehistoric archeological sites are located along this segment of the South Fork of the Merced Wild and Scenic River corridor. The sites contain unique stacked rock ring constructions and rock alignments. Two sites also contain pine timber remains within the ring interiors or incorporated into the stacked rock courses. Rock constructions are considered fragile and highly subject to human alteration from camping and campfire building disturbances. Two of the South Fork sites are adjacent to formal NPS trails, increasing the likelihood of disturbance. The vicinity of the sites has not been systematically surveyed, and it is possible that additional rock ring sites may be present along the South Fork. Should additional rock ring sites be discovered in the monitoring process, they would also become a part of the South Fork ORV. To remedy these considerations, NPS would:

- Complete documentation of the features. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker). Remove informal trails and charcoal rings.
- Increase education and outreach to Wilderness travelers.

**Conclusion.** Under Alternative 3, the archeological resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no specific actions to manage user capacity, land use, and/or facilities under Alternative 3 within Segment 5 beyond those designed to protect and enhance ORV-12 that would impact components of Cultural ORV-12. Monitoring activities described in Chapters 5 and 8 would continue to protect and enhance Cultural ORV-12 to ensure there are no adverse effects or degradation to ORV-12 on a segmentwide basis.

### ***Scenic ORV 18 – Scenic Wilderness Views along the South Fork Merced River***

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no

considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

**Conclusion.** Under Alternative 3, the scenic resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. The scenic ORV for Segment 5 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## Segment 7 – Wawona (Recreational Segment)

### *Biological ORV-3 – The Sierra sweet bay (Myrica hartwegii)*

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV would be determined by comparing populations located near Wawona Campground (an area that is likely to be disturbed by humans) with more remote populations that are less likely to receive such disturbance. This population of Sierra sweet bay is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

**TABLE 8-86: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR BIOLOGICAL ORV-3**

Facility	Action in Alternative 3	Effects to ORV-3
<b>Wawona</b>		
Wawona Campground	Retains 72 sites. Remove 27 sites that are either within the 100-year floodplain or in culturally sensitive areas.	Action would improve the condition of the ORV by reducing the potential effects on this species associated with campground visitation.

To ensure that this biological ORV is protected and enhanced through time, the NPS would monitor the condition of the Sierra sweet bay population to ensure early warning of conditions that require management action before impacts occur.

**Conclusion.** Under Alternative 3, the Sierra Sweet Bay in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Reduction in camping and visitor activity in the vicinity of Wawona Campground would enhance this resource.

### *Cultural ORV-13 – Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This district spans segments 5, 6, 7, and 8. Accordingly, the condition of this historic property is assessed at the property-level, rather than the segmentwide level. Segment 7 includes the remains of the U.S. Army Cavalry Camp A. E. Wood documenting the unique Yosemite legacy of the African-American buffalo soldiers and the strategic placement of their camp near the Merced River. There are several management considerations for this ORV: the Wawona Archeological District is subject to site-specific impacts from park operations, visitor

use, artifact collection, vandalism, and ecological processes. The following actions would help to address these issues:

- Increase monitoring frequency at affected sites.
- At the district-wide level, revise the existing National Register nomination to reflect changes since its original writing, for example, incorporating newly discovered resources and documenting impacts.
- The Wawona Campground capacity would be reduced to 67 sites (including one group site). 32 sites are removed because they are either within the 100-year floodplain or in culturally sensitive areas.
- Remove informal trails and fire rings to prevent continuing disturbance.
- Develop site management plans as needed for sites with complex uses. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds
- Consider need for archeological site treatment measures to address impacts to shallow deposits of artifacts and features.

**TABLE 8-87: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-13**

Facility and Land Use	Action in Alternative 3	Effects to ORV-13
<b>Wawona</b>		
Wawona Campground Septic System	Remove septic system, and connect to the sewer system. Build a lift station above the campground to connect to the existing water treatment plant.	Mitigation measures would protect cultural resources during facility construction.
Wawona RV dump site	Relocate the dump site to an appropriate location away from the river.	Mitigation measures would protect cultural resources during facility removal and construction.
Wawona Store	Replace the existing public restroom facilities with larger restrooms to accommodate visitor use levels. Improve picnic area, redesign bus stop.	Mitigation measures would protect cultural resources during facility construction.
Wawona Swinging Bridge	Provide access to Swinging Bridge with access on the south side of the river, delineate trail, restrooms, waste disposal and parking.	Mitigation measures would protect cultural resources during facility construction. Restrooms and waste disposal will reduce threats and disturbances to adjacent archeological resources.

The NPS would delineate trails, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; conduct public education to discourage disturbance to sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

### ***Cultural ORV-14 – Wawona Historic Resources***

The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the

United States with this high level of integrity. The Wawona Covered Bridge is in good condition, and there are no current management considerations associated with it, however the bridge requires maintenance to keep the historic structure in good condition in the face of adverse weather and visitor use.

The Wawona Hotel complex continues to serve its original purpose as a guest lodging facility. Management considerations related to the hotel complex involve concessioner operations, the need for regular and routine preservation maintenance, and periodic rehabilitation to ensure visitor safety.

- Regular and routine preservation maintenance, conducted in accordance with the Secretary of the Interior’s Standards, would ensure that this upkeep protects the historic character of the buildings
- Periodic rehabilitation would involve subject-matter specialists in planning, design and implementation to ensure actions do not compromise the historical integrity of the complex
- Concessioner operations would ensure that any operational modifications or updates are appropriate and in keeping with the historic character of the complex.

**TABLE 8-88: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR WAWONA HISTORIC RESOURCES ORV-14**

Facility	Action in Alternative 3	Effects to ORV-14
<b>Wawona</b>		
Wawona Hotel	Retain 104 lodging units at the Wawona Hotel. Retain hotel restaurant and swimming pool. Wawona golf course and shop would be removed to accommodate ecological restoration, though the spray field would remain. The Wawona Hotel Tennis Court would also be removed under this alternative.	The action would retain contributors to the Wawona Historic Resource. The golf course and tennis courts are not components of the ORV and their removal would not affect the condition of the Wawona Historic Resource river value. The ORV would continue to be protected locally.

To prevent future impacts, the NPS would monitor the condition of the bridge, and take specific actions should conditions exceed trigger points. Trigger points are selected to inform managers well in advance of adverse effects or degradation on the Wawona Covered Bridge. Management considerations for the Wawona Hotel complex include the need for regular and routine preservation maintenance, periodic rehabilitation, and ongoing operations that serve its continuing function as a historic lodging facility. To address these management considerations, the NPS would ensure that these activities would conform to the Secretary of the Interior’s Standards for Treatment of Historic Properties.

## Segment 8 – South Fork Merced River below Wawona (Wild Segment)

### *Biological ORV-3 — The Sierra sweet bay (Myrica hartwegii)*

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV in Segment 8 is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

### ***Cultural ORV 13— Wawona Archeological District***

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This ORV in Segment 8 is in good condition, with no management considerations present. Management actions are not required at this time.

### ***Scenic ORV-18 – Scenic Wilderness Views along the South Fork Merced River***

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

The scenic ORV for Segment 8 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## **ALTERNATIVE 4**

### **River Value – Free-flowing Condition in All Segments**

A free-flowing river, or section of a river, moves in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis. Riprap revetment, abandoned infrastructure within the bed and banks of the river, and bridges that constrict the flow of the river may produce localized effects on free-flowing condition of the river. Alternatives 2-6 would enact a comprehensive suite of actions to enhance the free-flowing condition of the river by removing 3,400 linear feet of riprap, and removing abandoned and unnecessary infrastructure from the river channel and its floodplain. Infrastructure that would be removed includes former sewage treatment facilities, sewer and water lines, and former bridge abutments. In addition, Alternative 4 would remove 435 linear feet of riprap from riverbank areas, beyond that proposed for removal under Alternatives 2-6.

Alternative 4 also proposes removal the Stoneman and Ahwahnee bridges, as these features constrict flows during high-water events, accelerate riverbank and channel erosion, and prevent natural channel migration. Although Sugar Pine Bridge would remain under Alternative 4, the hydrological effects of the bridge would be mitigated with strategic placement of large wood on riverbanks, constructed log jams in the river channel, and the use of brush layering and other techniques to establish riverside vegetation and decrease erosion.

There are no new facilities proposed under Alternative 4 that would affect the free-flowing condition of the river. A number of proposed facility actions would enhance the connectivity of the river and its floodplain

(see Hydrological/Geological ORVs). For example, the Yosemite Village Day-use Parking Area would be relocated 150 feet away from the river.

To protect the river's free flowing condition in the future, the NPS would require all proposed projects involving construction within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSR. Through this process, the NPS would ensure that water resources projects within the designated river corridor would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition.

**Conclusion:** The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis, although localized considerations such as intermittent riprap and bridges that constrict the flow of the river are present. Alternative 4 proposes a comprehensive suite of actions to enhance the free-flowing condition of the river by removing riprap, removing unnecessary infrastructure in the river channel, and removing two bridges that produce pronounced hydraulic constrictions at high water flows. There are no new facilities proposed under Alternative 4 that would affect the free-flowing condition of the river within the river channel, and a number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/ Geological ORVs). The NPS would require all proposed projects within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSR to ensure that water resources projects would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition. The actions proposed under Alternative 4 ensure that there are no direct or adverse effects on free-flowing condition of the Merced River.

## **River Value – Water Quality in All Segments**

The water quality of the Merced River is extremely high, and the current water quality of the river is fully protected and enhanced on a segmentwide basis. Intermittent local instances of contamination may occur in connection with surface water runoff from parking areas, recreational vehicle dump stations in proximity to the river, and accelerated erosion with potential sediment loading in the river during high water flows. Alternatives 2-6 would apply mitigation measures to ensure that surface water runoff associated with parking areas protects the water quality of the Merced River and meets regulations. The Upper Pines and Wawona recreational vehicle dump stations would be moved away from the river, and the Odger's bulk fuel storage area in El Portal would be moved out of the 100-year floodplain. In addition, Alternative 4 would relocate the Yosemite Village Day-use Parking Area 150-feet away from the river. All campsites and infrastructure currently within 100-feet of the river would be removed. The pack trail from Curry Village stables to Happy Isles would be re-routed farther away from the river. These actions would reduce result in less erosion along the riverbank, reduce use in sensitive areas, direct use to resilient areas, and mitigate potential sources of pollutants.



**TABLE 8-89: CORRIDOR-WIDE ACTIONS AND THEIR IMPLICATIONS FOR WATER QUALITY**

Location	Action in Alternative 4	Effects to Water Quality
<b>Segment 2</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	Campsites within the 100-year floodplain would be removed. Designated river access and put in areas established at resilient areas, discourage access to sensitive areas. Upper Pines dump station relocated away from the river.	These changes would result in less erosion along the riverbank; water quality would be enhanced segmentwide.
New campsites at Upper Pines, Backpacker's, Concessioner Stables, Camp 4, West of Lodge, and Upper and Lower River Campgrounds	New campsites constructed at Upper Pines, Upper River, Lower River, Backpackers, Concessioner Stables, West of Lodge and Camp 4 out of the 150 foot riparian buffer.	Change would not result in additional water quality effects on a segmentwide level.
Yosemite Village Day-Use Parking Area	Move the unimproved parking lot out of the 10-year floodplain and restore the riparian habitat adjacent to the river.	Change would result in less erosion and storm water run-off from the parking area; water quality would be enhanced locally.
Pack Trail from Concessioner Stables to Happy Isles	Remove pack trail and Concessioner Stables and convert to a campground with 41 sites.	Change would result in less erosion from the stock trail. Water quality would be enhanced locally.
Housekeeping Camp Lodging	Retain 100 lodging units, and remove 166 lodging units (83 duplex lodging units, 4 restrooms, store and office) out of the observed ordinary high water mark.	Fencing and designated river access points would also direct use to resilient areas. Water quality would be enhanced locally.
<b>Segment 4</b>		
NPS Maintenance and Administrative Complex	Existing parking area formalized and paved using best management practices	Change would result in less erosion and storm water concerns in the parking area; water quality would be enhanced locally.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Removal of bulk fuel storage from the 500-year floodplain would further protect water quality segmentwide.
<b>Segment 7</b>		
Wawona Campground	Replace current septic system with waste water collection system connected to the waste water treatment plant. RV dump site relocated away from the river.	Change would result in less potential for storm water concerns in the campground; water quality would be enhanced locally.
Wawona Picnicking	Delineate boundaries of two formal picnic areas with formal river access points.	Change would result in less erosion along; water quality would be enhanced locally.

Ecological restoration actions would take place along the riverbank and floodplain of the Merced River. These actions would enhance water quality, particularly the actions that re-establish riverbank vegetation and reduce erosion potential. Ecological restoration actions are described in more detail in the discussion of the biological ORVs below and in Appendix E.

There are no new facilities proposed under Alternative 4 that would threaten the water quality of the river. In areas of new development or high-density use, sensitive riverbanks would be fenced to eliminate trampling. Trampling can lead to vegetation loss and exposed soil, leading to accelerated sediment

deposition in the river. To maintain excellent water quality, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

**Conclusion:** Under Alternative 4, water quality in all segments of the Merced River corridor within Yosemite Valley would continue to be absent of adverse effects and degradation, and the potential for localized instances of contamination would be strongly reduced. Alternative 4 would address localized issues by moving the Upper Pines and Wawona recreational vehicle dump stations away from the river, moving the Odger's bulk fuel storage area outside of the 500-yr floodplain, and applying mitigation measures to ensure surface water runoff associated with parking areas meets requirements. Ecological restoration actions would decrease the potential for accelerated riverbank erosion and sediment loading during high water events. To ensure that existing high water quality conditions are maintained, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

## **Segment 1 – Merced River Above Nevada Fall (Wild Segment)**

### ***Biological ORV-1 – High-elevation Meadows and Riparian Habitat***

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Primary actions to protect and improve Biological ORV 1 include removal of informal trails that incise meadow habitat, trails in wet and/or sensitive vegetation, and trails that fragment meadow habitat, including trails in the Triple Peak Fork meadow, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and other areas as necessary. Removal of social trails that bisect the meadows would improve conditions in this segment because soil compactions and habitat fragmentation would be reduced. Preliminary grazing capacities would be established, monitored, and adapted as necessary which would also reduce soil compaction and habitat fragmentation, thus further enhancing meadow health.

Facilities that would remain in this segment of the river include designated camping areas in Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Area (including associated trails and footbridges). As described in Chapter 5, these facilities are not adversely impacting the Biological ORV. This alternative would remove all facilities at the High Sierra Camp and the area would be ecologically restored. Seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones would be applied as indicated. These changes would reduce use levels near the riverbank and result in improvement to riparian conditions in the immediate vicinity of these camping areas.

As described in Chapter 5, to ensure this ORV is protected and enhanced through time, the NPS would monitor three indicators to assess the condition of the ORV: meadow bare soil, meadow fragmentation due to the proliferation of informal trails, and streambank stability. The NPS would establish a baseline for all three indicators using site-specific monitoring protocols by 2013. Regular monitoring would also reveal whether assumptions about human behaviors and actions taken to correct past actions are sustaining conditions above the management standard. If conditions have reached trigger points; the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects. The

meadow monitoring programs for the biological ORV would monitor meadow fragmentation to ensure that use levels from hikers, backpackers and stock users do not result in meadow fragmentation or bare ground in excess of the management standards prescribed to protect and enhance meadows.

**TABLE 8-90: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-1**

Location	Action in Alternative 4	Effects to ORV-1
Meadow trails	Remove informal trails that incise meadow habitat.	Change reduces effects to wet and sensitive meadows and results in localized enhancement to ORV-1.
Merced Lake High Sierra Camp	Remove all facilities at the High Sierra Camp and ecologically restore the area.	Changes reduce uses near riverbank which would enhance riparian conditions through reduction in erosion and trampling.
Private boating would be allowed in this segment	Boating would consist of short floats using pack raft or other craft that can easily be carried. Put-ins and take-outs would be undesignated and dispersed. Only five boats per day allowed - permit would be required.	Limited numbers would protect riparian habitat from trampling and bank erosion that could result with unlimited access.
Wilderness zone capacity	Zone capacities for Merced Lake, Washburn Lake, Mount Lyell, and Clark Range zones would remain the same across all the alternatives. Manage to a reduced capacity of 100 in the Little Yosemite Valley Wilderness Zone	Zone capacities are designed to protect wilderness character including natural conditions such as riverbanks and meadows. Reduced capacity in LYV would result in localized enhancement of riparian habitat.

**Conclusion:** Under Alternative 4, the biological ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance riverbanks and meadows. Removal of social trails, changes to grazing in Merced Lake East Meadow, and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures. Facilities that would remain in this segment of the river include Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the Biological ORV in this segment indicates that these facilities are not adversely affecting the Biological ORV.

### ***Geological/Hydrological ORV-4 – Glacially-carved Canyon in the Upper Merced River Canyon***

As discussed in Chapter 5, there are no management considerations with respect to the U-shaped, glacially carved canyon above Nevada Fall. This ORV is currently protected and enhanced within the meaning of the Wild and Scenic Rivers Act. Alternative 4 does not propose any actions that would change the condition of this ORV over time. Further, the U-shaped, glacially carved attributes of this ORV would not be affected by the types and levels of use authorized under this alternative, which are all directed toward wilderness oriented recreation. The NPS would nevertheless monitor the condition of this ORV to ensure that its condition does not decline.

### ***Scenic ORV-15 – Scenic Views in Wilderness***

Visitors to this Wilderness segment experience scenic views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks. Management considerations associated with the condition of the scenic river above Nevada Fall include contributions of regional air pollution (primary factors contributing to this condition are outside of NPS jurisdiction), visual intrusions of temporary and permanent structures, and crowding in and near wilderness campgrounds. There are few “visual intrusions” noted beyond the High Sierra Camp and other designated camping areas. However, these effects are local in nature and do not degrade the ORV on a segment wide basis. The NPS would ensure that designated camping areas are maintained in a clean and tidy condition. Under Alternative 4, the High Sierra Camp would be removed and replaced with dispersed camping. This change would return scenic views to be keeping with the native landscape. These measures would locally enhance the scenic ORV. Other visitor use management actions under Alternative 4 would reduce crowding, thus additionally enhancing this ORV on a segmentwide basis.

The ORV is determined to be in the protected state, as defined by an absence of adverse effects and degradation, although intermittent air quality concerns are present. Because of the ambient nature of air quality, it cannot be managed exclusively for the river corridor. Facilities that would remain in this segment of the river include the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the scenic ORV in this segment indicates that these facilities are not adversely affecting the scenic ORV.

**TABLE 8-91: SEGMENT 1 ACTIONS AND IMPLICATION FOR SCENIC ORV-15**

Location	Action in Alternative 4	Effects to ORV-15
Merced Lake High Sierra Camp	Remove all facilities at the High Sierra Camp and ecologically restore the area.	Change would enhance ORV because the removed infrastructure would allow for restoration to the natural environment.
Little Yosemite Valley Backpackers Camping Area	Decrease the designated camping area and retain composting toilet.	Reduction in designated camping area would enhance scenic values locally in this segment.
Facilities retained	Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp	These facilities and associated administrative uses and maintenance do not result in segmentwide adverse effects to scenic values. The ORV will continue to be protected on a segmentwide level.

**Conclusion.** Under Alternative 4, the scenic ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance scenic values in this segment. Removal of the Merced Lake High Sierra Camp, conversion of the designated camping areas to dispersed camping, and ecological restoration of meadows and riparian areas would improve scenic conditions in this segment and thereby enhance the scenic ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures.

### ***Recreational ORV-19 – Wilderness Recreation above Nevada Fall***

Visitors to federally designated Wilderness in Segment 1 would engage in a variety of river related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-

reliance, and solitude shape the Wilderness experience. The current condition of this ORV is at or above the management standard at the segment level. Localized management concerns in this segment relate to crowding at Little Yosemite Valley and Moraine Dome backpackers campgrounds, high use levels at the Merced Lake Backpackers Camping Area, and high encounter rates along the trails that connect these areas. Crowding and high use levels affect the Wilderness experience, which is an integral part of the recreational ORV in this segment.

This alternative would remove all facilities at the High Sierra Camp and ecologically restore the area. The capacity of the Little Yosemite Valley Wilderness Zone would be reduced to 100, and the footprint of the camping area would be reduced accordingly. Actions in Alternative 4 would apply additional seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones. These changes would reduce use crowding, high use levels, and increase opportunities for solitude in this Wilderness segment.

Facilities that would remain in this segment of the river include the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. These facilities do not have an adverse effect on the Wilderness experience integral to this Recreational ORV.

**TABLE 8-92: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR RECREATION ORV-19**

Location	Action in Alternative 4	Effects to ORV-19
Merced Lake High Sierra Camp	Remove all facilities at the High Sierra Camp and ecologically restore the area.	The undeveloped and primitive elements of wilderness character are enhanced on a segmentwide level.
Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Areas	Retain as designated camping. Replace flush toilets with composting toilet at the Merced Lake Backpackers Camping Area.	The solitude and primitive elements of wilderness character would be enhanced locally at Little Yosemite Valley and Merced Lake Backpacker's designated camping areas due to the reduction in crowding and opportunity to camp out of sight and sound of other campers.
Segmentwide River Access	Swimming and water play allowed. Permits required for private boating. Commercial boating by commercial use authorization.	Permitted use and commercial limits would not substantively change current recreational use or recreational values in the segment. Recreational values would continue to be protected.
<b>Visitor Use Management Action</b>		
Private boating would be allowed in this segment	Boating would consist of short floats using pack raft or other craft that can easily be carried. Put-ins and take-outs would be undesignated and dispersed. Private use limited to 10 boats per day with backcountry permit on Segment 1. Permit would be required.	Permitted use would not substantively change current recreational use or recreational values in the segment. Recreational values would continue to be protected.
Wilderness zone capacity	Zone capacities for Merced Lake, Washburn Lake, Mount Lyell, and Clark Range zones would remain the same across all the alternatives. Manage to a reduced capacity of 100 in the Little Yosemite Valley Wilderness Zone	Zone capacities are designed to protect recreational setting attributes and recreational experience quality. Reduced capacity in LYV would result in localized enhancement of recreational values in Wilderness.

NPS would monitor visitor encounter rates to ensure that they are not exceeding established standards. Should specific trigger points be reached, the NPS would be required to implement a series of specific actions to reduce visitor levels to an acceptable level. These actions increase in severity as the current condition ORV condition moves away from the management standard to ensure proper course correction and re-establishment of the management standard. These trigger points were selected to inform managers in advance of any adverse effects or degradation to this ORV.

**Conclusion:** Under Alternative 4, the recreational ORV in Segment 1 of the Merced River corridor would be protected on a segmentwide basis and continue to be absent of adverse effects and degradation on a segmentwide level. Reductions in the zone capacity for Little Yosemite Valley, and removal of the Merced Lake High Sierra Camp would address management considerations by reducing crowding, high use levels, and increasing opportunities for solitude.

## Segment 2 – Yosemite Valley (Recreational and Scenic Segments)

### *Biological ORV-2 – Mid-elevation Meadows and Riparian Habitat*

The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada. Actions to protect and enhance Biological ORV-2 under Alternative 4 include:

- Removal of informal trails in meadows where they fragment meadow habitat or cross through sensitive, wet vegetation communities. Overall, restore six miles of informal trails throughout Yosemite Valley;
- Use boardwalks or hardened surfaces to allow access to sensitive areas;
- Delineation of trails through upland areas and along meadow perimeters;
- De-compacting trampled soils and consolidate multiple parallel trails;
- Re-directing visitor use to more stable and resilient river access points such as sandbars, and designate formal river access sites. Establishing fencing and signage to protect sensitive areas; install boardwalks where appropriate, and actively revegetate where needed;
- Relocate or remove all campsites within the 100-year floodplain and restore natural floodplain and riparian habitat;
- Restoration of the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest at specific locations in Yosemite Valley. Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure re-design. Alternative 4 would include 223 acres ecological restoration.
- Installation of constructed log jams in the river channel between Clark’s Bridge and Sentinel Bridge to remediate river widening and improve channel complexity would also contribute to improving riparian health.
- Day use parking capacity is expanded and formalized. A total of 2,045 visitor parking spaces would be provided in the Valley accommodating a maximum of 6,497 people at one time to Segment 2. Managing access and other proactive restoration measures would protect Biological ORVs by during periods of high use.



- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Biological ORVs by removing these uses from the river corridor and managing access in the corridor.

This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Under this alternative, all roads, buildings, campgrounds, trails, utilities and infrastructure, and other facilities in this segment with current local effects on the biological ORV would be removed, reduced, or relocated, including portions of Yosemite Lodge. Facilities that would remain in this segment of the river, including the Ahwahnee Hotel have no direct impact on the biological river value as indicated in the baseline condition assessment. Effects to the free-flowing condition of the river as a result of the bridges that would remain under this alternative would be mitigated through constructed log jams.

**TABLE 8-93: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2**

Location	Action in Alternative 4	Effects toORV-2
Segmentwide Restoration	(Common to all) Restoration includes restoration of meadow habitat, removal of informal trails, riparian restoration and establishment of designated river access points, and use of boardwalks and hardened surfaces.	Actions would enhance the biological ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within 150 feet of the river would be removed. Designated raft put-in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged; the biological ORV would be enhanced segmentwide
Stoneman Meadow and Curry Orchard parking lot	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and realignment of road through Boys Town area. The Orchard Parking Lot would be re-designed. Remove apple trees and landscape with native vegetation. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	These restoration actions would promote water flow and improve meadow health thereby enhancing the biological ORV locally.
New campsites at Upper Pines, Backpacker's, Concessioner Stables, Camp 4, West of Lodge, Boystown, and Upper and Lower River Campgrounds	New campsites constructed at Upper Pines, Upper River, Lower River, Backpackers, Camp 4, West of Lodge, Boystown, and Concessioner Stables out of the 150 foot riparian buffer.  Lower River: Designate river access at Housekeeping Camp eastern beach.	Actions would protect riparian areas from direct impacts related to the increase in visitor activity in these areas. Fencing and designated river access points would also direct use to resilient areas. Monitoring would proactively assess the effectiveness of these actions and established triggers to ensure that future protective measures are implemented in a timely manner. Change would result in protection of biological ORV in this segment.
Ahwahnee and Sugar Pine Bridges	Remove the Ahwahnee and Sugar Pine Bridges, and the associated berm and restore to natural conditions. Reroute the multiple use trail to the north bank of the river. Reroute utilities under Ahwahnee Bridge.	Change would reduce channel widening, erosion, and scouring thereby enhancing local riparian communities.

<b>Yosemite Village and Housekeeping Camp</b>		
Housekeeping Camp Lodging	Retain 100 lodging units, and remove 166 lodging units (83 duplex lodging units, 4 restrooms, store and office) out of the observed ordinary high water mark.	These changes would reduce effects to riparian corridor and enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Drive and restore to natural conditions.	These changes would remove uses from the riverbank thus reducing erosion and trampling impacts in riparian corridor and enhancing ORV components.
Ahwahnee Row and Tacoma Dorms Concessioner Housing	Housing and development between Village Store and Ahwahnee Meadow remain. Create a buffer zone for Indian Creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing.	Changes would result in reduction of residential activities in riparian areas; biological ORV would be enhanced locally.
<b>Yosemite Lodge and Camp 4</b>		
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Relocation of this facility outside of the river corridor may reduce informal trailing in the adjacent meadow thereby enhancing the ORV locally.
Northside Drive (Stoneman Bridge to Yosemite Village Day Use Parking Area	Facility retained. A component of the primary transportation & circulation road system that connects all major visitor service nodes. Hydrologic connectivity improved by increasing culverts.	Has a localized affect on the ORV as road bisects meadow but is consistent with recreational designation and not causing adverse effects or degradation to ORV-2 on a segmentwide basis.

The NPS would monitor three indicators to assess the condition of ORV 2: meadow fragmentation resulting from informal trails, the status of riparian habitat, and riparian bird abundance. As described in Chapter 5, adverse effects and degradation are not present in relation to the meadow fragmentation indicator.

Management concerns in meadows are present; however, actions to address informal trailing impacts and fragmentation would be taken at all meadows where these concerns have been documented. Initial surveys of the riparian status indicator in 2010 indicate that degradation is not present, but management concerns are also present in the riparian corridor.

The NPS is beginning to monitor the third indicator in this segment, riparian bird abundance. The first status assessments would take place in 2013, after one year of monitoring. The next assessment requires information from two out of three years.

To ensure Biological ORV-2 is protected by this plan and protected and enhanced through time, the NPS would continue to monitor the condition of the ORV to provide early warning of conditions that require management action before impacts occur. Regular monitoring would also reveal whether conditions have reached trigger points; and, if so, the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects.

**Conclusion:** Under Alternative 4, the biological ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance riverbanks and meadows. Removal or relocation of select campsites and infrastructure and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by

road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### ***Geological/Hydrological ORV-5 – The “Giant Staircase”***

The NPS has no immediate management considerations with respect to the Giant Staircase characteristic of the geology of Yosemite Valley above Happy Isles as this geologic ORV is determined to be absent of adverse effects and degradation. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### ***Geological/Hydrological ORV-6- Rare, Mid-elevation Alluvial River***

As described in Chapter 5, the NPS selected the status of riparian habitat as the indicator to specifically assess the effectiveness of actions designed to protect this and other ORV. This ORV integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities.

The following actions are included to specifically protect and enhance Free-flowing Conditions and Biological ORV-2, but would also address the protection and enhancement of ORV - 6.

- Large wood, constructed log jams, and brush layering would be used in the vicinity of bridges to decrease bed scouring and streambank instability. Riprap would be removed where possible and replaced with native riparian vegetation, using bioengineering techniques. In the event that such actions do not improve conditions, bridge redesign or removal could be reconsidered.
- Under Alternative 4 the free-flowing condition of the river would be enhanced by removing the Ahwahnee and Stoneman Bridges. Mitigation measures would be employed during removal and the long-term recovery of the removal area is expected. Restoring free-flowing conditions would enhance riparian communities associated with ORV-6.
- Removing abandoned underground infrastructure, along the river corridor would be part of a comprehensive strategy to correct altered surface and subsurface hydrology.
- Remove riprap where riverbanks do not need stabilization to allow for channel migration. Replace riprap with bioengineered riverbanks, integrating native riparian vegetation, where riverbank stabilization is necessary for protection of critical infrastructure.

To ensure this ORV is protected and enhanced through time, the NPS would monitor the condition of the ORV using the status of riparian habitat as an indicator, and take specific actions should conditions reach trigger points.

**Conclusion.** Under Alternative 4, the geologic/hydrologic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would enhance the 10 and/or 100-year floodplains and this ORV. Actions to protect and enhance free-flowing conditions as well as meadows and riparian complexes in Segment 2 would result in additional enhancement of the geologic/hydrologic ORV. The recreational segment of the Merced River corridor in

East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

**TABLE 8-94: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR GEOLOGICAL/HYDROLOGICAL ORV-6**

Location	Action in Alternative 4	Effects to ORV-6
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within 150 feet of the river would be removed. Designated raft put-in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged; the biological ORV would be enhanced segmentwide
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Lodging is outside the 100 year floodplain and is not causing adverse effects or degradation to ORV-6 on a segmentwide basis.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center Parking Area	Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 550 parking places.	These changes would reduce effects to riparian corridor and locally enhance ORV components as use would be relocated away from areas critical to hydrologic function.
Ahwahnee Row and Tecoya Dorms Concessioner Employee Housing	Remove housing and development out of the 100-year floodplain, recontour topography, decompact soils, and restore stream hydrologic function.	Changes would result in reduction of residential activities in riparian areas; biological ORV would be enhanced locally.
Housekeeping Camp Lodging	Remove 166 lodging units.	These changes would reduce effects to riparian corridor and enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	West of Yosemite Lodge re-developed to provide additional 550 day use parking spaces.	Implementation of mitigation measures would protect the floodplain from erosion and other disturbance during construction.
Yosemite Lodge Visitor Facilities	No changes in this facility.	Lodging is outside the 100-year floodplain and is not causing adverse effects
El Capitan Crossover	Facility retained. This roadway segment is a key connector between Northside and Southside Drives and serves as a exit point at west end of Yosemite Valley.	Bridge protects riparian habitat from destruction caused by random crossings throughout the river corridor
Northside Drive (Stoneman Bridge to Yosemite Village Day Use Parking Area)	Remove portion of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Removes facility that currently has a localized affect on the ORV. Restoration enhances the ORV in this area.

### ***Cultural ORV-8 – Yosemite Valley American Indian Ethnographic Resources***

As described in Chapter 5, Yosemite Valley American Indian ethnographic resources include relatively contiguous and interrelated places that are inextricably and traditionally linked to the history, cultural identity, beliefs, and behaviors of contemporary and traditionally-associated American Indian tribes and groups. Management considerations related to ethnographic resources involve park operations, crowding, and visitor use. Actions included in the Merced River Plan/DEIS include:

- Continue coordination between traditionally associated American Indian tribes, groups, and traditional practitioners (through the Park American Indian Liaison) with law enforcement, fire management, interpretation, invasive species, ecological restoration, and facilities management programs;
- Continue to provide operational guidelines for material staging areas, parking, etc. to protect ethnographic resources;
- Ensure access for traditionally-associated American Indians for participation in annually scheduled traditional cultural events. In addition, tribal access for the personal conduct of ongoing traditional cultural practices would be assured through the Yosemite tribal fee waiver pass program.
- Reduce and formalize day-use parking capacity Manage access in Segment 2 to protect traditionally-used plant populations in the river corridor during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Cultural ORVs by removing these uses from the proximity of several cultural resources.

Threats to traditionally-used plant populations include invasive species such as Himalayan Blackberry (*Rubus armeniacus*), drainage and hydrology impacts to meadows, and erosion and revetments that affect riparian vegetation. The *Merced River Plan/DEIS* would address these considerations through the following actions:

- The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program would address impacts to some traditionally-used plant populations in some locations.
- Restoration actions to protect riparian areas, meadows, and hydrological resources would further contribute to the protection and enhancement of the traditional-use plant communities included in this ORV.
- Introduction of seedlings to affected stands of black oaks and protection as necessary to ensure that ratios of adults to saplings is at least 0.65.
- Primary actions to manage major vista points under Scenic ORV-16 include mechanical thinning or removal of conifer trees. This action would be coordinated to ensure that the ORV-8 trigger point for the ratio of sapling to adult trees is not exceeded.

Facilities that would remain in this segment of the river have no direct impact on the ethnographic component of the cultural ORV as indicated in the baseline condition assessment.

**TABLE 8-95: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR CULTURAL ORV-8**

Location	Action in Alternative 4	Effects to ORV-8
Visitation	17,000 people per day	This reduced level of visitation may improve privacy for traditional cultural practices in specific locations seasonally. Access to annually-scheduled traditional cultural events and personal conduct of traditional cultural practices would be assured thereby continuing protection of the ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
Traditional Cultural Property Documentation	Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.	Documentation, mapping, and evaluation would provide the detail necessary to protect and enhance the ORV segmentwide.
Upper Pines, Backpacker's, Concessioner Stables, Boystown, Camp 4, and Upper and Lower River Campgrounds	All campsites within 150 feet of the river would be removed. New campsites constructed at Upper Pines, Backpacker's, Concessioner Stables, Boystown, Camp 4, and Upper and Lower River Campgrounds. Designated put in areas established for boating.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Lodging is outside the 100 year floodplain and is not causing adverse effects or degradation to ORV-6 on a segmentwide basis.
<b>Yosemite Village and Housekeeping Camp</b>		
Housekeeping Camp Lodging	Retain 100 lodging units, and remove 166 lodging units (83 duplex lodging units, 4 restrooms, store and office) out of the observed ordinary high water mark.	These changes would reduce effects to riparian corridor and locally enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Implementation of best management practices would protect the floodplain from erosion and other disturbance.
Yosemite Lodge Parking	25 additional spaces added at Yosemite Lodge due to redesign, improving parking efficiency near Northside Drive.	Implementation of best management practices would protect the floodplain from erosion and other disturbance.
Yosemite Lodge Visitor Facilities	Retain the existing 245 units.	Lodging is outside the 100 year floodplain and is not affecting the geologic and hydrologic processes.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Lodging is outside the 100 year floodplain and is not affecting the geologic and hydrologic processes.
Former Bridalveil Sewer Plant	Remove the buried structure.	Removal of the abandoned infrastructure and native plant revegetation will allow for recruitment of desirable black oaks in this area.
Yellow Pine Administrative Campground	Retain 4 group administrative use sites (up to 120 people).	Campground is within floodplain but would undergo restoration and is not impacting areas critical to river function.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Relocation of this facility outside of the river corridor may reduce informal trailing in the river corridor. Restoration will allow for recruitment of desirable black oaks in this area. The ORV would be enhanced locally.



The Merced *River Plan/DEIS* proposes a variety of actions to address specific considerations including continued coordination between traditionally associated American Indian tribes, groups, and traditional practitioners and the NPS; continued access for traditionally associated American Indians for participation in annually scheduled traditional cultural events; and ecological restoration actions to protect and enhance traditionally used plant populations. To prevent future impacts, the NPS would monitor the condition of the ORV, and take specific actions should additional trigger points be exceeded.

**Conclusion.** Under Alternative 4, the ethnographic component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Actions to protect and enhance floodplains, meadows and riparian complexes in Segment 2 would result in additional enhancement of the traditionally-used plant resources of the ethnographic component of the cultural ORV. Actions that would remove infrastructure and restore black oak woodlands would also enhance a critical component of this ORV. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would not limit access to traditional practitioners because measures would be in place to ensure access to annually-scheduled events as well as individual access for ongoing traditional cultural practices. Furthermore, the overall reduction in visitation under Alternative 4 would reduce the effects of crowding and enhance privacy for traditional cultural practices.

### ***Cultural ORV-9 – Yosemite Valley Archeological District***

The Yosemite Valley Archeological District is a linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River. Heavily-used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling stock trail use, parking and informal rock climbing can all affect ORVs in this area. Archeological resource protection would be achieved through actions in this plan to manage visitor use levels, divert foot traffic around sites, removing informal trails, and formalizing river and meadow access locations, mitigating ecological restoration practices by using noninvasive techniques wherever possible. Many of the actions related to ecological restoration in Segment 2, such as delineating roadside parking, would also help protect archeological sites by diverting foot traffic away from sites and into less sensitive areas. Actions to enhance the recreational ORV in Segment 2 would manage recreational users both in terms of flow and location of users at any one time. A reduction in people and vehicles at one time in Yosemite Valley could also reduce visitor use-related effects on archeological resources.

Site-specific treatment actions would be developed through site management plans, where necessary, to avoid resource loss through park actions (such as development, repair, and maintenance of facilities and underground utilities to support visitor use or natural forces).

Management considerations for this ORV also involve continuing to survey and monitor archeological resources as well as update required documentation.

Under Alternative 4 the free-flowing condition of the river would be enhanced by removing the Ahwahnee and Sugar Pine Bridges. Mitigation measures would be utilized to reduce localized impacts and ensure that this action would not cause adverse effects or degradation to ORV-9 on a segmentwide

**TABLE 8-96: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9**

Location	Action in Alternative 4	Impact on ORV-9
<b>Curry Village and Campgrounds</b>		
Upper and Lower River Campgrounds, North, Lower and Upper Pines, and Backpackers Campgrounds	All campsites within 100-year floodplain would be removed. Upper Campsite in culturally sensitive area.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Concessioner Stables	Remove the Concessioner Stable and the pack trail from the stable to Happy Isles; restore to natural conditions.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would protect cultural resources during facility removal and would locally protect the ORV. Change would not affect contributing element of the Archeological District.
The Ahwahnee Parking Lot	Redesign and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Yosemite Village Day-use Parking Area	The Concessioner General Offices, Garage, and the Bank Building are removed. Move the Camp 6 day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Housekeeping Camp Lodging	Remove 166 lodging units. Restore floodplain area.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Yosemite Village Concessioner Employee Housing	Temporary housing at Huff House and Boys Town is removed. Remove housing units (7 buildings, 64 beds) in rock fall hazard zone. Construct 16 buildings, housing 164 employees using the same dormitory prototype. Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Dr. and restore to natural conditions.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.

**TABLE 8-96: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9 (CONTINUED)**

Location	Action in Alternative 4	Impact on ORV-9
<b>Yosemite Lodge and Camp 4</b>		
West of Yosemite Lodge New Parking	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Yosemite Lodge Visitor Facilities	Retain existing lodging units (245 units).	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Change would not affect contributing element of the Archeological District due to location and level of use.
Yellow Pine, Camp 4, Yosemite Lodge, and West Valley Campgrounds.	Remove camping and restore the 100-year floodplain to natural conditions. Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Retain campground and administrative use sites in Yellow Pine.	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Archeological District.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Mitigation measures would protect cultural resources during facility relocation. Change would not affect contributing element of the Archeological District.
Northside Drive (Stoneman Bridge to Yosemite Village Day-use Parking Area)	Remove 900' of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.

basis. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Facilities that would remain in this segment of the river have no direct impact on the archeological component of the cultural ORV as indicated in the baseline condition assessment.

The NPS would delineate bike paths, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; remove graffiti at rock art and other sensitive features, conduct public education to discourage climbing, and remove climbing hardware from sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

**Conclusion:** Under Alternative 4, the archeological component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Localized visitor-use-related impacts to archeological resources would be addressed through various enhancement actions. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Reduction in maximum people

per day in Yosemite Valley, and management of user capacity and visitor use would reduce the potential for visitor use impacts.

### ***Cultural ORV-10 – Yosemite Valley Historic Resources***

As described in Chapter 5, the Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system. Protective actions to address management concerns related to the Yosemite Valley Historic Resources ORV-10 include:

- Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to “good” condition.
- Develop a Historic Structures Report for the LeConte Memorial Lodge NHL to determine the rehabilitation needs to bring the building to “good” condition.
- Rehabilitate the Superintendent’s House (Residence 1) per the Historic Structure Report (Lingo 2012) to bring the building to “good” condition. This rehabilitation of the building will occur under all action alternatives, regardless of whether the building is relocated.

Under Alternative 4 the free-flowing condition of the river would be protected by removing the Ahwahnee and Sugar Pine Bridges. Relocation of the Superintendent’s House (Residence 1) is proposed under Alternative 4 to address the 1982 Guidelines for the Wild and Scenic Rivers Act that requires managing agencies to consider relocation of major public use facilities outside of the river corridor. These three bridges and the Superintendent’s House (Residence 1) are components of the Yosemite Valley Historic Resources component of the cultural ORV in Segment 2. The NPS would document and interpret any building or structure threatened with removal or relocation. In this manner, while the individual tangible element or elements may be lost or moved, a record of their existence and historical significance would still be available to the public.

To address management considerations, the *Merced River Plan/DEIS* proposes continuing the active program of maintenance for historic buildings and structures; employing existing design guidelines to ensure that new development or redevelopment complements the ORV and the Yosemite Valley Historic District; and periodically assessing and updating professional documentation for the historic resources.

Ecological and scenic value restoration actions in Segment 2 would enhance the cultural landscape which contributes to the historic setting of the resources that comprise the ORV-10. There are no construction actions associated with Alternative 4 that would affect the spatial organization of the

**TABLE 8-97: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-10**

Location	Action in Alternative 4	Effects to ORV-10
<b>Curry Village and Campgrounds</b>		
Stoneman Meadow and Curry Orchard parking lot	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	Change would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective.
Ahwahnee Parking Lot	Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to "good" condition.	Redesign of the Ahwahnee Parking Lot would rehabilitate contributors to the cultural ORV thereby enhancing the Yosemite Valley Historic Resources ORV locally and segmentwide.
Yosemite Village Day-Use Parking Area	Remove Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Re-align the intersection at Northside Drive and Village Drive. Add a three-way intersection at Sentinel Drive and the entrance to the parking area. Provide on-grade pedestrian crossings.	The removal of historic and non-historic properties and re-alignment/re-establishment of the intersections would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
Sugar Pine and Ahwahnee Bridges	Remove both bridges and the connecting berm.	The action would remove 2 contributors to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of these two bridges would not result in a segmentwide adverse effect of the collective of resources.
Superintendent's House (Residence 1)	Relocate outside the river corridor to the NPS housing area. Rehabilitate historic structure in new location.	The action would remove a contributor to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of this resource would not result in a segmentwide adverse effect of the collective of resources.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	The action would affect trails that are connected by the historic footbridges which are components of the Yosemite Valley Historic Resources ORV. Mitigation measures and Section 106 review would ensure the protection of the historic resources and the redesign could result in enhancement of the ORV locally.

historic resource collective, though changes in the circulation patterns as a result of re-routing roads at the Yosemite Village day-use parking area and at Stoneman Meadow would affect circulation patterns that are associated with this ORV. These effects would be localized and would not affect the condition of the ORV on a segmentwide level.

**Conclusion:** Under Alternative 4, the historic resources component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of three bridges and the relocation of the Superintendent's House (Residence 1) would result in localized effects that would be mitigated through documentation and interpretation. Once removed or relocated, these resources would no longer be considered part of the ORV collective. All disturbances to circulation and spatial organization associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and documentation (as needed) to ensure that historic resources are protected.

### ***Scenic ORV-16 – Iconic Scenic Views in Yosemite Valley***

Visitors to Yosemite Valley experience scenic views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls. Actions intended to manage natural resources may include the use of prescribed fire or controlled burns to thin forests that are encroaching on meadows; cutting trees, tree branches or other vegetation by mechanical means; and the application of herbicides to control invasive species. Related actions intended to protect the Recreation ORV would limit the number of visitors to lessen visitor density and congestion at attraction sites and make improvements to the transportation system that would reduce automobile congestion. Air quality can affect visitors' ability to experience scenic values in Segment 2. The NPS would cooperate with regional authorities to reduce airborne contaminants caused by combustion, including carbon dioxide emissions, smoke caused by fire, particulate matter generated by construction, and to improve air quality conditions.

In consideration of Wild and Scenic River Act requirements that the NPS consider the presence of existing structures, major facilities and services provided for visitor use, the NPS would eliminate several structures and facilities in Segment 2 under this alternative. Under Alternative 4 actions would remove many structures at the Ahwahnee pool and tennis court. Removal of these structures could enhance scenic resources from specific locations. Ecological restoration actions in Segment 2 would enhance the meadow and riparian communities which contribute to the scenic values in Yosemite Valley. This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Facilities that would remain in this segment of the river have no direct impact on the scenic river value as indicated in the baseline condition assessment. Changes to parking and vehicle traffic in Yosemite Valley to enhance Recreational ORV- 20 particularly the removal of roadside parking along Sentinel Drive and restoration to natural conditions would enhance Scenic ORV-16.



**TABLE 8-98: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR SCENIC ORV-16**

Location	Action in Alternative 4	Effects to ORV-16
<b>System-Wide</b>		
Selected Scenic Vista Points	Selectively thin conifers and other trees and shrubs that encroach on selected scenic vista points. Remove unnecessary facilities and ensure that all future development satisfies objectives that provide low contrast ratings.	Changes would enhance the scenic values on a segmentwide level.
<b>Curry Village and Campgrounds</b>		
Yosemite Valley Campgrounds	All campsites within 150 feet of the river removed. New campsites installed at Upper Pines, Backpacker's, Boystown, Concessioner Stables, Camp 4, West of Lodge, and Upper and Lower River Campgrounds	Changes to campgrounds would not interfere with iconic scenery. Removal of campgrounds near the river will enhance viewsheds segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day-Use Parking Area/Village Center Parking Area	The Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 750 parking places.	Removal of buildings would enhance viewsheds locally.
Housekeeping Camp Lodging	Retain 100 lodging units, and remove 166 lodging units (83 duplex lodging units, 4 restrooms, store and office) out of the observed ordinary high water mark.	Removal of Housekeeping units near the river will enhance viewsheds locally.
Yosemite Village Concessioner Employee Housing	Temporary housing at Huff House and Boys Town is removed. Remove housing units (7 buildings, 64 beds) in rock fall hazard zone. Construct 16 buildings, housing 164 employees using the same dormitory prototype. Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Facilities are out of major viewsheds and changes would not interfere with iconic scenery.

**Conclusion:** Under Alternative 4, the scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Tree thinning and ecological restoration actions would improve natural scenic conditions. Removal of buildings at Housekeeping Camp, Yosemite Lodge, the Concessioner Garage, the Concessioner General Offices, and the Concessioner Stables would reduce intrusions on scenic resources. All parking lot and campground construction under this alternative would be subject to park standard operating procedures and subject matter expert review to ensure that scenic resources are protected.

### ***Recreational ORV-20– River-related Recreation in Yosemite Valley***

Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River. Throughout the Yosemite Valley segment, the river has provided the setting for recreational experiences such as fishing, floating, and sightseeing. Transportation is considered an important part of the visitor experience in Yosemite Valley because it is the means of access to recreational opportunities in Yosemite Valley. Management considerations address the amount of

vehicle traffic and the number of people at one time in Yosemite Valley at the peak times of day during the park's busy summer season.

All restoration actions to protect and enhance biological, cultural, geologic/hydrologic, and scenic ORVs would further enhance visitors' connections to the river and its values, which are essential to the recreational ORV in this segment. A reduction in day-use, camping, and lodging opportunities would reduce access to these recreational experiences, but would not cause adverse effects or degradation to ORV-20 on a segmentwide basis. The reduction of Housekeeping Camp would change the picture of overnight accommodations in Yosemite Valley, but overnight lodging would not be eliminated segmentwide, nor would an essential aspect of the recreational ORV be affected. There are also actions proposed in Alternative 4 that would improve picnicking, and wayfinding. Finally, commercial boating is limited to 75 boats at one time and private boating is limited to 100 trips per day in Segment 2, in this alternative which reduces crowding and increases the stretches of the river on which private boating and paddling is allowed, thereby enhancing key aspects of this recreational experience.

Chapter 6 provides a more detailed description of the day-visitor capacity management strategies that directly measure aspects of the Recreation ORV and outlines specific actions. These actions include:

- Utilize parking and traffic management staff to improve parking efficiency and traffic flow in Yosemite Valley and other locations where needed.
- Institute a transportation fee at entrance stations (for peak-use season).
- Divert vehicles to other destinations outside of Yosemite Valley when parking in the Valley fills.
- When all parking fills to capacity, day visitors would be diverted at checkpoints throughout the park and at entrance stations.
- East Valley day-use parking permits would be issued by advanced reservation and on a first-come-first-serve basis.

NPS would use the Highway Capacity Manual Pedestrian Level of Service (discussed further in Chapter 5) for evaluating the capacity and quality of service of transportation facilities, including walkways, multi-use paths, and similar pedestrian facilities. NPS would also monitor parking rates and vehicles at one time to ensure that they are not exceeding the management standard. Should specific trigger points be reached, the NPS would implement a series of specific actions to improve parking to an acceptable level. Similarly, should visitor densities begin to approach specific triggers; NPS would take steps to keep such densities within the management standard.

**Conclusion:** Under Alternative 4, the recreation ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season will significantly reduce crowding thereby enhancing the recreational ORV. All restoration actions would enhance opportunities to connect with the river and its values. The reduction in commercial services would affect opportunities for particular types of recreational activities, but would not affect the essential components of the recreation ORV on a segmentwide basis.

**TABLE 8-99: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR RECREATIONAL ORV-20**

Location	Action in Alternative 4	Effects to ORV-20
Segmentwide visitation	17,000 visitors per day	This reduction in visitation would reduce crowding and congestion thereby enhancing the recreation ORV on a segmentwide level.
Concessioner Stables	Redeveloped as a campground with 41 sites.	Changes would reduce opportunities for one type of recreational activity, but would not substantially alter components of the river recreation experience.
Curry Village Lodging	Lodging would include 355 units, (65 hard-sided units and 290 tents).	Changes to Lodge would reduce access to overnight accommodations. Lodge itself is not part of the ORV-20 but does facilitate access to ORV-20 for certain visitors. This use would remain.
Lower Rivers Nature Walk	Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	Change would improve interpretation of the river and its values, and would enhance the recreation ORV in this segment.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts	Removal of facilities would reduce opportunities for one type of recreation activities, but would not substantially alter components of the river recreation experience.
Segment wide River Access	Swimming and water play allowed in all segments except 6, impoundment. No commercial boating. Boating allowed on all segments except 6, impoundment. Private use limited to 100 trips per day/commercial to 75 boats at one time in Segment 2 between the Pines Campgrounds and Sentinel Beach.	Change would limit commercial boating and would limit the number of private boating. However, this change does not affect components of the recreational ORV. This reduction in boats enhances dispersed recreation along the river corridor.
Housekeeping Camp Lodging	Retain Housekeeping Camp in current configuration.	Changes similar to current conditions and would not substantially alter components of the river recreation experience.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	Change would cause improve circulation and wayfinding thus enhancing ORV-20.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Visitor Facilities	Remove 34 lodging units (232 units remain).	Removal of lodging would have local affect, but would not substantially alter components of the river recreation experience.
Yellow Pine, Camp 4, Yosemite Lodge, and West Valley Campgrounds.	Remove camping and restore the 100-year floodplain to natural conditions. Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Restore Yellow Pines site and restore group administrative use sites to natural conditions.	Reduction in the number of campsites limits access to these recreational experiences, but camping opportunities would continue and not substantially alter components of the river recreation experience.
Recreational Experience Quality	Reduction in available day-use parking, and implementation of an East Yosemite Valley Day-use Parking Permit system	This will enhance the recreational experience of segment 2 by reducing crowding at key attraction sites as well as access to these areas (along roadways, in parking lots, etc).

## Segment 3 – The Merced Gorge (Scenic Segment)

### *Scenic ORV-17 – Scenic View in the Merced River Gorge*

The Merced River drops 2,000 feet over 14 miles; a continuous cascade under spectacular Sierra granite outcrops and domes. There are no existing management considerations with respect to the Scenic ORV in the Merced River Gorge. Although there are some localized visual intrusions from essential facilities such as visitor parking areas, restrooms, the Arch Rock entrance station and the El Portal Road, these facilities are consistent with the scenic classification of this river segment. As explained in Chapter 5, this ORV is currently protected and enhanced.

This alternative does not propose any new development or landscape changes within the river corridor aside from improvements to existing roadside pullouts and drainage. These changes would not degrade or adversely impact the scenic ORV on a segmentwide basis. Although private vehicles and overall visitation during peak periods will be managed for East Yosemite Valley only, it is probable that visitation and visitors at one time in Segment 3 will also witness a reduction under this alternative. This reduction in visitation and visitors at one time may reduce vehicles per viewshed, thereby enhancing the scenic ORV. Monitoring associated with this ORV would ensure that the attributes that comprise this ORV remain within the accepted management class rating.

Alternative 4 would accommodate the same kinds and amounts of use that exist today in Segment 3. The types and levels of use in Segment 3 under this alternative would remain largely unchanged. Actions considered under Alternative 4 would cause no adverse effects or degradation to ORVs on a segmentwide basis.

**Conclusion.** Under Alternative 4, this scenic river segment would show little evidence of human activity and remain largely free of structures. The scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season in Yosemite Valley will significantly reduce the number of vehicles per viewshed in this segment. All restoration actions would further enhance scenic characteristics in this segment.

## Segment 4 – El Portal (Recreational Segment)

### *Geological/Hydrological ORV-7 – The Boulder Bar in El Portal*

Natural processes would continue to shape the landscape and the geologic ORV. The NPS has not identified any management considerations with respect to the El Portal boulder bar. Land use and facility actions proposed in this alternative would not affect this ORV. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection are necessary. Moreover, the types and levels of visitor and administrative use (e.g., housing, maintenance operations, office space, passive recreation) allowed under this alternative would not affect this ORV. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

**Conclusion.** Under Alternative 4, the geologic values of this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no actions that would affect the boulder bar in El Portal, and there are no ongoing concerns or considerations associated with this resource.

### ***Cultural ORV-11 – The El Portal Archeological District***

The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region. Four sites are known to have experienced particularly severe damage, most notably a large ancient village and cemetery.

To address management considerations pertinent to this river value, the NPS would undertake the following actions:

- Protective measures would ensure that exceptional sites would be protected from unmitigated effects that could lead to adverse effects or degradation on a segmentwide level. A plan of action for addressing the abandoned infrastructure on sites would be developed in consultation with traditionally-associated American Indian tribes and groups. Any solution(s) developed would also include a recommended approach for deterring visitor use within the sites.
- Informal trails, non-essential roads, and abandoned infrastructure would be removed to protect and enhance the archeological resources contributing to the ORV in Segment 4.
- Remove informal trails and non-essential roads.

There are no existing instances of adverse effect or degradation to this ORV. As discussed above, management considerations are present associated with abandoned infrastructure that remains on an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians. Management considerations are also associated with non-essential roads and trails that impact archeological sites. In recognition of the high cultural significance of these sites, this alternative requires the park to develop plans to remove abandoned infrastructure and non-essential roads. Restoration actions to establish a 2.5 acre recruitment area for Valley Oaks would further protect adjacent archeological resources. Construction of employee housing in Old El Portal, Abbieville, and Rancheria would be designed to avoid or mitigate threats and disturbances to archeological sites. Monitoring and protective measures would ensure that new use patterns associated with the new housing would not affect contributing elements of the El Portal Archeological District.

**Conclusion.** Under Alternative 4, the archeological resources in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of abandoned infrastructure, informal trails and non-essential gravel roads would enhance protection of archeological resources. Valley Oak restoration actions would protect adjacent archeological resources from further ground disturbance. Construction of new employee housing would be designed to avoid or mitigate effects to the El Portal Archeological District. New or altered visitor use patterns associated with the new housing development would be monitored and protective actions would occur if effects triggered responses.

**TABLE 8-100: SEGMENT 4 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-11**

Facility	Action in Alternative 4	Effects to ORV-11
<b>El Portal</b>		
Abbieville, Old El Portal, and Rancheria Flat Concessioner Employee Housing	New concessioner employee housing in Old El Portal (12 beds) and Rancheria Flat (96 beds). Remove or relocate 36 existing private residences at Abbieville out of the 150-foot riparian buffer.	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Abbieville Trailer Park Area	Develop El Portal Remote Visitor Parking Area in the Abbieville/Trailer Park area to provide 200 spaces of visitor parking serviced by regional transit. Adjacent to cultural resources, however only suitable location proximate with direct access to Highway 140.	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Mitigation measures would protect cultural resources during facility removal and ecological restoration. Change would continue to protect archeological resources locally.

## Segment 5 – South Fork Merced River Above Wawona (Wild Segment)

### *Biological ORV 1 – High-elevation Meadows and Riparian Habitat*

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Restoration actions to remove informal trails and charcoal rings to protect cultural resources proposed under this alternative would not affect high-elevation meadows. The NPS proposes no major facility or visitor use actions for Segment 5 under Alternative 4. The biological ORV in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level.

### *Cultural ORV-12 – Regionally rare archeological features representing indigenous settlement including archeological sites with rock ring features*

Three regionally rare prehistoric archeological sites are located along this segment of the South Fork of the Merced Wild and Scenic River corridor. The sites contain unique stacked rock ring constructions and rock alignments. Two sites also contain pine timber remains within the ring interiors or incorporated into the stacked rock courses. Rock constructions are considered fragile and highly subject to human alteration from camping and campfire building disturbances. Two of the South Fork sites are adjacent to formal NPS trails, increasing the likelihood of disturbance. The vicinity of the sites has not been systematically surveyed, and it is possible that additional rock ring sites may be present along the South Fork. Should additional rock ring sites be discovered in the monitoring process, they would also become a part of the South Fork ORV. To remedy these considerations, NPS would:

- Complete documentation of the features. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker). Remove informal trails and charcoal rings.



- Increase education and outreach to Wilderness travelers.

**Conclusion.** Under Alternative 4, the archeological resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no specific actions to manage user capacity, land use, and/or facilities under Alternative 4 within Segment 5 beyond those designed to protect and enhance ORV-12 that would impact components of Cultural ORV-12. Monitoring activities described in Chapters 5 and 8 would continue to protect and enhance Cultural ORV-12 to ensure there are no adverse effects or degradation to ORV-12 on a segmentwide basis.

### ***Scenic ORV 18 – Scenic Wilderness Views along the South Fork Merced River***

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

**Conclusion.** Under Alternative 4, the scenic resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. The scenic ORV for Segment 5 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## **Segment 7 – Wawona (Recreational Segment)**

### ***Biological ORV-3 – The Sierra sweet bay (*Myrica hartwegii*)***

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV would be determined by comparing populations located near Wawona Campground (an area that is likely to be disturbed by humans) with more remote populations that are less likely to receive such disturbance. This population of Sierra sweet bay is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

To ensure that this biological ORV is protected and enhanced through time, the NPS would monitor the condition of the Sierra sweet bay population to ensure early warning of conditions that require management action before impacts occur.

**Conclusion.** Under Alternative 4, the Sierra Sweet Bay in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Reduction in camping and visitor activity in the vicinity of Wawona Campground would enhance this resource.

**TABLE 8-101: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR BIOLOGICAL ORV-3**

Facility	Action in Alternative 4	Effects to ORV-3
<b>Wawona</b>		
Wawona Campground	Retains 72 sites and one group site. Remove 27 sites that are either within the 100-year floodplain or in culturally sensitive areas.	Action would improve the condition of the ORV by reducing the potential effects on this species associated with campground visitation.

### *Cultural ORV-13 – Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This district spans segments 5, 6, 7, and 8. Accordingly, the condition of this historic property is assessed at the property-level, rather than the segmentwide level. Segment 7 includes the remains of the U.S. Army Cavalry Camp A. E. Wood documenting the unique Yosemite legacy of the African-American buffalo soldiers and the strategic placement of their camp near the Merced River. There are several management considerations for this ORV: the Wawona Archeological District is subject to site-specific impacts from park operations, visitor use, artifact collection, vandalism, and ecological processes. The following actions would help to address these issues:

- Increase monitoring frequency at affected sites.
- At the district-wide level, revise the existing National Register nomination to reflect changes since its original writing, for example, incorporating newly discovered resources and documenting impacts.
- The Wawona Campground capacity would be reduced to 67 sites (including one group site). 32 sites are removed because they are either within the 100-year floodplain or in culturally sensitive areas.
- Remove informal trails and fire rings to prevent continuing disturbance.
- Develop site management plans as needed for sites with complex uses. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds
- Consider need for archeological site treatment measures to address impacts to shallow deposits of artifacts and features.

The NPS would delineate trails, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; conduct public education to discourage disturbance to sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

**TABLE 8-102: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-13**

Facility and Land Use	Action in Alternative 4	Effects to ORV-13
<b>Wawona</b>		
Wawona Campground Septic System	Remove septic system, and connect to the sewer system. Build a lift station above the campground to connect to the existing water treatment plant.	Mitigation measures would protect cultural resources during facility construction.
Wawona RV dump site	Relocate the dump site to an appropriate location away from the river.	Mitigation measures would protect cultural resources during facility removal and construction.
Wawona Store	Replace the existing public restroom facilities with larger restrooms to accommodate visitor use levels. Improve picnic area, redesign bus stop.	Mitigation measures would protect cultural resources during facility construction.
Wawona Swinging Bridge	Provide access to Swinging Bridge with access on the south side of the river, delineate trail, restrooms, waste disposal and parking.	Mitigation measures would protect cultural resources during facility construction. Restrooms and waste disposal will reduce threats and disturbances to adjacent archeological resources.

### ***Cultural ORV-14 – Wawona Historic Resources***

The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity. The Wawona Covered Bridge is in good condition, and there are no current management considerations associated with it, however the bridge requires maintenance to keep the historic structure in good condition in the face of adverse weather and visitor use.

The Wawona Hotel complex continues to serve its original purpose as a guest lodging facility. Management considerations related to the hotel complex involve concessioner operations, the need for regular and routine preservation maintenance, and periodic rehabilitation to ensure visitor safety.

- Regular and routine preservation maintenance, conducted in accordance with the Secretary of the Interior's Standards, would ensure that this upkeep protects the historic character of the buildings
- Periodic rehabilitation would involve subject-matter specialists in planning, design and implementation to ensure actions do not compromise the historical integrity of the complex
- Concessioner operations would ensure that any operational modifications or updates are appropriate and in keeping with the historic character of the complex.

To prevent future impacts, the NPS would monitor the condition of the bridge, and take specific actions should conditions exceed trigger points. Trigger points are selected to inform managers well in advance of adverse effects or degradation on the Wawona Covered Bridge. Management considerations for the Wawona Hotel complex include the need for regular and routine preservation maintenance, periodic rehabilitation, and ongoing operations that serve its continuing function as a historic lodging facility. To address these management considerations, the NPS would ensure that these activities would conform to the Secretary of the Interior's Standards for Treatment of Historic Properties.

**TABLE 8-103: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR WAWONA HISTORIC RESOURCES ORV-14**

Facility	Action in Alternative 4	Effects to ORV-14
<b>Wawona</b>		
Wawona Hotel	Retain 104 lodging units at the Wawona Hotel. Retain hotel restaurant, swimming pool and tennis court. Retain golf course and golf shop.	The action would retain contributors to the Wawona Historic Resource. The ORV would continue to be protected locally.

## Segment 8 – South Fork Merced River below Wawona (Wild Segment)

### *Biological ORV-3 — The Sierra sweet bay (Myrica hartwegii)*

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV in Segment 8 is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

### *Cultural ORV 13— Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This ORV in Segment 8 is in good condition, with no management considerations present. Management actions are not required at this time.

### *Scenic ORV-18 – Scenic Wilderness Views along the South Fork Merced River*

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

The scenic ORV for Segment 8 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## ALTERNATIVE 5

### River Value – Free-flowing Condition in all Segments

A free-flowing river, or section of a river, moves in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The current free-flowing condition of the

Merced River is fully protected and enhanced on a segmentwide basis. Riprap revetment, abandoned infrastructure within the bed and banks of the river, and bridges that constrict the flow of the river may produce localized effects on free-flowing condition of the river. Alternatives 2-6 would enact a comprehensive suite of actions to enhance the free-flowing condition of the river by removing 3,400 linear feet of riprap, and removing abandoned and unnecessary infrastructure from the river channel and its floodplain. Infrastructure that would be removed includes former sewage treatment facilities, sewer and water lines, and former bridge abutments. In addition, Alternative 5 would remove 435 linear feet of riprap from riverbank areas, beyond that proposed for removal under Alternatives 2-6.

Alternative 5 also proposes removal of Sugar Pine Bridge and the associated elevated multi-use trail connecting Sugar Pine Bridge and Ahwahnee Bridge. These features constrict flows during high-water events, and lead to accelerated riverbank, channel erosion, and prevent natural channel migration. The trail toward Lower Pines would require a new bridge to span a cut-off channel. Although the Stoneman and Ahwahnee bridges would remain under Alternative 5, the hydrological effects of these bridges would be mitigated with strategic placement of large wood on riverbanks, constructed log jams in the river channel, and the use of brush layering and other techniques to establish riverside vegetation and decrease erosion.

There are no new facilities proposed under Alternative 5 that would affect the free-flowing condition of the river. A number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/Geological ORVs). For example, the Yosemite Village Day-use Parking Area would be relocated 150 feet north of the river.

To protect the river's free flowing condition in the future, the NPS would require all proposed projects involving construction within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSR. Through this process, the NPS would ensure that water resources projects within the designated river corridor would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition.

Conclusion: The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis, although localized considerations such as intermittent riverbank and bridges that constrict the flow of the river are present. Alternative 5 proposes a comprehensive suite of actions to enhance the free-flowing condition of the river by removing riprap, removing unnecessary infrastructure in the river channel, and removing Stoneman Bridge, as it produces pronounced hydraulic constrictions at high water flows. There are no new facilities proposed under Alternative 5 that would affect the free-flowing condition of the river, and a number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/ Geological ORVs). The NPS would require all proposed projects within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSR to ensure that water resources projects would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition. The actions proposed under Alternative 5 ensure that there are no direct or adverse effects on free-flowing condition of the Merced River.

## River Value – Water Quality in All Segments

The water quality of the Merced River is extremely high, and the current water quality of the river is fully protected and enhanced on a segmentwide basis. Intermittent localized instances of contamination may occur that are associated with automotive fluids in surface water runoff, recreational vehicle dump stations in proximity to the river, and accelerated erosion with potential sediment loading in the river during high water flows. Alternatives 2-6 would apply mitigation measures to ensure that surface water runoff associated with parking areas protects the water quality of the Merced River and meets regulations. The Upper Pines recreational vehicle dump station would be moved away from the river, and the Odger's bulk fuel storage area in El Portal would be moved out of the 500-year floodplain. In addition, Alternative 5 would relocate the Yosemite Village Day-use Parking Area north, 150-feet from the river. All campsites and infrastructure currently within 100-feet of the river would be removed. The pack trail from Curry Village stables to Happy Isles would be re-routed farther away from the river. These actions would reduce and mitigate potential sources of pollutants.

Proposed ecological restoration actions, particularly the actions that re-establish riverbank vegetation and reduce erosion potential would further enhance water quality conditions. These ecological restoration actions are described in more detail in the discussion of the biological ORVs below and in Appendix E.

There are no new facilities proposed under Alternative 5 that would threaten the water quality of the river. In areas of new development or high-density use, sensitive riverbanks would be fenced to eliminate trampling. Trampling can lead to vegetation loss and exposed soil, leading to accelerated sediment deposition in the river. To ensure that existing high water quality conditions are maintained in the future under Alternative 5, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

**Conclusion.** Under Alternative 5, water quality in all segments of the Merced River corridor would continue to be absent of adverse effects and degradation, and the potential for localized instances of contamination would be strongly reduced. Alternative 5 would address localized issues by applying mitigation measures to ensure surface water runoff associated with parking areas meets state standards, move the Upper Pines recreational vehicle dump station away from the river, and remove the Odger's bulk fuel storage area from the 500-yr floodplain. Ecological restoration actions would decrease the potential for accelerated riverbank erosion and sediment loading during high water events.



**TABLE 8-104: CORRIDOR-WIDE ACTIONS AND THEIR IMPLICATIONS FOR WATER QUALITY**

Location	Action in Alternative 5	Effects to Water Quality
<b>Segment 2</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	Campsites within the 100-year floodplain would be removed. Designated river access and put in areas established at resilient areas, discourage access to sensitive areas. Upper Pines dump station relocated away from the river.	These changes would result in less erosion along the riverbank; water quality would be enhanced segmentwide.
New campsites at Upper Pines, Backpacker's, Camp 4, Eagle Creek, and Upper River Campgrounds	New campsites constructed at Upper Pines, Upper River, Backpackers, Eagle Creek, and Camp 4 out of the 150 foot riparian buffer.	Change would not result in additional water quality effects on a segmentwide level. Water quality would continue to be protected segmentwide.
Yosemite Village Day-Use Parking Area	Move the unimproved parking lot out of the 10-year floodplain and restore the riparian habitat adjacent to the river.	Change would result in less erosion and storm water run-off from the parking area; water quality would be enhanced locally.
Pack Trail from Concessioner Stables to Happy Isles	Reroute the pack stock trail from the Concessioner Stable farther north, adjacent to the Happy Isles Loop Road.	Change would result in less erosion from the stock trail. Water quality would be enhanced locally.
Housekeeping Camp Lodging	Retain 232 units and associated facilities. Remove 34 units out of the ordinary high water mark.	Fencing and designated river access points would also direct use to resilient areas resulting in less erosion. Water quality would be enhanced locally.
<b>Segment 4</b>		
NPS Maintenance and Administrative Complex	Existing parking area formalized and paved using best management practices	Change would result in less erosion and storm water concerns in the parking area; water quality would be enhanced locally.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Removal of bulk fuel storage from the 500-year floodplain would further protect water quality segmentwide.
<b>Segment 7</b>		
Wawona Campground	Replace current septic system with waste water collection system connected to the waste water treatment plant. RV dump site relocated away from the river.	Change would result in less potential for storm water concerns in the campground; water quality would be enhanced locally.
Wawona Picnicking	Delineate boundaries of two formal picnic areas with formal river access points.	Change would result in less erosion along; water quality would be enhanced locally.

## Segment 1 – Merced River Above Nevada Fall (Wild Segment)

### *Biological ORV-1 – High-elevation Meadows and Riparian Habitat*

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Primary actions to protect and improve Biological ORV 1 include removal of informal trails that incise meadow habitat, trails in wet and/or sensitive vegetation, and trails that fragment meadow habitat, including trails in the Triple Peak Fork meadow, wetlands near Echo Valley and Merced Lake shore, mineral springs

between Merced Lake and Washburn Lake, and other areas as necessary. Removal of social trails that bisect the meadows would improve conditions in this segment because soil compactions and habitat fragmentation would be reduced. Grazing capacities would be established, monitored, and adapted as necessary which would also reduce soil compaction and habitat fragmentation, thus further enhancing meadow health.

Facilities that would remain in this segment of the river include the Merced Lake High Sierra Camp, designated camping areas in Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Area (including associated trails and footbridges). As described in Chapter 5, these facilities are not adversely impacting the Biological ORV. This alternative would nevertheless reduce the size of the High Sierra Camp by 18 beds and apply additional seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones as indicated. These changes would reduce use levels near the riverbank and result in some improvement to riparian conditions in the immediate vicinity of these camping areas.

As described in Chapter 5, to ensure this ORV is protected and enhanced through time, the NPS would monitor three indicators to assess the condition of the ORV: meadow bare soil, meadow fragmentation due to the proliferation of informal trails, and streambank stability. The NPS would establish a baseline for all three indicators using site-specific monitoring protocols by 2013. Regular monitoring would also reveal whether assumptions about human behaviors and actions taken to correct past actions are sustaining conditions above the management standard. If conditions have reached trigger points; the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects. The meadow monitoring programs for the biological ORV would monitor meadow fragmentation to ensure that use levels from hikers, backpackers and stock users do not result in meadow fragmentation or bare ground in excess of the management standards prescribed to protect and enhance meadows.

**TABLE 8-105: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-1**

Location	Action in Alternative 5	Effects to ORV-1
Meadow trails	Remove informal trails that incise meadow habitat.	Change reduces effects to wet and sensitive meadows and results in localized enhancement to ORV-1.
Merced Lake High Sierra Camp	Reduce the Merced Lake High Sierra Camp, to 11 units (42 beds). Replace the flush toilets with composting toilet.	Facility is not directly adjacent to meadows. Changes would not affect high-elevation meadow and riparian habitat, this ORV would continue to be protected locally.
Private boating would be allowed in this segment	Boating would consist of short floats using pack raft or other craft that can easily be carried. Put-ins and take-outs would be undesignated and dispersed. Only ten boats per day allowed - permit would be required.	Limited numbers would protect riparian habitat from trampling and bank erosion that could result with unlimited access.
Wilderness zone capacity	All zone capacities within the Merced WSR Corridor remain the same as currently managed.	Current zone capacities are designed to protect wilderness character including natural conditions such as riverbanks and meadows. Action would not affect high-elevation meadow and riparian habitat, this ORV would continue to be protected on a segmentwide level.

**Conclusion.** Under Alternative 5, the biological ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance riverbanks and meadows. Removal of social trails, grazing changes in Merced Lake East Meadow, and slightly reduced use of the Merced Lake High Sierra Camp would improve meadow conditions in this segment and thereby enhance the biological ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures. Facilities that would remain in this segment of the river include Merced Lake High Sierra Camp, Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the Biological ORV in this segment indicates that these facilities are not adversely affecting the Biological ORV.

### ***Geological/Hydrological ORV-4 – Glacially-carved Canyon in the Upper Merced River Canyon***

As discussed in Chapter 5, there are no management considerations with respect to the U-shaped, glacially carved canyon above Nevada Fall. This ORV is currently protected and enhanced within the meaning of the Wild and Scenic Rivers Act. Alternative 5 does not propose any actions that would change the condition of this ORV over time. Further, the U-shaped, glacially carved attributes of this ORV would not be affected by the types and levels of use authorized under this alternative, which are all directed toward wilderness oriented recreation. The NPS would nevertheless monitor the condition of this ORV to ensure that its condition does not decline.

### ***Scenic ORV-15 – Scenic Views in Wilderness***

Visitors to this Wilderness segment experience scenic views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks. Management considerations associated with the condition of the scenic river above Nevada Fall include contributions of regional air pollution (primary factors contributing to this condition are outside of NPS jurisdiction), visual intrusions of temporary and permanent structures, and crowding in and near wilderness campgrounds. There are few “visual intrusions” noted beyond the High Sierra Camp and other designated camping areas. However, these effects are local in nature and do not degrade the ORV on a segment wide basis. The NPS would ensure that Merced Lake High Sierra Camp and other designated camping areas are maintained in a clean and tidy condition. Under Alternative 5, High Sierra Camp tent fabric would be replaced with colors that blend within the landscape, such as gray, brown or green, so as to reduce contrast (the tents are currently white canvas). These changes would be expected to blend quite well with the native landscape. These measures would enhance the scenic ORV in localized areas. Other visitor use management actions under Alternative 5 would reduce crowding, thus additionally enhancing this ORV on a segmentwide basis.

**TABLE 8-106: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR SCENIC ORV-15**

Location	Action in Alternative 5	Effects to ORV-15
Merced Lake High Sierra Camp	Retain the Merced Lake High Sierra Camp, reducing the capacity to 11 units (42 beds). Replace tent fabric with colors that blend within the landscape.	Change would enhance ORV because the reduced infrastructure that remains would better blend in to the natural environment.
Designated Camping Areas	Retain the Merced Lake Backpackers, Little Yosemite Valley, and Moraine Dome designated camping areas.	Designated camping areas within the segment are currently protective of river values on a segmentwide level.
Facilities retained	Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp	These facilities and associated administrative uses and maintenance do not affect scenic values on a segmentwide level. The ORV would continue to be protected segmentwide.

The ORV is determined to be in the protected state, as defined by an absence of adverse effects and degradation, although intermittent air quality concerns are present. Because of the ambient nature of air quality, it cannot be managed exclusively for the river corridor. Facilities that would remain in this segment of the river include Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the scenic ORV in this segment indicates that these facilities are not adversely affecting the scenic ORV.

**Conclusion.** Under Alternative 5, the scenic ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance scenic values in this segment. Reduction of the Merced Lake High Sierra Camp units (and replacing tent fabric) would address scenic considerations in this segment, which focus on the High Sierra Camp and thereby enhance the scenic ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures.

### ***Recreational ORV-19 – Wilderness Recreation above Nevada Fall***

Visitors to federally designated Wilderness in Segment 1 would engage in a variety of river related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the Wilderness experience. The current condition of this ORV is at or above the management standard at the segment level. Localized management concerns in this segment relate to crowding at Little Yosemite Valley and Moraine Dome backpackers campgrounds, high use levels at the Merced Lake Backpackers Camping Area, and high encounter rates along the trails that connect these areas. Crowding and high use levels affect the Wilderness experience, which is an integral part of the recreational ORV in this segment.

This alternative would retain the High Sierra Camp at a reduced level. The capacity of the Little Yosemite Valley Wilderness Zone would remain at 150. Actions in Alternative 5 would reduce the size of the High Sierra Camp by 18 beds and apply additional seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones as indicated in Appendix L. These changes would reduce use levels and result in some decreased use in the immediate vicinity of these camping areas. These changes would reduce use crowding, high use levels, and increase opportunities for solitude in this Wilderness segment.

**TABLE 8-107: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR RECREATION ORV-19**

Location	Action in Alternative 5	Effects to ORV-19
Merced Lake High Sierra Camp	Retain the Merced Lake High Sierra Camp, reducing the capacity to 11 units (42 beds). Replace the flush toilets with composting toilet.	The actions would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.
Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Areas	Retain as designated camping. Replace flush toilets with composting toilet at the Merced Lake Backpackers Camping Area.	Opportunities for solitude and primitive elements of wilderness character would be enhanced locally at Little Yosemite Valley and Merced Lake Backpacker's designated camping areas due to the reduction in crowding and opportunity to camp out of sight and sound of other campers. The recreation ORV would continue to be protected on a segmentwide level.
Private boating would be allowed in this segment	Swimming and water play allowed. Boating would consist of short floats using pack raft or other craft that can easily be carried. Put-ins and take-outs would be undesignated and dispersed. Permits required for private boating. No commercial boating. Private use limited to 10 boats per day with backcountry permit on Segment 1.	Permitted use would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.
Wilderness zone capacity	All zone capacities within the Merced WSR Corridor remain the same as currently managed.	The actions would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.

Facilities that would remain in this segment of the river include designated camping areas in Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Area (including associated trails and footbridges) and the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. These facilities do not have an adverse effect on the Wilderness experience integral to this Recreational ORV.

NPS would monitor visitor encounter rates to ensure that they are not exceeding established standards. Should specific trigger points be reached, the NPS would be required to implement a series of specific actions to reduce visitor levels to an acceptable level. These actions increase in severity as the current condition ORV condition moves away from the management standard to ensure proper course correction and re-establishment of the management standard. These trigger points were selected to inform managers in advance of any adverse effects or degradation to this ORV.

Conclusion: Under Alternative 5, actions would not substantively change existing wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.

## Segment 2 – Yosemite Valley (Recreational and Scenic Segments)

### *Biological ORV-2 – Mid-elevation Meadows and Riparian Habitat*

The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada. Actions to protect and enhance Biological ORV-2 under Alternative 5 include:

- Removal of informal trails in meadows where they fragment meadow habitat or cross through sensitive, wet vegetation communities. Overall, restore six miles of informal trails throughout Yosemite Valley;
- Use boardwalks or hardened surfaces to allow access to sensitive areas;
- Delineation of trails through upland areas and along meadow perimeters;
- De-compacting trampled soils and consolidate multiple parallel trails;
- Re-directing visitor use to more stable and resilient river access points such as sandbars, and designate formal river access sites. Establishing fencing and signage to protect sensitive areas; install boardwalks where appropriate, and actively revegetate where needed;
- Relocate or remove all campsites at least 100 feet away from the ordinary high-water mark;
- Restoration of the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest at specific locations in Yosemite Valley. Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure re-design. Alternative 5 would include 203 acres ecological restoration.
- Installation of constructed log jams in the river channel between Clark’s Bridge and Sentinel Bridge to remediate river widening and improve channel complexity would also contribute to improving riparian health.
- Day use parking capacity is expanded and formalized. A total of 2,448 visitor parking spaces would be provided in the Valley accommodating a maximum of 7,549 people at one time to Segment 2. Managing access and other proactive restoration measures would protect Biological ORVs by during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Biological ORVs by removing these uses from the river corridor and managing access in the corridor.

This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Under this alternative, all roads, buildings, campgrounds, trails, utilities and infrastructure, and other facilities in this segment with current local effects on the biological ORV would be removed, reduced, or relocated. Facilities that would remain in this segment of the river, including the Ahwahnee Hotel and Yosemite Lodge have no direct impact on the biological river value as indicated in the baseline condition assessment. Effects to the free-flowing condition of the river as a result of the bridges that would remain under this alternative would be mitigated through constructed log jams.

Some associated facilities are proposed for relocation as described below.



The NPS would monitor three indicators to assess the condition of ORV 2: meadow fragmentation resulting from informal trails, the status of riparian habitat, and riparian bird abundance. As described in Chapter 5, adverse effects and degradation are not present in relation to the meadow fragmentation indicator.

Management concerns in meadows are present; however, actions to address informal trailing impacts and fragmentation would be taken at all meadows where these concerns have been documented. Initial surveys of the riparian status indicator in 2010 indicate that degradation is not present, but management concerns are also present in the riparian corridor.

The NPS is beginning to monitor the third indicator in this segment, riparian bird abundance. The first status assessments would take place in 2013, after one year of monitoring. The next assessment requires information from two out of three years.

To ensure Biological ORV-2 is protected by this plan and protected and enhanced through time, the NPS would continue to monitor the condition of the ORV to provide early warning of conditions that require management action before impacts occur. Regular monitoring would also reveal whether conditions have reached trigger points; and, if so, the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects.

**TABLE 8-108: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2**

Location	Action in Alternative 5	Effects to ORV-2
Segmentwide Restoration	Restoration includes restoration of meadow habitat, removal of informal trails, riparian restoration and establishment of designated river access points, and use of boardwalks and hardened surfaces.	Actions would enhance the biological ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within 100 feet of the river would be removed. Designated raft put-in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged; the biological ORV would be enhanced segmentwide.
New campsites at Upper Pines, Backpacker's, Eagle Creek, Camp 4, and Upper River Campgrounds	New campsites constructed at Upper Pines, Upper River, Backpackers, Camp 4 and Eagle Creek out of the 150 foot riparian buffer.  Lower River: Designate river access at Housekeeping Camp eastern beach.	Actions would protect riparian areas from direct impacts related to the increase in visitor activity in these areas. Fencing and designated river access points would also direct use to resilient areas. Monitoring would proactively assess the effectiveness of these actions and established triggers to ensure that future protective measures are implemented in a timely manner. Change would result in protection of biological ORV in this segment.

**TABLE 8-108: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2 (CONTINUED)**

Location	Action in Alternative 5	Effects to ORV-2
<b>Curry Village (cont)</b>		
Curry Orchard Day Use Parking Area	Provide 430 parking spaces through a re-design of the parking lot.	Actions include engineering solutions to promote water flow and increase drainage to Stoneman Meadow protecting and improving meadow health resulting in enhancement of the ORV locally.
Ahwahnee, Stoneman and Sugar Pine Bridges	Ahwahnee and Stoneman bridges would be retained. Sugar Pine Bridge would be removed.	Removal would reduce channel widening, erosion, and scouring thereby enhancing local riparian communities. Existing riparian impacts mitigated with strategic placement of large wood on riverbanks and the addition of brush layering and constructed log jams to address scouring resulting in enhancement of the ORV locally.
<b>Yosemite Village and Housekeeping Camp</b>		
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 units out of river bed and banks. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.	These changes would reduce effects to riparian corridor and locally enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches. The ORV would be enhanced locally.
Ahwahnee Row and Tecoya Dorms Concessioner Housing	Create 50-foot setback from Indian Creek – ecologically restore the riparian habitat and protect by restoration fencing.	Changes would result in reduction of residential activities in riparian areas; biological ORV would be enhanced locally.
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Drive and restore to natural conditions.	These changes would remove uses from the meadow edge thus reducing erosion and trampling impacts and enhancing ORV components locally.
Yosemite Village Day Use Parking Area/Roundabout	Move the Yosemite Village Day Use Parking Area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places. Build a traffic circle at the Village Drive and Northside Drive intersection at Yosemite Village Day Use Parking Area.	The extent of construction would partially encroach into Cook's Meadow; however riparian habitat would be enhanced by moving development away from the river. Mitigations would compensate wetland loss, and protect sensitive areas from staging impacts such as compaction and erosion. While Cook's Meadow may be affected locally, the ORV would continue to be protected segmentwide.
<b>Yosemite Lodge And Camp 4</b>		
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area outside of the river corridor.	Relocation of this facility outside of the river corridor may reduce informal trailing in the adjacent meadow thereby enhancing the ORV locally.
Northside Drive (Stoneman Bridge to Yosemite Village Day Use Parking Area)	Facility retained. A component of the primary transportation & circulation road system that connects all major visitor service nodes. Hydrologic connectivity improved by increasing culverts.	Facility has a localized effect on the ORV as road bisects meadow; ORV would continue to be protected segmentwide.

**Conclusion:** Under Alternative 5, the biological ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Actions would further enhance riverbanks and meadows. Removal or relocation of select campsites and infrastructure and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV.

The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### ***Geological/Hydrological ORV-5 – The “Giant Staircase”***

The NPS has no immediate management considerations with respect to the Giant Staircase characteristic of the geology of Yosemite Valley above Happy Isles as this geologic ORV is determined to be absent of adverse effects and degradation. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### ***Geological/Hydrological ORV-6 – Rare, Mid-elevation Alluvial River***

As described in Chapter 5, the NPS selected the status of riparian habitat as the indicator to specifically assess the effectiveness of actions designed to protect this and other ORV. This ORV integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities.

The following actions are included to specifically protect and enhance Free-flowing Conditions and Biological ORV-2, but would also address the protection and enhancement of ORV-6.

- Large wood, constructed log jams, and brush layering would be used in the vicinity of bridges to decrease bed scouring and streambank instability. Riprap would be removed where possible and replaced with native riparian vegetation, using bioengineering techniques. In the event that such actions do not improve conditions, bridge redesign or removal could be reconsidered.
- Under Alternative 5 the free-flowing condition of the river would be enhanced by removing Sugar Pine Bridge. Mitigation measures would be employed during removal and the long-term recovery of the area is expected. Restoring free-flowing conditions would enhance riparian communities associated with ORV-6.
- Removing abandoned underground infrastructure, along the river corridor would be part of a comprehensive strategy to correct altered surface and subsurface hydrology.
- Remove riprap where riverbanks do not need stabilization to allow for channel migration. Replace riprap with bioengineered riverbanks, integrating native riparian vegetation, where riverbank stabilization is necessary for protection of critical infrastructure.

**TABLE 8-109: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR GEOLOGICAL/HYDROLOGICAL ORV-6**

Location	Action in Alternative 5	Effects to ORV-6
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within 100 feet of the river would be removed. Designated raft put-in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged; the biological ORV would be enhanced segmentwide.
Curry Village Lodging	Lodging would include 453 units, (290 tents and 163 hard-sided units)	Lodging is outside the 100-year floodplain and is not causing adverse effects or degradation to ORV-6 segmentwide.
Ahwahnee and Stoneman Bridges	Both these bridges are retained. Existing riparian impacts mitigated with strategic placement of large wood on riverbanks and the addition of brush layering and constructed log jams to address scouring.	Changes would improve riparian areas and channel complexity; the biological ORV would be enhanced segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center	Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places.	These changes would reduce effects to riparian corridor and locally enhance ORV components as use would be relocated away from areas critical to river or meadow function; the biological ORV would be enhanced locally.
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 units out of observed ordinary high water mark. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.	These changes would reduce effects to riparian corridor and locally enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches. The ORV would be enhanced locally.
Ahwahnee Row and Tecoya Dorms Concessioner Employee Housing	Remove housing and development out of the 100-year floodplain, recontour topography, decompact soils, and restore stream hydrologic function.	Changes would result in reduction of residential activities in riparian areas; biological ORV would be enhanced locally.
Yosemite Village Day Use Parking Area /Roundabout	Construct a traffic circle at Yosemite Village Day Use Parking Area parking area to address congestion at intersection. Additionally, re-route Northside Drive south of the parking area to alleviate pedestrian/vehicle conflicts.	The extent of construction would encroach into Cook's Meadow; however wetlands would be restored by moving development away from the river. A net increase in wetland areas is expected. Mitigations would protect sensitive areas from staging impacts such as compaction and erosion. While the traffic circle and realignment of Northside Drive may affect the hydrologic processes of the alluvial river locally, the ORV would be protected segmentwide.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	Construct 300 vehicle parking spaces and 15 tour bus parking spaces.	Implementation of mitigation measures would protect the floodplain from erosion and other disturbance during construction. The ORV would continue to be protected locally.
Yosemite Lodge Visitor Facilities	Retain the existing 245 units.	Lodging is outside the 100 year floodplain and is not causing adverse effects. The ORV would continue to be protected locally.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Lodging is outside the 100 year floodplain and is not causing adverse effects. The ORV would continue to be protected locally.

## ALTERNATIVES

Yellow Pine Administrative Site	Retain 4 group administrative use sites (up to 120 people).	Campground is within floodplain but would undergo restoration and is not impacting areas critical to alluvial river function. The ORV would continue to be protected segmentwide.
Yosemite Lodge Road and Northside Drive	Construct a pedestrian underpass and roundabout to address congestion at intersection and alleviate pedestrian/vehicle conflicts. Roadside parking would be removed and more culverts would be added. Implementation of mitigations would protect the riparian corridor from erosion, pollutants, and general habitat disturbance during construction.	Changes would remove and redirect uses from the riverbank thus reducing erosion and trampling impacts in riparian corridor. Underpass not likely to affect geological and hydrological processes. The ORV would continue to be protected locally.
El Capitan Crossover	Facility retained. This roadway segment is a key connector between Northside and Southside Drives and serves as a exit point at west end of Yosemite Valley.	Bridge protects riparian habitat from destruction caused by random crossings throughout the river corridor; the ORV would continue to be protected locally.
Northside Drive (Stoneman Bridge to Yosemite Village Day Use Parking Area)	Remove portion of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Removes facility that currently has a localized effect on the ORV. Restoration enhances the ORV locally.

To ensure this ORV is protected and enhanced through time, the NPS would monitor the condition of the ORV using the status of riparian habitat as an indicator, and take specific actions should conditions reach trigger points.

**Conclusion.** Under Alternative 5, the geologic/hydrologic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would enhance the 10 and/or 100-year floodplains and this ORV. Actions to protect and enhance free-flowing conditions as well as meadows and riparian complexes in Segment 2 would result in additional enhancement of the geologic/hydrologic ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### *Cultural ORV-8 – Yosemite Valley American Indian Ethnographic Resources*

As described in Chapter 5, Yosemite Valley American Indian ethnographic resources include relatively contiguous and interrelated places that are inextricably and traditionally linked to the history, cultural identity, beliefs, and behaviors of contemporary and traditionally-associated American Indian tribes and groups. Management considerations related to ethnographic resources involve park operations, crowding, and visitor use. Actions included in the Merced River Plan/DEIS include:

- Continue coordination between traditionally associated American Indian tribes, groups, and traditional practitioners (through the Park American Indian Liaison) with law enforcement, fire management, interpretation, invasive species, ecological restoration, and facilities management programs;
- Continue to provide operational guidelines for material staging areas, parking, etc. to protect ethnographic resources;

- Ensure access for traditionally-associated American Indians for participation in annually scheduled traditional cultural events. In addition, tribal access for the personal conduct of ongoing traditional cultural practices would be assured through the Yosemite tribal fee waiver pass program.
- Reduce and formalize day-use parking capacity Manage access in Segment 2 to protect traditionally-used plant populations in the river corridor during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Cultural ORVs by removing these uses from the proximity of several cultural resources.

Threats to traditionally-used plant populations include invasive species such as Himalayan Blackberry (*Rubus armeniacus*), drainage and hydrology impacts to meadows, and erosion and revetments that affect riparian vegetation. The *Merced River Plan/DEIS* would address these considerations through the following actions:

- The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program would address impacts to some traditionally-used plant populations in some locations.

**TABLE 8-110: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR CULTURAL ORV-8**

Location	Action in Alternative 5	Effects to ORV-8
Visitation	19,900 people per day	This level of visitation may continue to result in a lack of privacy for traditional cultural practices in specific locations seasonally. Access to annually-scheduled traditional cultural events and personal conduct of traditional cultural practices would be assured thereby continuing protection of the ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
Traditional Cultural Property Documentation	Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary	Documentation, mapping, and evaluation would provide the detail necessary to protect and enhance the ORV segmentwide.
Upper Pines, Backpacker's, Eagle Creek, Camp 4, and Upper River Campgrounds	All campsites within 150 feet of the river would be removed. New campsites constructed at Upper Pines, Backpacker's, Eagle Creek, Camp 4, and Upper River Campgrounds. Designated boating put in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged.
Curry Village Lodging	Lodging would include 453 units, (163 hard-sided units and 290 tents).	Lodging is outside the 100 year floodplain and is not causing adverse effects or degradation to ORV-6 on a segmentwide basis.
<b>Yosemite Village and Housekeeping Camp</b>		
Housekeeping Camp Lodging	Retain 266 lodging units.	These changes would reduce effects to riparian corridor and locally enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	West of Yosemite Lodge re-developed to provide additional 150 day use parking spaces.	Implementation of best management practices would protect the floodplain from erosion and other disturbance. The ORV would continue to be protected locally.
Yosemite Lodge Parking	25 additional spaces added at Yosemite Lodge due to redesign, improving parking efficiency near Northside Drive.	Implementation of best management practices would protect the floodplain from erosion and other disturbance. The ORV would continue to be protected locally.



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Yosemite Lodge Visitor Facilities	Retain existing 245 rooms.	Lodging is outside the 100-year floodplain and is not affecting the riparian and hydrologic processes. The ORV would continue to be protected locally.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Lodging is outside the 100-year floodplain and is not affecting the geologic and hydrologic processes. The ORV would continue to be protected locally.
Yellow Pine Administrative Campground	Retain 4 group administrative use sites (up to 120 people).	Yellow Pines is used for overflow camping during annual traditional cultural events. Retention of this campground continues to protect the ORV segmentwide.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Relocation of this facility outside of the river corridor may reduce informal trailing in the river corridor. Restoration will allow for recruitment of desirable black oaks in this area. The ORV would be enhanced locally.
Eagle Creek New Campground	New campground developed east of El Capitan Picnic Area with two group auto campsites.	Implementation of mitigation measures would protect planted areas from disturbance during construction; the ORV would continue to be protected locally.

- Restoration actions to protect riparian areas, meadows, and hydrological resources would further contribute to the protection and enhancement of the traditional-use plant communities included in this ORV.
- Introduction of seedlings to affected stands of black oaks and protection as necessary to ensure that ratios of adults to saplings is at least 0.65.
- Primary actions to manage major vista points under Scenic ORV-16 include mechanical thinning or removal of conifer trees. This action would be coordinated to ensure that the ORV-8 trigger point for the ratio of sapling to adult trees is not exceeded.

Facilities that would remain in this segment of the river have no direct impact on the ethnographic component of the cultural ORV as indicated in the baseline condition assessment.

The *Merced River Plan/DEIS* proposes a variety of actions to address specific considerations including continued coordination between traditionally associated American Indian tribes, groups, and traditional practitioners and the NPS; continued access for traditionally associated American Indians for participation in annually scheduled traditional cultural events; and ecological restoration actions to protect and enhance traditionally used plant populations. To prevent future impacts, the NPS would monitor the condition of the ORV, and take specific actions should additional trigger points be exceeded.

**Conclusion.** Under Alternative 5, the ethnographic component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Actions to protect and enhance floodplains, meadows and riparian complexes in Segment 2 would result in additional enhancement of the traditionally-used plant resources of the ethnographic component of the cultural ORV. Actions that would remove infrastructure and restore black oak woodlands would also enhance a critical component of this ORV. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would not limit access to traditional practitioners because measures would be in place to ensure access to annually-scheduled events as well as individual access for ongoing traditional cultural practices. Furthermore, the overall reduction in visitation under Alternative 5 would reduce the effects of crowding and enhance privacy for traditional cultural practices.

***Cultural ORV-9 – Yosemite Valley Archeological District.***

The Yosemite Valley Archeological District is a linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River. Heavily-used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling stock trail use, parking and informal rock climbing can all affect ORVs in this area. Archeological resource protection would be achieved through actions in this plan to manage visitor use levels, divert foot traffic around sites, removing informal trails, and formalizing river and meadow access locations, mitigating ecological restoration practices by using noninvasive techniques wherever possible. Many of the actions related to ecological restoration in Segment 2, such as delineating roadside parking, would also help protect archeological sites by diverting foot traffic away from sites and into less sensitive areas. Actions to enhance the recreational ORV in Segment 2 would manage recreational users both in terms of flow and location of users at any one time. A reduction in people and vehicles at one time in Yosemite Valley could also reduce visitor use-related effects on archeological resources.

**TABLE 8-111: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9**

Location	Action in Alternative 5	Impact on ORV-9
<b>Curry Village and Campgrounds</b>		
Upper and Lower River Campgrounds, North, Lower and Upper Pines, and Backpackers Campgrounds	All campsites within 100-year floodplain would be removed. Upper Campsite in culturally sensitive area.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Curry Village Lodging	Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Huff House Employee Housing	Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility removal. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
The Ahwahnee Parking Lot	Redesign and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.

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Camp 6/Village Center Parking Area	The Concessioner General Offices, Garage, and the Bank Building are removed. Move the Camp 6 day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places. Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area and construct a traffic circle at Northside Drive/Village Drive to address traffic congestion and pedestrian/vehicle conflicts.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility removal and construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Housekeeping Camp Lodging	Remove 34 lodging units – retain 232 units.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility removal. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Yosemite Village Concessioner Employee Housing	Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
<b>Yosemite Lodge and Camp 4</b>		
West of Yosemite Lodge New Parking	West of Yosemite Lodge re-developed to provide additional 300 day use parking spaces.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
Yosemite Lodge Visitor Facilities	Retain existing lodging units (245 units).	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility removal and construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Camp 4 and Yellow Pines Campground	Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Retain campground and administrative use sites in Yellow Pine.	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV locally.
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.

Site-specific treatment actions would be developed through site management plans, where necessary, to avoid resource loss through park actions (such as development, repair, and maintenance of facilities and underground utilities to support visitor use or natural forces).

Management considerations for this ORV also involve continuing to survey and monitor archeological resources as well as update required documentation.

Under Alternative 5 the free-flowing condition of the river would be enhanced by removing the Sugar Pine Bridge. Mitigation measures would be utilized to reduce localized impacts and ensure that this action would not cause adverse effects or degradation to ORV-9 on a segmentwide basis. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Facilities that would remain in this segment of the river have no direct impact on the archeological component of the cultural ORV as indicated in the baseline condition assessment.

The NPS would delineate bike paths, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; remove graffiti at rock art and other sensitive features, conduct public education to discourage climbing, and remove climbing hardware from sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

**Conclusion:** Under Alternative 5, the archeological component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Localized visitor-use-related impacts to archeological resources would be addressed through various enhancement actions. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would reduce the potential for visitor use impacts.

### ***Cultural ORV-10 – Yosemite Valley Historic Resources***

As described in Chapter 5, the Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system. Protective actions to address management concerns related to the Yosemite Valley Historic Resources ORV-10 include:

- Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to “good” condition.
- Develop a Historic Structures Report for the LeConte Memorial Lodge NHL to determine the rehabilitation needs to bring the building to “good” condition.
- Rehabilitate the Superintendent’s House (Residence 1) per the Historic Structure Report (Lingo 2012) to bring the building to “good” condition. This rehabilitation of the building will occur under all action alternatives, regardless of whether the building is relocated.

Under Alternative 5 the free-flowing condition of the river would be protected by removing the Sugar Pine Bridge. Relocation of the Superintendent's House (Residence 1) is proposed under Alternative 5 to address the 1982 Guidelines for the Wild and Scenic Rivers Act that requires managing agencies to consider relocation of major public use facilities outside of the river corridor. The bridge and the Superintendent's House (Residence 1) are components of the Yosemite Valley Historic Resources component of the cultural ORV in Segment 2. The NPS would document and interpret any building or structure threatened with removal or relocation. In this manner, while the individual tangible element or elements may be lost or moved, a record of their existence and historical significance would still be available to the public.

**TABLE 8-112: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-10**

Location	Action in Alternative 5	Effects to ORV-10
Segmentwide visitation	19,900 visitors per day	This level of visitation would
<b>Curry Village and Campgrounds</b>		
Stoneman Meadow and Curry Orchard parking lot	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	Change would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective. The ORV would be protected segmentwide.
Curry Village Lodging	Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.	Mitigation measures would contribute to documentation and interpretation of historic cultural resources during facility removal. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective. The ORV would be protected segmentwide.
Huff House Employee Housing	Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	Mitigation measures would contribute to documentation and interpretation of historic cultural resources during facility removal and construction. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective. The ORV would be protected segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would contribute to documentation and interpretation of historic cultural resources during facility removal. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective. The ORV would be protected segmentwide.
Ahwahnee Parking Lot	Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to "good" condition.	Redesign of the Ahwahnee Parking Lot would rehabilitate contributors to the cultural ORV thereby enhancing the Yosemite Valley Historic Resources ORV locally and segmentwide.

Yosemite Village Day-Use Parking Area	Remove Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Re-align the intersection at Northside Drive and Village Drive. Add a three-way intersection at Sentinel Drive and the entrance to the parking area. Provide on-grade pedestrian crossings. Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area and construct a traffic circle at Northside Drive/Village Drive to address traffic congestion and pedestrian/vehicle conflicts.	The removal of historic and non-historic properties and re-alignment/re-establishment of the intersections would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective. The ORV would be protected segmentwide.
Sugar Pine Bridge	Remove bridge and the connecting berm.	The action would remove a contributor to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of this bridge would not result in a segmentwide adverse effect of the collective of resources. The ORV would be protected segmentwide.
Superintendent's House (Residence 1)	Relocate outside the river corridor to the NPS housing area. Rehabilitate historic structure in new location.	The action would remove a contributor to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of this resource would not result in a segmentwide adverse effect of the collective of resources. The ORV would be protected segmentwide.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	The action would affect trails that are connected by the historic footbridges which are components of the Yosemite Valley Historic Resources ORV. Mitigation measures and Section 106 review would ensure the protection of the historic resources and the redesign could result in enhancement of the ORV locally.

To address management considerations, the *Merced River Plan/DEIS* proposes continuing the active program of maintenance for historic buildings and structures; employing existing design guidelines to ensure that new development or redevelopment complements the ORV and the Yosemite Valley Historic District; and periodically assessing and updating professional documentation for the historic resources.

Ecological and scenic value restoration actions in Segment 2 would enhance the cultural landscape which contributes to the historic setting of the resources that comprise the ORV-10. There are no construction actions associated with Alternative 5 that would affect the spatial organization of the historic resource collective, though changes in the circulation patterns as a result of re-routing roads at the Yosemite Village day-use parking area and at Stoneman Meadow would affect circulation patterns that are associated with this ORV. These effects would be localized and would not affect the condition of the ORV on a segmentwide level.

**Conclusion:** Under Alternative 5, the historic resources component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of three bridges and the relocation of the Superintendent's House (Residence 1) would result in localized effects that would be mitigated through documentation and interpretation. Once removed or



relocated, these resources would no longer be considered part of the ORV collective. All disturbances to circulation and spatial organization associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and documentation (as needed) to ensure that historic resources are protected.

### ***Scenic ORV-16 – Iconic Scenic Views in Yosemite Valley***

Visitors to Yosemite Valley experience scenic views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls. Actions intended to manage natural resources may include the use of prescribed fire or controlled burns to thin forests that are encroaching on meadows; cutting trees, tree branches or other vegetation by mechanical means; and the application of herbicides to control invasive species. Related actions intended to protect the Recreation ORV would limit the number of visitors to lessen visitor density and congestion at attraction sites and make improvements to the transportation system that would reduce automobile congestion. Air quality can affect visitors' ability to experience scenic values in Segment 2. The NPS would cooperate with regional authorities to reduce airborne contaminants caused by combustion, including carbon dioxide emissions, smoke caused by fire, particulate matter generated by construction, and to improve air quality conditions.

In consideration of Wild and Scenic River Act requirements that the NPS consider the presence of existing structures, major facilities and services provided for visitor use, the NPS would eliminate several structures and facilities in Segment 2 under this alternative. Under Alternative 5 actions would remove structures at the Ahwahnee pool and tennis court. Removal of these structures could enhance scenic resources from specific locations. Ecological restoration actions in Segment 2 would enhance the meadow and riparian communities which contribute to the scenic values in Yosemite Valley. This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Facilities that would remain in this segment of the river have no direct impact on the scenic river value as indicated in the baseline condition assessment. Changes to parking and vehicle traffic in Yosemite Valley to enhance Recreational ORV- 20 particularly the removal of roadside parking along Sentinel Drive and restoration to natural conditions would enhance Scenic ORV-16.

**Conclusion.** Under Alternative 5, the scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Tree thinning and ecological restoration actions would improve natural scenic conditions. Removal of buildings at Housekeeping Camp, the Concessioner Garage, the Concessioner General Offices, and the Concessioner Stables would reduce intrusions on scenic resources. All parking lot and campground construction under this alternative would be subject to park standard operating procedures and subject matter expert review to ensure that scenic resources are protected.

**TABLE 8-113: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR SCENIC ORV-16**

Location	Action in Alternative 5	Effects to ORV-16
<b>Segmentwide</b>		
Selected Scenic Vista Points	Selectively thin conifers and other trees and shrubs that encroach on selected scenic vista points. Remove unnecessary facilities and ensure that all future development satisfies objectives that provide low contrast ratings.	Changes would enhance the scenic values on a segmentwide level.
<b>Curry Village and Campgrounds</b>		
Yosemite Valley Campgrounds	All campsites within 150 feet of the river removed. New campsites installed at Upper Pines, Backpacker's, Eagle Creek, Camp 4, West of Lodge, and Upper River Campgrounds	Changes to campgrounds would not interfere with iconic scenery. Removal of campgrounds near the river will enhance viewsheds segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day-Use Parking Area/Village Center Parking Area	The Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 750 parking places.	Removal of buildings would enhance viewsheds locally.
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 lodging units out of the observed ordinary high water mark.	Removal of Housekeeping units near the river will enhance viewsheds locally.
Yosemite Village Concessioner Employee Housing	Temporary housing at Huff House and Boys Town is removed. Remove housing units (7 buildings, 64 beds) in rock fall hazard zone. Construct 16 buildings, housing 164 employees using the same dormitory prototype. Temporary housing at Lost Arrow is removed, replaced with 50 bed permanent housing facility.	Facilities are out of major viewsheds and changes would not interfere with iconic scenery.

### ***Recreational ORV-20 – River-related Recreation in Yosemite Valley***

Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River. Throughout the Yosemite Valley segment, the river has provided the setting for recreational experiences such as fishing, floating, and sightseeing. Transportation is considered an important part of the visitor experience in Yosemite Valley because it is the means of access to recreational opportunities in Yosemite Valley. Management considerations address the amount of vehicle traffic and the number of people at one time in Yosemite Valley at the peak times of day during the park's busy summer season.

**TABLE 8-114: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR RECREATIONAL ORV-20**

Location	Action in Alternative 5	Effects to ORV-20
Segmentwide visitation	19,900 visitors per day	This managed change in visitation would reduce crowding and congestion thereby enhancing the recreation ORV on a segmentwide level.
<b>Curry Village and Campgrounds</b>		
Concessioner Stables	Retain Concessioner Stables to support Merced Lake High Sierra Camp and overflow parking for campgrounds. Commercial equestrian day rides would be eliminated. Kennel service remains. Retain associated housing (25 beds).	Actions result in little change from current conditions and would not substantially alter components of the river recreation experience. The ORV would continue to be protected segmentwide.
Curry Village Lodging	Lodging would include 453 units, as compared with 400 under Alternative 1.	Changes to Lodge would be in keeping with current facility. Lodge itself is not part of the ORV-20 but does facilitate access to ORV-20 for certain visitors. This use would remain. The ORV would continue to be protected segmentwide.
Lower Rivers Nature Walk	Create an interpretive (nature) walk through Lower River that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	Change would improve interpretation of the river and its values. The ORV would continue to be protected locally.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts	Removal of facilities would reduce opportunities for one type of recreation activities, but would not substantially alter components of the river recreation experience. The ORV would continue to be protected segmentwide.
Segment wide River Access	Swimming and water play allowed. No commercial boating. Private use limited to 100 trips per day in Segment 2 between put in at Lower River Day Use Area and take out at Sentinel Beach.	Change would limit commercial boating and would limit the number of private boating. However, this change does not affect components of the recreational ORV. This reduction in boats enhances dispersed recreation along the river corridor thereby enhancing the ORV segmentwide.
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 units out of observed ordinary high water mark. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.	Changes similar to current conditions and would not substantially alter components of the river recreation experience. The ORV would continue to be protected segmentwide.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	Change would bring about localized improvements in circulation and wayfinding thus enhance ORV-20 locally.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Visitor Facilities	Retain 245 existing rooms	Changes similar to current conditions and would not substantially alter components of the river recreation experience. The ORV would continue to be protected segmentwide.

**TABLE 8-114: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR RECREATIONAL ORV-20 (CONTINUED)**

Location	Action in Alternative 5	Effects to ORV-20
<b>Yosemite Lodge and Camp 4 (cont.)</b>		
Yellow Pine and Camp 4 Campgrounds	Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Retain 4 group administrative use sites (up to 120 people).	Increased access to camping as recreational experience would not substantially alter components of the river recreation experience. The ORV would continue to be protected segmentwide.
East Valley Day-Use Parking	Reduction in available day-use parking, and implementation of an East Yosemite Valley Day-use Parking Permit system	This will result in a segmentwide enhancement of the recreational experience in segment 2 by reducing crowding at key attraction sites as well as access to these areas (along roadways, in parking lots, etc).

All restoration actions to protect and enhance biological, cultural, geologic/hydrologic, and scenic ORVs would further enhance visitors' connections to the river and its values, which are essential to the recreational ORV in this segment. These actions would ensure that the changes in day-use, camping, and lodging opportunities would not cause adverse effects or degradation to ORV-20 on a segmentwide basis. Camping and overnight lodging would be available segmentwide, and essential aspects of the recreational ORV would not be affected. There are also actions proposed in Alternative 5 that would improve picnicking, and wayfinding. Finally, commercial boating is eliminated and private boating is limited to 100 trips per day in Segment 2, in this alternative which reduces crowding and increases the stretches of the river on which private boating and paddling is allowed, thereby enhancing key aspects of this recreational experience.

Chapter 6 provides a more detailed description of the day-visitor capacity management strategies that directly measure aspects of the Recreation ORV and outlines specific actions. These actions include:

- Utilize parking and traffic management staff to improve parking efficiency and traffic flow in Yosemite Valley and other locations where needed.
- Institute a transportation fee at entrance stations (for peak-use season).
- Divert vehicles to other destinations outside of Yosemite Valley when parking in the Valley fills.
- When all parking fills to capacity, day visitors would be diverted at checkpoints throughout the park and at entrance stations.
- East Valley day-use parking permits would be issued by advanced reservation and on a first-come-first-serve basis.

NPS would use the Highway Capacity Manual Pedestrian Level of Service (discussed further in Chapter 5) for evaluating the capacity and quality of service of transportation facilities, including walkways, multi-use paths, and similar pedestrian facilities. NPS would also monitor parking rates and vehicles at one time to ensure that they are not exceeding the management standard. Should specific trigger points be reached, the NPS would implement a series of specific actions to improve parking to an acceptable level. Similarly, should visitor densities begin to approach specific triggers; NPS would take steps to keep such densities within the management standard.

**Conclusion.** Under Alternative 5, the recreation ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season will significantly reduce crowding thereby enhancing the recreational ORV. All restoration actions would enhance opportunities to connect with the river and its values. The reduction in commercial services would affect opportunities for particular types of recreational activities, but would not affect the essential components of the recreation ORV on a segmentwide basis.

### **Segment 3 – The Merced Gorge (Scenic Segment)**

#### ***Scenic ORV-17 – Scenic View in the Merced River Gorge***

The Merced River drops 2,000 feet over 14 miles; a continuous cascade under spectacular Sierra granite outcrops and domes. There are no existing management considerations with respect to the Scenic ORV in the Merced River Gorge. Although there are some localized visual intrusions from essential facilities such as visitor parking areas, restrooms, the Arch Rock entrance station and the El Portal Road, these facilities are consistent with the scenic classification of this river segment. As explained in Chapter 5, this ORV is currently protected and enhanced.

This alternative does not propose any new development or landscape changes within the river corridor aside from improvements to existing roadside pullouts and drainage. These changes would not degrade or adversely impact the scenic ORV on a segmentwide basis. Although private vehicles and overall visitation during peak periods will be managed for East Yosemite Valley only, it is probable that visitation and visitors at one time in Segment 3 will also witness a reduction under this alternative. This reduction in visitation and visitors at one time may reduce vehicles per viewshed, thereby enhancing the scenic ORV. Monitoring associated with this ORV would ensure that the attributes that comprise this ORV remain within the accepted management class rating.

Alternative 5 would accommodate the same kinds and amounts of use that exist today in Segment 3. The types and levels of use in Segment 3 under this alternative would remain largely unchanged. Actions considered under Alternative 5 would cause no adverse effects or degradation to ORVs on a segmentwide basis.

**Conclusion.** Under Alternative 5, this scenic river segment would show little evidence of human activity and remain largely free of structures. The scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season in Yosemite Valley will significantly reduce the number of vehicles per viewshed in this segment. All restoration actions would further enhance scenic characteristics in this segment.

## Segment 4 – El Portal (Recreational Segment)

### *Geological/Hydrological ORV-7 – The Boulder Bar in El Portal*

Natural processes would continue to shape the landscape and the geologic ORV. The NPS has not identified any management considerations with respect to the El Portal boulder bar. Land use and facility actions proposed in this alternative would not affect this ORV. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection are necessary. Moreover, the types and levels of visitor and administrative use (e.g., housing, maintenance operations, office space, passive recreation) allowed under this alternative would not affect this ORV. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

**Conclusion.** Under Alternative 5, the geologic values of this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no actions that would affect the boulder bar in El Portal, and there are no ongoing concerns or considerations associated with this resource.

### *Cultural ORV-11 – The El Portal Archeological District*

The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region. Four sites are known to have experienced particularly severe damage, most notably a large ancient village and cemetery.

To address management considerations pertinent to this river value, the NPS would undertake the following actions:

- Protective measures would ensure that exceptional sites would be protected from unmitigated effects that could lead to adverse effects or degradation on a segmentwide level. A plan of action for addressing the abandoned infrastructure on sites would be developed in consultation with traditionally-associated American Indian tribes and groups. Any solution(s) developed would also include a recommended approach for deterring visitor use within the sites.
- Informal trails, non-essential roads, and abandoned infrastructure would be removed to protect and enhance the archeological resources contributing to the ORV in Segment 4.
- Remove informal trails and non-essential roads.

There are no existing instances of adverse effect or degradation to this ORV. As discussed above, management considerations are present associated with abandoned infrastructure that remains on an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians. Management considerations are also associated with non-essential roads and trails that impact archeological sites. In recognition of the high cultural significance of these sites, this alternative requires the park to develop plans to remove abandoned infrastructure and non-essential roads. Restoration actions to establish a 2.5 acre recruitment area for Valley Oaks would further protect adjacent archeological resources. Construction of employee housing in Old El Portal, Abbieville, and Rancheria would be designed to avoid or mitigate threats and



**TABLE 8-115: SEGMENT 4 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-11**

Facility	Action in Alternative 5	Effects to ORV-11
<b>El Portal</b>		
Abbieville, Old El Portal, and Rancheria Flat Concessioner Employee Housing	New concessioner employee housing in Old El Portal (12 beds) and Rancheria Flat (94 beds). Remove or relocate 36 existing private residences at Abbieville out of the 150-foot riparian buffer.	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Abbieville Trailer Park Area	Develop El Portal Remote Visitor Parking Area in the Abbieville/Trailer Park area to provide 200 spaces of visitor parking serviced by regional transit. Adjacent to cultural resources, however only suitable location proximate with direct access to Highway 140.	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Mitigation measures would protect cultural resources during facility removal and ecological restoration. Change would continue to protect archeological resources locally.

disturbances to archeological sites. Monitoring and protective measures would ensure that new use patterns associated with the new housing would not affect contributing elements of the El Portal Archeological District.

**Conclusion:** Under Alternative 5, the archeological resources in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of abandoned infrastructure, informal trails and non-essential gravel roads would enhance protection of archeological resources. Valley Oak restoration actions would protect adjacent archeological resources from further ground disturbance, Construction of new employee housing would be designed to avoid or mitigate effects to the El Portal Archeological District. New or altered visitor use patterns associated with the new housing development would be monitored and protective actions would occur if effects triggered responses.

## **Segment 5 – South Fork Merced River Above Wawona (Wild Segment)**

### ***Biological ORV-1 – High-elevation Meadows and Riparian Habitat***

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Restoration actions to remove informal trails and charcoal rings to protect cultural resources proposed under this alternative would not affect high-elevation meadows. The NPS proposes no major facility or visitor use actions for Segment 5 under Alternative 5. The biological ORV in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level.

### ***Cultural ORV-12 – Regionally rare archeological features representing indigenous settlement including archeological sites with rock ring features***

Three regionally rare prehistoric archeological sites are located along this segment of the South Fork of the Merced Wild and Scenic River corridor. The sites contain unique stacked rock ring constructions and rock alignments. Two sites also contain pine timber remains within the ring interiors or incorporated into the

stacked rock courses. Rock constructions are considered fragile and highly subject to human alteration from camping and campfire building disturbances. Two of the South Fork sites are adjacent to formal NPS trails, increasing the likelihood of disturbance. The vicinity of the sites has not been systematically surveyed, and it is possible that additional rock ring sites may be present along the South Fork. Should additional rock ring sites be discovered in the monitoring process, they would also become a part of the South Fork ORV. To remedy these considerations, NPS would:

- Complete documentation of the features. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker). Remove informal trails and charcoal rings.
- Increase education and outreach to Wilderness travelers.

**Conclusion:** Under Alternative 2, the archeological resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no specific actions to manage user capacity, land use, and/or facilities under Alternative 5 within Segment 5 beyond those designed to protect and enhance ORV-12 that would impact components of Cultural ORV-12. Monitoring activities described in Chapters 5 and 8 would continue to protect and enhance Cultural ORV-12 to ensure there are no adverse effects or degradation to ORV-12 on a segmentwide basis.

### ***Scenic ORV 18 – Scenic Wilderness Views along the South Fork Merced River***

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

**Conclusion.** Under Alternative 5, the scenic resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. The scenic ORV for Segment 5 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## **Segment 7 – Wawona (Recreational Segment)**

### ***Biological ORV-3 – The Sierra sweet bay (*Myrica hartwegii*)***

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV would be determined by comparing populations located near Wawona Campground (an area that is likely to be disturbed by humans) with more remote populations that are less likely to receive such disturbance. This population of Sierra sweet bay is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

To ensure that this biological ORV is protected and enhanced through time, the NPS would monitor the condition of the Sierra sweet bay population to ensure early warning of conditions that require management action before impacts occur.

**Conclusion.** Under Alternative 5, the Sierra Sweet Bay in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Reduction in camping and visitor activity in the vicinity of Wawona Campground would enhance this resource.

**TABLE 8-116: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR BIOLOGICAL ORV-3**

Facility	Action in Alternative 5	Effects to ORV-3
<b>Wawona</b>		
Wawona Campground	Retains 72 sites and one group site. Remove 27 sites that are either within the 100-year floodplain or in culturally sensitive areas.	Action would improve the condition of the ORV by reducing the potential effects on this species associated with campground visitation. The ORV would be protected locally.

### *Cultural ORV-13 – Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This district spans segments 5, 6, 7, and 8. Accordingly, the condition of this historic property is assessed at the property-level, rather than the segmentwide level. Segment 7 includes the remains of the U.S. Army Cavalry Camp A. E. Wood documenting the unique Yosemite legacy of the African-American buffalo soldiers and the strategic placement of their camp near the Merced River. There are several management considerations for this ORV: the Wawona Archeological District is subject to site-specific impacts from park operations, visitor use, artifact collection, vandalism, and ecological processes. The following actions would help to address these issues:

- Increase monitoring frequency at affected sites.
- At the district-wide level, revise the existing National Register nomination to reflect changes since its original writing, for example, incorporating newly discovered resources and documenting impacts.
- The Wawona Campground capacity would be reduced to 67 sites (including one group site). 32 sites are removed because they are either within the 100-year floodplain or in culturally sensitive areas.
- Remove informal trails and fire rings to prevent continuing disturbance.
- Develop site management plans as needed for sites with complex uses. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds
- Consider need for archeological site treatment measures to address impacts to shallow deposits of artifacts and features.

The NPS would delineate trails, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; conduct public education to discourage disturbance to sensitive features. To

prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

**TABLE 8-117: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-13**

Facility and Land Use	Action in Alternative 5	Effects to ORV-13
<b>Wawona</b>		
Wawona Campground Septic System	Remove septic system, and connect to the sewer system. Build a lift station above the campground to connect to the existing water treatment plant.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Wawona RV dump site	Relocate the dump site to an appropriate location away from the river.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Wawona Store	Replace the existing public restroom facilities with larger restrooms to accommodate visitor use levels. Improve picnic area, redesign bus stop.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Wawona Swinging Bridge	Provide access to Swinging Bridge with access on the south side of the river, delineate trail, restrooms, waste disposal and parking.	Mitigation measures would (as applicable) include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Restrooms and waste disposal will reduce threats and disturbances to adjacent archeological resources. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.

### ***Cultural ORV-14 – Wawona Historic Resources***

The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity. The Wawona Covered Bridge is in good condition, and there are no current management considerations associated with it, however the bridge requires maintenance to keep the historic structure in good condition in the face of adverse weather and visitor use.

The Wawona Hotel complex continues to serve its original purpose as a guest lodging facility. Management considerations related to the hotel complex involve concessioner operations, the need for regular and routine preservation maintenance, and periodic rehabilitation to ensure visitor safety.

- Regular and routine preservation maintenance, conducted in accordance with the Secretary of the Interior's Standards, would ensure that this upkeep protects the historic character of the buildings
- Periodic rehabilitation would involve subject-matter specialists in planning, design and implementation to ensure actions do not compromise the historical integrity of the complex

- Concessioner operations would ensure that any operational modifications or updates are appropriate and in keeping with the historic character of the complex.

To prevent future impacts, the NPS would monitor the condition of the bridge, and take specific actions should conditions exceed trigger points. Trigger points are selected to inform managers well in advance of adverse effects or degradation on the Wawona Covered Bridge. Management considerations for the Wawona Hotel complex include the need for regular and routine preservation maintenance, periodic rehabilitation, and ongoing operations that serve its continuing function as a historic lodging facility. To address these management considerations, the NPS would ensure that these activities would conform to the Secretary of the Interior's Standards for Treatment of Historic Properties.

**TABLE 8-118: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR WAWONA HISTORIC RESOURCES ORV-14**

Facility	Action in Alternative 5	Effects to ORV-14
<b>Wawona</b>		
Wawona Hotel	Retain 104 lodging units at the Wawona Hotel. Retain hotel restaurant, swimming pool and tennis court. Retain golf course and golf shop.	The action would retain contributors to the Wawona Historic Resource. The ORV would continue to be protected locally.

## Segment 8 – South Fork Merced River below Wawona (Wild Segment)

### *Biological ORV-3 — The Sierra sweet bay (*Myrica hartwegii*)*

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV in Segment 8 is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

### *Cultural ORV 13— Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This ORV in Segment 8 is in good condition, with no management considerations present. Management actions are not required at this time.

### *Scenic ORV-18 – Scenic Wilderness Views along the South Fork Merced River*

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

The scenic ORV for Segment 8 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## **ALTERNATIVE 6**

### **River Value – Free-flowing Condition in All Segments**

A free-flowing river, or section of a river, moves in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis. Riprap revetment, abandoned infrastructure within the bed and banks of the river, and bridges that constrict the flow of the river may produce localized effects on free-flowing condition of the river. Alternatives 2-6 would enact a comprehensive suite of actions to enhance the free-flowing condition of the river by removing 3,400 linear feet of riprap, and removing abandoned and unnecessary infrastructure from the river channel and its floodplain. Infrastructure that would be removed includes former sewage treatment facilities, sewer and water lines, and former bridge abutments. In addition, Alternative 6 would remove 348 linear feet of riprap from riverbank areas, beyond that proposed for removal under Alternatives 2-6.

All three historic bridges, the Stoneman, the Sugar Pine and the Ahwahnee, would remain in place under Alternative 6. The existing hydrological effects of these bridges would be mitigated with strategic placement of large wood on riverbanks, constructed log jams in the river channel, and the use of brush layering techniques to establish riverside vegetation and decrease erosion.

There are no new facilities proposed under Alternative 6 that would affect the free-flowing condition of the river. A number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/Geological ORVs). For example, the Yosemite Village Day-use Parking Area would be relocated north 150 feet away from the river.

To protect the river's free flowing condition in the future, the NPS would require all proposed projects involving construction within the bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSRA. Through this process, the NPS would ensure that water resources projects within the designated river corridor would not lead to "direct or adverse effects" on free flow, and that projects on tributaries to the river do not "invade or unreasonably diminish" the river's free flowing condition.

**Conclusion:** The current free-flowing condition of the Merced River is fully protected and enhanced on a segmentwide basis, although localized considerations such as intermittent riverbank and bridges that constrict the flow of the river are present. Alternative 6 proposes a comprehensive suite of actions to enhance the free-flowing condition of the river by removing riprap and unnecessary infrastructure in the river channel. The existing hydrological effects of bridges that constrict the flow of the river would be mitigated with techniques to establish riverside vegetation and decrease erosion. There are no new facilities proposed under Alternative 6 that would affect the free-flowing condition of the river within the river channel, and a number of proposed facility actions would enhance the connectivity of the river and its floodplain (see Hydrological/ Geological ORVs). The NPS would require all proposed projects within the



bed or banks of the Merced River or its tributaries to undergo an analysis in accordance with Section 7 of the WSRA to ensure that water resources projects would not lead to “direct or adverse effects” on free flow, and that projects on tributaries to the river do not “invade or unreasonably diminish” the river’s free flowing condition. The actions proposed under Alternative 6 ensure that there are no direct or adverse effects on free-flowing condition of the Merced River.

### **River Value – Water Quality in All Segments**

The water quality of the Merced River is extremely high, and the current water quality of the river is fully protected and enhanced on a segmentwide basis. Intermittent local instances of contamination may occur in connection with surface water runoff from parking areas, recreational vehicle dump stations in proximity to the river, and accelerated erosion with potential sediment loading in the river during high water flows. Alternatives 2-6 would apply mitigation measures to ensure that surface water runoff associated with parking areas protects the water quality of the Merced River and meets regulations. The Upper Pines and Wawona recreational vehicle dump stations would be moved away from the river, and the Odger’s bulk fuel storage area in El Portal would be moved out of the 500-year floodplain. In addition, Alternative 6 would relocate the Yosemite Village Day-use Parking Area 150-feet away from the river. All campsites and infrastructure currently within 100-feet of the river would be removed. The pack trail from Curry Village stables to Happy Isles would be re-routed farther away from the river. These actions would reduce result in less erosion along the riverbank, reduce use in sensitive areas, direct use to resilient areas, and mitigate potential sources of pollutants.

Ecological restoration actions would take place along the riverbank and floodplain of the Merced River. These actions would enhance water quality, particularly the actions that re-establish riverbank vegetation and reduce erosion potential. Ecological restoration actions are described in more detail in the discussion of the biological ORVs below and in Appendix E.

There are no new facilities proposed under Alternative 6 that would affect the water quality of the river. In areas of new development or high-density use, sensitive riverbanks would be fenced to

**TABLE 8-119: CORRIDOR-WIDE ACTIONS AND THEIR IMPLICATIONS FOR WATER QUALITY**

Location	Action in Alternative 6	Effects to Water Quality
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within 100 feet of the river would be removed. Designated put in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged. Water quality would be enhanced segmentwide.
New campsites at Upper Pines, Backpackers, Camp 4, Eagle Creek and Upper and Lower River Campgrounds	New campsites constructed at Upper Pines, Upper River, Lower River, Backpackers, Eagle Creek, West of Lodge and Camp 4 out of the 150 foot riparian buffer.  Lower River: Designate river access at Housekeeping Camp eastern beach.	New campsites would be located 150 feet away from the river to protect riparian areas from direct impacts related to the increase in visitor activity in these areas. Fencing and designated river access points would also direct use to resilient areas. Change would not result in result in additional water quality effects on a segmentwide level.
Stock Trail from Concessioner Stables to Happy Isles	Remove 3,800' of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material. Also, in addition to common to all, re-route stock use north along the road where they meet up on the Valley Loop Trail.	Change would result in less erosion from the stock trail and stock use. Water quality continue to be protected locally.
Curry Orchard Day-Use Parking Area:	Provide 430 parking spaces through a re-design of the parking lot.	Engineering solutions included to promote water flow and increase drainage to Stoneman Meadow. Change would not result in result in additional water quality effects on a segmentwide level.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area	Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places.	Fencing and designated river access points would also direct use to resilient areas. Change would result in less erosion and storm water run-off from the parking area; water quality would continue to be protected locally.
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 units out of river bed and banks. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.	Fencing and designated river access points would also direct use to resilient areas. Water quality would continue to be protected locally.
Concessioner Employee Housing	Create 50-foot setback from Indian Creek – ecologically restore the riparian habitat and protect by restoration fencing.	These changes would result in less erosion along the riverbank by reducing activities in this setback. Sensitive areas would be restored and protected by fencing.
<b>Segment 4</b>		
NPS Maintenance and Administrative Complex	Existing parking area formalized and paved using best management practices.	Change would result in less erosion and storm water concerns in the parking area; water quality would continue to be protected locally.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Removal of bulk fuel storage from the 500-year floodplain would further protect water quality segmentwide.

**TABLE 8-119: CORRIDOR-WIDE ACTIONS AND THEIR IMPLICATIONS FOR WATER QUALITY (CONTINUED)**

Location	Action in Alternative 6	Effects to Water Quality
<b>Segment 7</b>		
Wawona Campground	Replace current septic system with waste water collection system connected to the waste water treatment plant. RV dump site relocated away from the river.	Change would result in less potential for storm water concerns in the campground; water quality would be enhanced locally.
Wawona Picnicking	Delineate boundaries of two formal picnic areas with formal river access points.	Change would result in less erosion along; water quality would be enhanced locally.

eliminate trampling. Trampling can lead to vegetation loss and exposed soil, leading to accelerated sediment deposition in the river. To maintain excellent water quality, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

**Conclusion.** Under Alternative 6, water quality in all segments of the Merced River corridor would continue to be absent of adverse effects and degradation, and the potential for localized instances of contamination would be strongly reduced. Alternative 5 would address localized issues by moving the Upper Pines and Wawona recreational vehicle dump stations away from the river, moving the Odger's bulk fuel storage area outside of the 500-yr floodplain, and applying mitigation measures to ensure surface water runoff associated with parking areas meets requirements. Ecological restoration actions would decrease the potential for accelerated riverbank erosion and sediment loading during high water events. To ensure that existing high water quality conditions are maintained, the NPS would monitor water quality indicators that are tied to human activity (e.g., nutrient levels), and take specific actions should specific trigger points be reached.

## **Segment 1 – Merced River Above Nevada Fall (Wild Segment)**

### ***Biological ORV 1 – High-elevation Meadows and Riparian Habitat***

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Primary actions to protect and improve Biological ORV 1 include removal of informal trails that incise meadow habitat, trails in wet and/or sensitive vegetation, and trails that fragment meadow habitat, including trails in the Triple Peak Fork meadow, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and other areas as necessary. Removal of social trails that bisect the meadows would improve conditions in this segment because soil compactions and habitat fragmentation would be reduced. Preliminary grazing capacities would be established, monitored, and adapted as necessary which would also reduce soil compaction and habitat fragmentation, thus further enhancing meadow health. Under this alternative the High Sierra Camp would remain at its current capacity of 60 people per night.

As described in Chapter 5, to ensure this ORV is protected and enhanced through time, the NPS would monitor three indicators to assess the condition of the ORV: meadow bare soil, meadow fragmentation due to the proliferation of informal trails, and streambank stability. The NPS would establish a baseline for all three indicators using site-specific monitoring protocols by 2013. Regular

**TABLE 8-120: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-1**

Location	Action in Alternative 6	Effects to ORV-1
Meadow Trails	Remove informal trails that incise meadow habitat.	Change reduces effects to wet and sensitive meadows and results in localized enhancement to ORV-1.
Merced Lake High Sierra Camp	Retain the Merced Lake High Sierra Camp, keeping 22 units (60 beds). Replace the flush toilets with composting toilet.	Facility is not directly adjacent to meadows. Changes would not affect high-elevation meadow and riparian habitat, this ORV would continue to be protected locally.
Private boating would be allowed in this segment	Boating would consist of short floats using pack raft or other craft that can easily be carried. Put-ins and take-outs would be undesignated and dispersed. Ten boats per day allowed - permit would be required.	Limited numbers would protect riparian habitat from trampling and bank erosion that could result with unlimited access. Changes would not affect high-elevation meadow and riparian habitat, this ORV would continue to be protected on a segmentwide level.
Wilderness zone capacity	All zone capacities within the Merced WSR Corridor remain the same as currently managed.	Current zone capacities are designed to protect wilderness character including natural conditions such as riverbanks and meadows. Action would not affect high-elevation meadow and riparian habitat, this ORV would continue to be protected on a segment –wide level.

monitoring would also reveal whether assumptions about human behaviors and actions taken to correct past actions are sustaining conditions above the management standard. If conditions have reached trigger points; the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects. The meadow monitoring programs for the biological ORV would monitor meadow fragmentation to ensure that use levels from hikers, backpackers and stock users do not result in meadow fragmentation or bare ground in excess of the management standards prescribed to protect and enhance meadows.

**Conclusion.** Under Alternative 6, the biological ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance riverbanks and meadows. Removal of social trails, grazing in Merced Lake East Meadow, and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures. **Facilities that would remain** in this segment of the river include Merced Lake High Sierra Camp, Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the Biological ORV in this segment indicates that these facilities are not adversely affecting the Biological ORV.

### ***Geological/Hydrological ORV-4 – Glacially-carved Canyon in the Upper Merced River Canyon***

As discussed in Chapter 5, there are no management considerations with respect to the U-shaped, glacially carved canyon above Nevada Fall. This ORV is currently protected and enhanced within the meaning of the Wild and Scenic Rivers Act. Alternative 3 does not propose any actions that would change the condition of this ORV over time. Further, the U-shaped, glacially carved attributes of this ORV would not be affected by

the types and levels of use authorized under this alternative, which are all directed toward wilderness oriented recreation. The NPS would nevertheless monitor the condition of this ORV to ensure that its condition does not decline.

### ***Scenic ORV-15 – Scenic Views in Wilderness***

Visitors to this Wilderness segment experience scenic views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks. Management considerations associated with the condition of the scenic river above Nevada Fall include contributions to regional air pollution, visual intrusions, temporary and permanent structures, and crowding in and near wilderness campgrounds. There are few “visual intrusions” noted beyond the High Sierra Camp and other designated camping areas. The NPS would ensure that Merced Lake High Sierra Camp and other designated camping areas are maintained in a clean and tidy condition. Under Alternative 6, High Sierra Camp tent fabric would be replaced with colors that blend within the landscape, such as gray, brown or green, so as to reduce contrast (the tents are currently white canvas). These changes, as well as any other structures proposed at the camp or elsewhere in Segment 1, would be expected to blend quite well with the native landscape.

The ORV is determined to be in the protected state, as defined by an absence of adverse effects and degradation, although intermittent air quality concerns are present. Because of the ambient nature of air quality, it cannot be managed exclusively for the river corridor. Facilities that would remain in this segment of the river include Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. The baseline condition assessment for the scenic ORV in this segment indicates that these facilities are not adversely affecting the scenic ORV.

**TABLE 8-121: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR SCENIC ORV-15**

Location	Action in Alternative 6	Effects to ORV-15
Merced Lake High Sierra Camp	Retain the Merced Lake High Sierra Camp, at current capacity (60 beds). Replace tent fabric with colors that blend within the landscape.	Change would enhance the ORV locally.
Designated Camping Areas	Retain the Merced Lake Backpackers, Little Yosemite Valley, and Moraine Dome designated camping areas.	Designated camping areas within the segment are currently protective of river values on a segmentwide level.
Facilities retained	Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp	These facilities and associated administrative uses and maintenance do not affect scenic values on a segmentwide level. The ORV would continue to be protected segmentwide.

**Conclusion.** Under Alternative 6, the scenic ORV in Segment 1 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would further enhance scenic values in this segment. Replacement of the Merced Lake High Sierra Camp tent fabric would address scenic considerations in this segment, which focus on the High Sierra Camp and thereby enhance the scenic ORV. The wild segment of the Merced River corridor above Nevada Fall would show little evidence of human activity and remain largely free of structures.

### ***Recreational ORV-19 – Wilderness Recreation above Nevada Fall***

Visitors to federally designated Wilderness in Segment 1 would engage in a variety of river related activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the Wilderness experience. The current condition of this ORV is at or above the management standard at the segment level. Localized management concerns in this segment relate to crowding at Little Yosemite Valley and Moraine Dome backpackers campgrounds, high use levels at the Merced Lake Backpackers Camping Area, and high encounter rates along the trails that connect these areas. Crowding and high use levels affect the Wilderness experience, which is an integral part of the recreational ORV in this segment.

This alternative would retain the High Sierra Camp at current levels. The capacity of the Little Yosemite Valley Wilderness Zone would be remain at 150. Actions in Alternative 6 would apply additional seasonal and weekend restrictions for commercial groups in the Mount Lyell, Merced Lake, and Little Yosemite Valley zones as indicated. These changes would reduce use levels and result in some decreased use in the immediate vicinity of these camping areas. These changes would reduce use crowding, high use levels, and increase opportunities for solitude in this Wilderness segment.

Facilities that would remain in this segment of the river include designated camping areas in Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers Camping Area (including associated trails and footbridges) and the Merced Lake Ranger Station, Little Yosemite Valley trail crew and ranger camp, trails and footbridges. These facilities do not have an adverse effect on the Wilderness experience integral to this Recreational ORV.

NPS would monitor visitor encounter rates to ensure that they are not exceeding established standards. Should specific trigger points be reached, the NPS would be required to implement a series of specific actions to reduce visitor levels to an acceptable level. These actions increase in severity as the current condition ORV condition moves away from the management standard to ensure proper course correction and re-establishment of the management standard. These trigger points were selected to inform managers in advance of any adverse effects or degradation to this ORV.

**Conclusion:** Under Alternative 6, actions would not substantively change existing wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.



**TABLE 8-122: SEGMENT 1 ACTIONS AND IMPLICATIONS FOR RECREATION ORV-19**

Location	Action in Alternative 6	Effects to ORV-19
<b>Location</b>		
Merced Lake High Sierra Camp	Retain the Merced Lake High Sierra Camp, at current capacity (60 beds). Replace the flush toilets with composting toilet.	The actions would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.
Merced Lake and Little Yosemite Valley Backpackers Camping Areas	Concentrate visitor use at Little Yosemite Valley and Merced Lake by retaining designated camping areas in these zones.	The actions would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.
Segmentwide River Access	Swimming and water play allowed. Permits required for private boating. No commercial boating	Permitted use would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.
<b>Visitor Use Management Action</b>		
Private boating would be allowed in this segment	Boating would consist of short floats using pack raft or other craft that can easily be carried. Put-ins and take-outs would be undesignated and dispersed. Private use limited to 10 boats per day with backcountry permit on Segment 1. Permit would be required.	Permitted use would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.
Wilderness zone capacity	All zone capacities within the Merced WSR Corridor remain the same as currently managed.	The actions would not substantively change wilderness character or wilderness experience in this segment; the recreation ORV would continue to be protected on a segmentwide level.

## Segment 2 – Yosemite Valley (Recreational and Scenic Segments)

### *Biological ORV-2 – Mid-elevation Meadows and Riparian Habitat*

The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow-riparian complexes in the Sierra Nevada. Actions to protect and enhance Biological ORV-2 under Alternative 6 include:

- Removal of informal trails in meadows where they fragment meadow habitat or cross through sensitive, wet vegetation communities. Overall, restore six miles of informal trails throughout Yosemite Valley;
- Use boardwalks or hardened surfaces to allow access to sensitive areas;
- Delineation of trails through upland areas and along meadow perimeters;
- De-compacting trampled soils and consolidate multiple parallel trails;
- Re-directing visitor use to more stable and resilient river access points such as sandbars, and designate formal river access sites. Establishing fencing and signage to protect sensitive areas; install boardwalks where appropriate, and actively revegetate where needed;

- Relocate or remove all campsites at least 100 feet away from the ordinary high-water mark;
- Restoration of the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest at specific locations in Yosemite Valley. Management actions could include re-vegetation, prescribed fire, mechanical removal of conifers, and infrastructure re-design. Alternative 6 would include 170 acres ecological restoration.
- Installation of constructed log jams in the river channel between Clark’s Bridge and Sentinel Bridge to remediate river widening and improve channel complexity would also contribute to improving riparian health.
- Day use parking capacity is expanded and formalized. A total of 2,598 visitor parking spaces would be provided in the Valley accommodating a maximum of 7,941 people at one time to Segment 2. Managing access and other proactive restoration measures would protect Biological ORVs by during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Biological ORVs by removing these uses from the river corridor and managing access in the corridor.

This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Under this alternative, all roads, buildings, campgrounds, trails, utilities and infrastructure, and other facilities in this segment with current local effects on the biological ORV would be removed, reduced, or relocated. Facilities that would remain in this segment of the river, including the Ahwahnee Hotel and Yosemite Lodge have no direct impact on the biological river value as indicated in the baseline condition assessment. Effects to the free-flowing condition of the river as a result of the bridges that would remain under this alternative would be mitigated through constructed log jams. Some associated facilities are proposed for relocation as described below.

The NPS would monitor three indicators to assess the condition of ORV 2: meadow fragmentation resulting from informal trails, the status of riparian habitat, and riparian bird abundance. As described in Chapter 5, adverse effects and degradation are not present in relation to the meadow fragmentation indicator. Management concerns in meadows are present; however, actions to address informal trailing impacts and fragmentation would be taken at all meadows where these concerns have been documented. Initial surveys of the riparian status indicator in 2010 indicate that degradation is not present, but management concerns are also present in the riparian corridor.

The NPS is beginning to monitor the third indicator in this segment, riparian bird abundance. The first status assessments would take place in 2013, after one year of monitoring. The next assessment requires information from two out of three years.

**TABLE 8-123: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2**

Location	Action in Alternative 6	Effects to ORV-2
<b>Segmentwide</b>		
Segmentwide Restoration	(Common to all) Restoration includes restoration of meadow habitat, removal of informal trails, riparian restoration and establishment of designated river access points, and use of boardwalks and hardened surfaces.	Actions would enhance the biological ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within 100 feet of the river would be removed. Designated raft put-in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged; the biological ORV would be enhanced segmentwide.
Stoneman Meadow and Curry Orchard Parking Lot	Provide 430 parking spaces through a re-design of the parking lot.	Engineering solutions included to promote water flow and increase drainage to Stoneman Meadow. Change would not result in result in additional effects to meadow and riparian habitat on a segmentwide level.
New campsites at Upper Pines, Backpacker's, Camp 4, Eagle Creek, and Upper and Lower River Campgrounds	New campsites constructed at Upper Pines, Upper River, Lower River, Backpacker's, Eagle Creek and Camp 4 out of the 150-foot riparian buffer.	New campsites would be located 150 feet away from the river to protect riparian areas from direct impacts related to the increase in visitor activity in these areas. Fencing and designated river access points would also direct use to resilient areas. Monitoring would proactively assess the effectiveness of these actions and established triggers to ensure that future protective measures are implemented in a timely manner. Change would result in protection of the ORV segmentwide.
Ahwahnee, Stoneman and Sugar Pine Bridges	All three historic bridges are retained. Existing riparian impacts mitigated with strategic placement of large wood on riverbanks and the addition of brush layering and constructed log jams to address scouring.	Actions would increase channel complexity and reduce channel widening, erosion, and scouring, thereby enhancing riparian communities locally.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center Parking Area	Move the Yosemite Village Day Use Parking Area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places.	These changes would reduce effects to riparian corridor and enhance ORV components as use would be relocated away from areas critical to river or meadow function. The ORV would be enhanced locally.
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 units out of river bed and banks. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.	These changes would reduce effects to riparian corridor and enhance ORV components locally due to restoration. In addition access would be directed to resilient sandy beaches.

**TABLE 8-123: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR BIOLOGICAL ORV-2 (CONTINUED)**

Location	Action in Alternative 6	Effects to ORV-2
<b>Yosemite Village and Housekeeping Camp (cont.)</b>		
Ahwahnee Row and Tecoya Dorms Concessioner Housing	Create 50-foot setback from Indian Creek – ecologically restore the riparian habitat and protect by restoration fencing.	These changes would remove uses from the riverbank thus reducing erosion and trampling impacts in riparian corridor and enhancing ORV components locally.
Sentinel Drive Roadside Parking	Remove roadside parking along Sentinel Drive and restore to natural conditions.	These changes would remove uses from the riverbank thus reducing erosion and trampling impacts in riparian corridor and enhancing ORV components locally.
Yosemite Village Day Use Parking Area/Roundabouts	Move the Yosemite Village Day Use Parking Area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places. Two traffic roundabouts, one at the Village Drive and Northside Drive intersection at Yosemite Village Day Use Parking Area and one at the intersection of Sentinel Drive and Northside Drive, would be needed. A pedestrian undercrossing would be constructed to address traffic congestion and pedestrian/vehicle conflicts.	The extent of construction would partially encroach into Cook's Meadow; however wetlands would be restored by moving development away from the river. Mitigations would compensate wetland loss, and protect sensitive areas from staging impacts such as compaction and erosion. The ORV would be protected locally.
<b>Yosemite Lodge and Camp 4</b>		
Superintendent's House (Residence 1)	Remove and relocate to the NPS housing area outside of the river corridor.	Relocation of this facility outside of the river corridor may reduce informal trailing in the adjacent meadow thereby enhancing the ORV locally.
Yosemite Lodge Road and Northside Drive	Construct a pedestrian underpass to address congestion at intersection and alleviate pedestrian/vehicle conflicts. Roadside parking would be removed and more culverts would be added. Implementation of mitigations would protect the riparian corridor from erosion, pollutants, and general habitat disturbance during construction.	Changes would remove and redirect uses from the riverbank thus reducing erosion and trampling impacts in riparian corridor; the ORV would be protected locally.
Yosemite Lodge Visitor Facilities	In addition to retaining the existing 245 units, construct new 3-story lodging structure(s) with the pre-flood number of 440 units (redesign Yosemite Lodge out of the 100-year floodplain).	New and existing lodging would be outside the 100-year floodplain and would not affect meadow or riparian habitat; the ORV would continue to be protected locally.
Northside Drive (Stoneman Bridge to Yosemite Village Day Use Parking Area)	Facility retained. A component of the primary transportation & circulation road system that connects all major visitor service nodes. Hydrologic connectivity improved by increasing culverts.	Change has a localized effect on the ORV as road bisects meadow but in keeping with recreational designation; ORV would continue to be protected segmentwide.

To ensure Biological ORV-2 is protected by this plan and protected and enhanced through time, the NPS would continue to monitor the condition of the ORV to provide early warning of conditions that require management action before impacts occur. Regular monitoring would also reveal whether conditions have reached trigger points; and, if so, the NPS would implement specific response actions (as described in Chapter 5) to avoid or minimize adverse effects.

**Conclusion.** Under Alternative 6, the biological ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Actions would further enhance riverbanks and meadows. Removal or relocation of select campsites and infrastructure and reduced use would improve meadow conditions in this segment and thereby enhance the biological ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### ***Geological/Hydrological ORV-5 – The “Giant Staircase”***

The NPS has no immediate management considerations with respect to the Giant Staircase characteristic of the geology of Yosemite Valley above Happy Isles as this geologic ORV is determined to be absent of adverse effects and degradation. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

### ***Geological/Hydrological ORV-6 – Rare, Mid-elevation Alluvial River***

As described in Chapter 5, the NPS selected the status of riparian habitat as the indicator to specifically assess the effectiveness of actions designed to protect this and other ORV. This ORV integrates geologic/hydrologic processes and the condition of aquatic, riparian, and floodplain communities.

The following actions are included to specifically protect and enhance Free-flowing Conditions and Biological ORV-2, but would also address the protection and enhancement of ORV-6.

- Large wood, constructed log jams, and brush layering would be used in the vicinity of bridges to decrease bed scouring and streambank instability. Riprap would be removed where possible and replaced with native riparian vegetation, using bioengineering techniques. In the event that such actions do not improve conditions, bridge redesign or removal could be reconsidered.
- Removing abandoned underground infrastructure, along the river corridor would be part of a comprehensive strategy to correct altered surface and subsurface hydrology.
- Remove riprap where riverbanks do not need stabilization to allow for channel migration. Replace riprap with bioengineered riverbanks, integrating native riparian vegetation, where riverbank stabilization is necessary for protection of critical infrastructure.

**TABLE 8-124: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR GEOLOGICAL/HYDROLOGICAL ORV-6**

Location	Action in Alternative 5	Effects to ORV-6
<b>Curry Village and Campgrounds</b>		
North, Lower and Upper Pines Campgrounds and Backpackers Campgrounds	All campsites within 100 feet of the river would be removed. Designated raft put-in areas established.	These changes would result in less erosion along the riverbank because designated access points to resilient areas are identified for visitors, and sensitive areas would be restored and access would be discouraged; the biological ORV would be enhanced segmentwide
Curry Village Lodging	Lodging would include 453 units, (290 tents and 163 hard-sided units)	Lodging is outside the 100 year floodplain and is not causing adverse effects or degradation to ORV-6 on a segmentwide basis.
Ahwahnee, Stoneman and Sugar Pine Bridges	All three bridges are retained.	Existing riparian impacts mitigated with strategic placement of large wood on riverbanks and the addition of brush layering and constructed log jams to address scouring.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center Parking Area	Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places.	These changes would reduce effects to riparian corridor and locally enhance ORV components as use would be relocated away from areas critical to river or meadow function.
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 units out of observed ordinary high water mark. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.	These changes would reduce effects to riparian corridor and locally enhance ORV components due to restoration. In addition access would be directed to resilient sandy beaches.
Ahwahnee Row and Tecoya Dorms Concessioner Employee Housing	Remove housing and development out of the 100-year floodplain, recontour topography, decompact soils, and restore stream hydrologic function.	Changes would result in reduction of residential activities in riparian areas; biological ORV would be enhanced locally.
Yosemite Village Day Use Parking Area /Roundabout	Construct a pedestrian underpass and roundabout at Yosemite Village Day Use Parking Area parking area to address congestion at intersection and alleviate pedestrian/vehicle conflicts.	The extent of construction would encroach into Cook's Meadow; however wetlands would be restored by moving development away from the river. Expect a net increase in wetland areas. Mitigations would protect sensitive areas from staging impacts such as compaction and erosion.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	Construct 300 vehicle parking spaces and 15 tour bus parking spaces.	Implementation of mitigation measures would protect the floodplain from erosion and other disturbance during construction.
Yosemite Lodge Visitor Facilities	Retain the existing 245 units.	Lodging is outside the 100 year floodplain and is not causing adverse effects
Yosemite Lodge Concessioner Employee Housing	Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees. Construct 78 employee parking spaces.	Lodging is outside the 100 year floodplain and is not causing adverse effects



**TABLE 8-124: SEGMENT 2 ACTIONS AND IMPLICATIONS FOR GEOLOGICAL/HYDROLOGICAL ORV-6 (CONTINUED)**

Location	Action in Alternative 5	Effects to ORV-6
<b>Yosemite Lodge and Camp 4 (cont.)</b>		
Yellow Pine Administrative Site	Retain 4 group administrative use sites (up to 120 people).	Campground is within floodplain but would undergo restoration and is not impacting areas critical to river function.
Yosemite Lodge Road and Northside Drive	Construct a pedestrian underpass and roundabout to address congestion at intersection and alleviate pedestrian/vehicle conflicts.	Roadside parking would be removed and more culverts would be added. Implementation of mitigations would protect the riparian corridor from erosion, pollutants, and general habitat disturbance during construction. Changes would remove and redirect uses from the riverbank thus reducing erosion and trampling impacts in riparian corridor.
El Capitan Crossover	Facility retained. This roadway segment is a key connector between Northside and Southside Drives and serves as an exit point at west end of Yosemite Valley.	Bridge protects riparian habitat from destruction caused by random crossings throughout the river corridor
Northside Drive (Stoneman Bridge to Yosemite Village Day Use Parking Area)	Remove portion of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Removes facility that currently has a localized affect on the ORV. Restoration enhances the ORV in this area.

To ensure this ORV is protected and enhanced through time, the NPS would monitor the condition of the ORV using the status of riparian habitat as an indicator, and take specific actions should conditions reach trigger points.

**Conclusion:** Under Alternative, the geologic/hydrologic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. All actions would enhance the 10 and/or 100-year floodplains and this ORV. Actions to protect and enhance free-flowing conditions as well as meadows and riparian complexes in Segment 2 would result in additional enhancement of the geologic/hydrologic ORV. The recreational segment of the Merced River corridor in East Yosemite Valley would remain readily accessible by road and will have appropriate development along the shorelines. The scenic portion of Segment 2 in West Yosemite Valley would remain free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

### ***Cultural ORV-8 – Yosemite Valley American Indian Ethnographic Resources***

As described in Chapter 5, Yosemite Valley American Indian ethnographic resources include relatively contiguous and interrelated places that are inextricably and traditionally linked to the history, cultural identity, beliefs, and behaviors of contemporary and traditionally-associated American Indian tribes and groups. Management considerations related to ethnographic resources involve park operations, crowding, and visitor use. Actions included in the Merced River Plan/DEIS include:

- Continue coordination between traditionally associated American Indian tribes, groups, and traditional practitioners (through the Park American Indian Liaison) with law enforcement, fire

management, interpretation, invasive species, ecological restoration, and facilities management programs;

- Continue to provide operational guidelines for material staging areas, parking, etc. to protect ethnographic resources;
- Ensure access for traditionally-associated American Indians for participation in annually scheduled traditional cultural events. In addition, tribal access for the personal conduct of ongoing traditional cultural practices would be assured through the Yosemite tribal fee waiver pass program.
- Reduce and formalize day-use parking capacity Manage access in Segment 2 to protect traditionally-used plant populations in the river corridor during periods of high use.
- A series of actions to improve and relocate parking (described further below and in Chapter 8) would protect Cultural ORVs by removing these uses from the proximity of several cultural resources.

Threats to traditionally-used plant populations include invasive species such as Himalayan Blackberry (*Rubus armeniacus*), drainage and hydrology impacts to meadows, and erosion and revetments that affect riparian vegetation. The *Merced River Plan/DEIS* would address these considerations through the following actions:

- The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program would address impacts to some traditionally-used plant populations in some locations.
- Restoration actions to protect riparian areas, meadows, and hydrological resources would further contribute to the protection and enhancement of the traditional-use plant communities included in this ORV.
- Introduction of seedlings to affected stands of black oaks and protection as necessary to ensure that ratios of adults to saplings is at least 0.65.
- Primary actions to manage major vista points under Scenic ORV-16 include mechanical thinning or removal of conifer trees. This action would be coordinated to ensure that the ORV-8 trigger point for the ratio of sapling to adult trees is not exceeded.

Facilities that would remain in this segment of the river have no direct impact on the ethnographic component of the cultural ORV as indicated in the baseline condition assessment.

The *Merced River Plan/DEIS* proposes a variety of actions to address specific considerations including continued coordination between traditionally associated American Indian tribes, groups, and traditional practitioners and the NPS; continued access for traditionally associated American Indians for participation in annually scheduled traditional cultural events; and ecological restoration actions to protect and enhance traditionally used plant populations. To prevent future impacts, the NPS would monitor the condition of the ORV, and take specific actions should additional trigger points be exceeded.

**TABLE 8-125: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-8**

Location	Action in Alternative 6	Effects to ORV-8
<b>Segmentwide</b>		
Traditional Cultural Property Documentation	Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary	Documentation, mapping, and evaluation would provide the detail necessary to protect and enhance the ORV segmentwide.
Visitation	21,800 people per day	This level of visitation may continue to result in a lack of privacy for traditional cultural practices in particular locations seasonally. Access to annually-scheduled traditional cultural events and personal conduct of traditional cultural practices would be assured thereby continuing protection of the ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
North Pines, Lower Pines, and Backpackers Campgrounds	Remove camp sites, including from North Pines (14), Lower Pines (5), and Backpackers (15), and restore the area within 100' of the floodplain with native plant communities.	Removal of campsites from the floodplain would reduce effects to riparian corridor and enhance plant growth and support native restoration. New campsites would be located 150 feet away from the river to protect riparian areas from direct impacts related to potential trampling. Fencing and designated river access points would also direct use to resilient areas. The ORV would continue to be protected segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
Ahwahnee Meadow	Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions. Remove the tennis courts from the black oak woodland.	Removal of the abandoned infrastructure and native plant revegetation will allow for recruitment of desirable black oaks in this area thereby enhancing the ethnographic component of the cultural ORV locally.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	Construct 300 vehicle parking spaces and 15 tour bus parking spaces.	Additional parking near the Waghoga designated use area will enhance access for traditional practitioners to participate in ongoing cultural practices; thereby enhancing the ORV segmentwide.
Yellow Pine Administrative Site	Retain 4 group administrative use sites (up to 120 people).	Campground is within culturally important areas but is not currently impacting resources due to location and level of use. Retention of Yellow Pines Campground will enhance access for traditional practitioners to participate in ongoing traditional cultural practices segmentwide.

**TABLE 8-125: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-8 (CONTINUED)**

Location	Action in Alternative 6	Effects to ORV-8
<b>Yosemite Lodge and Camp 4 (cont.)</b>		
Eagle Creek New Campground	New campground developed east of El Capitan Picnic Area with ~79 car and recreational vehicle sites.	Implementation of mitigation measures would protect planted areas from disturbance during construction; the ORV would continue to be protected locally.
Former Bridalveil Sewer Plant	Remove the buried infrastructure.	Removal of abandoned infrastructure and native plant revegetation will allow for recruitment of desirable black oaks in this area thereby enhancing the ethnographic component of the cultural ORV locally.

**Conclusion.** Under Alternative 6, the ethnographic component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Actions to protect and enhance floodplains, meadows and riparian complexes in Segment 2 would result in additional enhancement of the traditionally-used plant resources of the ethnographic component of the cultural ORV. Actions that would remove infrastructure and restore black oak woodlands would also enhance a critical component of this ORV. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would not limit access to traditional practitioners because measures would be in place to ensure access to annually-scheduled events as well as individual access for ongoing traditional cultural practices. Furthermore, the overall reduction in visitation under Alternative 6 would reduce the effects of crowding and enhance privacy for traditional cultural practices.

### ***Cultural ORV-9 – Yosemite Valley Archeological District.***

The Yosemite Valley Archeological District is a linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River. Heavily-used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling stock trail use, parking and informal rock climbing can all affect ORVs in this area. Archeological resource protection would be achieved through actions in this plan to manage visitor use levels, divert foot traffic around sites, removing informal trails, and formalizing river and meadow access locations, mitigating ecological restoration practices by using noninvasive techniques wherever possible. Many of the actions related to ecological restoration in Segment 2, such as delineating roadside parking, would also help protect archeological sites by diverting foot traffic away from sites and into less sensitive areas. Actions to enhance the recreational ORV in Segment 2 would manage recreational users both in terms of flow and location of users at any one time. A reduction in people and vehicles at one time in Yosemite Valley could also reduce visitor use-related effects on archeological resources.

Site-specific treatment actions would be developed through site management plans, where necessary, to avoid resource loss through park actions (such as development, repair, and maintenance of facilities and underground utilities to support visitor use or natural forces).

Management considerations for this ORV also involve continuing to survey and monitor archeological resources as well as update required documentation.

**TABLE 8-126: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-9**

Location	Action in Alternative 6	Effects to ORV-9
<b>Segmentwide</b>		
Removal of abandoned infrastructure at Eagle Creek/Rocky Point, Bridalveil Fall Sewer Plant, Royal Arches Meadow, corridor-wide	Remove abandoned underground infrastructure	Individual actions will be subject to NHPA Section 106 review to avoid and/or mitigate effects to archeological resources. This action could result in local effects to the archeological component of the cultural ORV, however, the river value would continue to be protected segmentwide.
Concessioner Employee Housing	Temporary employee housing would be removed and replaced with permanent housing at Huff House (164 beds), Lost Arrow (50 beds) and Yosemite Lodge (104 beds).	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
<b>Curry Village and Campgrounds</b>		
New campsites at Upper Pines, Backpacker's, Camp 4, West of Yosemite Lodge, and Upper and Lower River Campgrounds	All campsites within 100 feet of the river would be removed. Upper Campsite in culturally sensitive area. New campsites and infrastructure constructed out of the 150-foot riparian buffer. Lower River – designate river access at Housekeeping Camp eastern beach	Design, follow-on compliance, and mitigation measures would avoid or mitigate effects to sensitive archeological resources. Actions would continue to protect the ORV segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Yosemite Village Day Use Parking Area/Roundabouts	Move the Yosemite Village Day Use Parking Area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places. Two traffic roundabouts, one at the Village Drive and Northside Drive intersection at Yosemite Village Day Use Parking Area and one at the intersection of Sentinel Drive and Northside Drive would be needed. A pedestrian undercrossing would be constructed to address traffic congestion and pedestrian/vehicle conflicts.	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking Area	Construct 300 vehicle parking spaces and 15 tour bus parking spaces.	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Yosemite Lodge Intersection Congestion	Design a pedestrian underpass to alleviate pedestrian/vehicle conflicts.	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.

All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under Alternative 6 would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Facilities that would remain in this segment of

the river have no direct impact on the archeological component of the cultural ORV as indicated in the baseline condition assessment.

The NPS would delineate bike paths, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; remove graffiti at rock art and other sensitive features, conduct public education to discourage climbing, and remove climbing hardware from sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

**Conclusion:** Under Alternative 6, the archeological component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Localized visitor-use-related impacts to archeological resources would be addressed through various enhancement actions. All ground disturbances associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and monitoring (as needed) to ensure that archeological resources are protected. Reduction in maximum people per day in Yosemite Valley, and management of user capacity and visitor use would reduce the potential for visitor use impacts.

### ***Cultural ORV-10 – Yosemite Valley Historic Resources***

As described in Chapter 5, the Yosemite Valley Historic Resources represent a linked landscape of river-related or river-dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system. Protective actions to address management concerns related to the Yosemite Valley Historic Resources ORV-10 include:

- Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to “good” condition.
- Develop a Historic Structures Report for the LeConte Memorial Lodge NHL to determine the rehabilitation needs to bring the building to “good” condition.
- Rehabilitate the Superintendent’s House (Residence 1) per the Historic Structure Report (Lingo 2012) to bring the building to “good” condition. This rehabilitation of the building will occur under all action alternatives, regardless of whether the building is relocated.

Relocation of the Superintendent’s House (Residence 1) is proposed under Alternative 6 to address the 1982 Guidelines for the Wild and Scenic Rivers Act that requires managing agencies to consider relocation of major public use facilities outside of the river corridor. The Superintendent’s House



**TABLE 8-127: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-10**

Location	Action in Alternative 6	Effects to ORV-10
<b>Curry Village and Campgrounds</b>		
Stoneman Meadow and Curry Orchard parking lot	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. Extend the meadow boardwalk through wet areas to Curry Village (up to 275').	Change would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
Curry Village Lodging	Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.	Mitigation measures would contribute to documentation and interpretation of historic cultural resources during facility removal. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective. The ORV would be protected segmentwide.
Huff House Employee Housing	Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	Mitigation measures would protect cultural resources during facility removal and construction. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective. The ORV would be protected segmentwide.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts. Tennis courts are located in a sensitive cultural area	Mitigation measures would protect cultural resources during facility removal. Change would not affect contributing element of the Yosemite Valley Historic Resources ORV collective.
Ahwahnee Parking Lot	Follow the recommendations from the Ahwahnee Historic Structures Report (1997) and the Ahwahnee Cultural Landscape Report (2010) when redesigning the Ahwahnee Parking Lot to bring the Ahwahnee stone gate house and the Ahwahnee Parking Lot to "good" condition.	Redesign of the Ahwahnee Parking Lot would rehabilitate contributors to the cultural ORV thereby enhancing the Yosemite Valley Historic Resources ORV locally and segmentwide.
Yosemite Village Day-Use Parking Area	Remove Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Re-align the intersection at Northside Drive and Village Drive. Add a three-way intersection at Sentinel Drive and the entrance to the parking area. Provide on-grade pedestrian crossings.	The removal of historic and non-historic properties and re-alignment/re-establishment of the intersections would affect circulation patterns locally. Change is not likely to affect buildings and structures included in the Yosemite Valley Historic Resources ORV collective.
Superintendent's House (Residence 1)	Relocate outside the river corridor to the NPS housing area. Rehabilitate historic structure in new location.	The action would remove a contributor to the Yosemite Valley Historic Resource ORV resulting in localized effects. Mitigation measures include documenting and interpreting the resource. The loss of this resource would not result in a segmentwide adverse effect of the collective of resources.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	The action would affect trails that are connected by the historic footbridges which are components of the Yosemite Valley Historic Resources ORV. Mitigation measures and Section 106 review would ensure the protection of the historic resources and the redesign could result in enhancement of the ORV locally.

(Residence 1) is a component of the Yosemite Valley Historic Resources component of the cultural ORV in Segment 2. The NPS would document and interpret any building or structure threatened with removal or relocation. In this manner, while the individual tangible element or elements may be lost or moved, a record of their existence and historical significance would still be available to the public.

To address management considerations, the *Merced River Plan/DEIS* proposes continuing the active program of maintenance for historic buildings and structures; employing existing design guidelines to ensure that new development or redevelopment complements the ORV and the Yosemite Valley Historic District; and periodically assessing and updating professional documentation for the historic resources.

Ecological and scenic value restoration actions in Segment 2 would enhance the cultural landscape which contributes to the historic setting of the resources that comprise the ORV-10. There are no construction actions associated with Alternative 6 that would affect the spatial organization of the historic resource collective, though changes in the circulation patterns as a result of re-routing roads at the Yosemite Village day-use parking area and at Stoneman Meadow would affect circulation patterns that are associated with this ORV. These effects would be localized and would not affect the condition of the ORV on a segmentwide level.

**Conclusion:** Under Alternative 6, the historic resources component of the cultural ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Relocation of the Superintendent's House (Residence 1) would result in localized effects that would be mitigated through documentation and interpretation. Once removed or relocated, these resources would no longer be considered part of the ORV collective. All disturbances to circulation and spatial organization associated with ecological restoration actions; removal of buildings and infrastructure; re-routing of roads; and, parking lot and campground construction under this alternative would be subject to park standard operating procedures, subject matter expert review, and documentation (as needed) to ensure that historic resources are protected.

### ***Scenic ORV-16 – Iconic Scenic Views in Yosemite Valley***

Visitors to Yosemite Valley experience scenic views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls. Actions intended to manage natural resources may include the use of prescribed fire or controlled burns to thin forests that are encroaching on meadows; cutting trees, tree branches or other vegetation by mechanical means; and the application of herbicides to control invasive species. Related actions intended to protect the Recreation ORV would limit the number of visitors to lessen visitor density and congestion at attraction sites and make improvements to the transportation system that would reduce automobile congestion. Air quality can affect visitors' ability to experience scenic values in Segment 2. The NPS would cooperate with regional authorities to reduce airborne contaminants caused by combustion, including carbon dioxide emissions, smoke caused by fire, particulate matter generated by construction, and to improve air quality conditions.

In consideration of Wild and Scenic River Act requirements that the NPS consider the presence of existing structures, major facilities and services provided for visitor use, the NPS would eliminate several structures and facilities in Segment 2 under this alternative. Under Alternative 6 actions would remove structures at the Ahwahnee pool and tennis court. Removal of these structures could enhance scenic resources from specific

locations. Ecological restoration actions in Segment 2 would enhance the meadow and riparian communities which contribute to the scenic values in Yosemite Valley. This recreational river segment would remain readily accessible by road and will continue to have appropriate development along the shorelines (a comprehensive list of facilities in Segment 2 is included in table 7-1). Facilities that would remain in this segment of the river have no direct impact on the scenic river value as indicated in the baseline condition assessment. Changes to parking and vehicle traffic in Yosemite Valley to enhance Recreational ORV- 20 particularly the removal of roadside parking along Sentinel Drive and restoration to natural conditions would enhance Scenic ORV-16.

**TABLE 8-128: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR SCENIC ORV-16**

Location	Action in Alternative 6	Effects to ORV-16
Select Scenic vista Points	(Common to All) Selectively thin conifers and other trees and shrubs that encroach on selected scenic vista points. Remove unnecessary facilities and ensure that all future development satisfies objectives that provide low contrast ratings.	Changes would enhance the scenic values on a segmentwide level.
Yosemite Valley Concessioner Housing	Temporary employee housing would be removed and replaced with permanent housing at Huff House (164 beds), Lost Arrow (50 beds) and Yosemite Lodge (104 beds).	Mitigation measures would avoid or mitigate effects to iconic scenic vistas. Actions would continue to protect the ORV locally.
<b>Curry Village and Campgrounds</b>		
Yosemite Valley Campgrounds	All campsites within 100 feet of the river removed. New campsites installed at Upper Pines, Upper River and Lower River, Backpacker's and Camp 4 and Eagle Creek campgrounds.	Changes to campgrounds would not interfere with iconic scenery and given the location of the facility would not cause impact scenic resources. Removal of the campgrounds near the river will enhance viewsheds locally.
<b>Yosemite Village and Housekeeping Camp</b>		
Yosemite Village Day Use Parking Area/Village Center Parking Area	The Concessioner General Offices, Concessioner Garage, and the Bank Building are removed. Move the Yosemite Village Day Use Parking Area day-use parking area northward 150 feet away from the river to facilitate restoration goals. Formalize parking area with a total of 850 parking places.	Removal of buildings would enhance viewsheds locally.
<b>Yosemite Lodge and Camp 4</b>		
Yosemite Lodge Parking	Construct 300 vehicle parking spaces and 15 tour bus parking spaces. 25 additional spaces at Yosemite Lodge due to redesign, improving parking efficiency near Northside Drive.	Changes to parking would be in keeping with current facility and given the location of the facility would not interfere with iconic scenery. Actions would continue to protect the ORV locally.
Yosemite Lodge Visitor Facilities	Construct new 3 story-lodging structure(s) with the pre-flood number of 440 units (redesign Yosemite Lodge out of the 100-year floodplain).	Rebuild of existing facility is in an already developed area and would not interfere with iconic scenery. Actions would continue to protect the ORV locally.
Yosemite Lodge Road and Northside Drive	Construct a pedestrian underpass to address congestion at intersection and alleviate pedestrian/vehicle conflicts.	Change would not be visible post construction and would not interfere with iconic scenery. Actions would continue to protect the ORV locally.

**Conclusion:** Under Alternative 5, the scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. Tree thinning and ecological restoration actions would improve natural scenic conditions. Removal of buildings at Housekeeping Camp, the Concessioner Garage, the Concessioner General Offices, and the Concessioner Stables would reduce intrusions on scenic resources. All parking lot and campground construction under this alternative would be subject to park standard operating procedures and subject matter expert review to ensure that scenic resources are protected.

### ***Recreational ORV-20 – River-related Recreation in Yosemite Valley***

Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River. Throughout the Yosemite Valley segment, the river has provided the setting for recreational experiences such as fishing, floating, and sightseeing. Transportation is considered an important part of the visitor experience in Yosemite Valley because it is the means of access to recreational opportunities in Yosemite Valley. Management considerations address the amount of vehicle traffic and the number of people at one time in Yosemite Valley at the peak times of day during the park's busy summer season.

All restoration actions to protect and enhance biological, cultural, geologic/hydrologic, and scenic ORVs would further enhance visitors' connections to the river and its values, which are essential to the recreational ORV in this segment. These actions would ensure that the increase in day-use, camping, and lodging opportunities would not cause adverse effects or degradation to ORV-20 on a segmentwide basis. Camping and overnight lodging would be available segmentwide, and essential aspects of the recreational ORV would not be affected. There are also actions proposed in Alternative 6 that would improve picnicking, and wayfinding. Finally, commercial boating is limited to 100 boats at one time and private boating is limited to 150 trips per day in Segment 2, in this alternative which reduces crowding and increases the stretches of the river on which private boating and paddling is allowed, thereby enhancing key aspects of this recreational experience.

**TABLE 8-129: SEGMENT 2 ACTIONS AND THEIR IMPLICATIONS FOR RECREATIONAL ORV-20**

Location	Action in Alternative 6	Effects to ORV-20
Segmentwide visitation	21,800 visitors per day	This managed change in visitation would reduce crowding and congestion thereby enhancing the recreation ORV on a segmentwide level.
Concessioner Stables	Retain Concessioner Stables to support Merced Lake High Sierra Camp and overflow parking for campgrounds. Commercial equestrian day rides would be eliminated. Kennel service remains. Retain associated housing (25 beds).	Changes similar to current conditions and would not substantially alter components of the river recreation experience.
Curry Village Lodging	Lodging would include 453 units, as compared with 400 under Alternative 1.	Changes to Lodge would be in keeping with current facility. Lodge itself is not part of the ORV-20 but does facilitate access to ORV-20 for certain visitors. This use would remain.
Lower Rivers Nature Walk	Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	Change would improve interpretation of the river and its values, and would enhance the recreation ORV in this segment.
<b>Yosemite Village and Housekeeping Camp</b>		
The Ahwahnee Pool and Tennis Courts	Remove the pool and tennis courts	Removal of facilities would reduce opportunities for one type of recreation activities, but would not substantially alter components of the river recreation experience.
Segment wide River Access	Swimming and water play allowed in all segments except 6, impoundment. No commercial boating. Boating allowed on all segments except 6, impoundment. Private use limited to 150 trips per day/commercial to 100 boats at one time in Segment 2 between the Pines Campgrounds and Sentinel Beach.	Change would limit commercial boating and would limit the number of private boating. However, this change does not affect components of the recreational ORV. This reduction in boats enhances dispersed recreation along the river corridor.
Housekeeping Camp Lodging	Retain 232 lodging units, and remove 34 units out of observed ordinary high water mark. Retain Housekeeping Camp shower houses, restrooms, and laundry, and remove grocery store. Restore one acre of the riparian ecosystem.	Changes similar to current conditions and would not substantially alter components of the river recreation experience.
Bridalveil Falls Trail	Redesign trails, boardwalks, and viewing at the base of the falls to improve wayfinding and pedestrian circulation. Restore informal trails. Improve ADA compliance of pedestrian walkways and restrooms.	Change would bring about localized improvements in aspects of the visitor experience (circulation and wayfinding) thus enhancing ORV-20.
<b>Yosemite Lodge And Camp 4</b>		
Yosemite Lodge Visitor Facilities	Construct new 3 story-lodging structure(s) with the pre-flood number of 440 units (redesign Yosemite Lodge out of the 100-year floodplain).	Lodge itself is not part of the ORV-20 but does facilitate access to ORV-20 for certain visitors. This use would remain
Yellow Pine, Camp 4, Yosemite Lodge, and West Valley Campgrounds.	Remove camping and restore the 100-year floodplain to natural conditions. Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4. Retain 4 group administrative use sites (up to 120 people).	Improvements to campgrounds would improve recreational experience.
Recreational Experience Quality	Reduction in available day-use parking, and implementation of an East Yosemite Valley Day-use Parking Permit system	This will enhance the recreational experience of segment 2 by reducing crowding at key attraction sites as well as access to these areas (along roadways, in parking lots, etc).

Chapter 6 provides a more detailed description of the day-visitor capacity management strategies that directly measure aspects of the Recreation ORV and outlines specific actions. These actions include:

- Utilize parking and traffic management staff to improve parking efficiency and traffic flow in Yosemite Valley and other locations where needed.
- Institute a transportation fee at entrance stations (for peak-use season).
- Divert vehicles to other destinations outside of Yosemite Valley when parking in the Valley fills.
- When all parking fills to capacity, day visitors would be diverted at checkpoints throughout the park and at entrance stations.
- East Valley day-use parking permits would be issued by advanced reservation and on a first-come-first-serve basis.

NPS would use the Highway Capacity Manual Pedestrian Level of Service (discussed further in Chapter 5) for evaluating the capacity and quality of service of transportation facilities, including walkways, multi-use paths, and similar pedestrian facilities. NPS would also monitor parking rates and vehicles at one time to ensure that they are not exceeding the management standard. Should specific trigger points be reached, the NPS would implement a series of specific actions to improve parking to an acceptable level. Similarly, should visitor densities begin to approach specific triggers; NPS would take steps to keep such densities within the management standard.

**Conclusion:** Under Alternative 6, the recreation ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season will significantly reduce crowding thereby enhancing the recreational ORV. All restoration actions would enhance opportunities to connect with the river and its values. The reduction in commercial services would affect opportunities for particular types of recreational activities, but would not affect the essential components of the recreation ORV on a segmentwide basis.

### Segment 3 – The Merced Gorge (Scenic Segment)

#### *Scenic ORV-17 – Scenic View in the Merced River Gorge*

The Merced River drops 2,000 feet over 14 miles; a continuous cascade under spectacular Sierra granite outcrops and domes. There are no existing management considerations with respect to the Scenic ORV in the Merced River Gorge. Although there are some localized visual intrusions from essential facilities such as visitor parking areas, restrooms, the Arch Rock entrance station and the El Portal Road, these facilities are consistent with the scenic classification of this river segment. As explained in Chapter 5, this ORV is currently protected and enhanced.

This alternative does not propose any new development or landscape changes within the river corridor aside from improvements to existing roadside pullouts and drainage. These changes would not degrade or adversely impact the scenic ORV on a segmentwide basis. Although private vehicles and overall visitation during peak periods will be managed for East Yosemite Valley only, it is probable that visitation and visitors



at one time in Segment 3 will also witness a reduction under this alternative. This reduction in visitation and visitors at one time may reduce vehicles per viewshed, thereby enhancing the scenic ORV. Monitoring associated with this ORV would ensure that the attributes that comprise this ORV remain within the accepted management class rating.

Alternative 6 would accommodate the same kinds and amounts of use that exist today in Segment 3. The types and levels of use in Segment 3 under this alternative would remain largely unchanged. Actions considered under Alternative 6 would cause no adverse effects or degradation to ORVs on a segmentwide basis.

**Conclusion:** Under Alternative 6, this scenic river segment would show little evidence of human activity and remain largely free of structures. The scenic ORV in Segment 2 of the Merced River corridor would continue to be absent of adverse effects and degradation on a segmentwide level. The reduction in camping and lodging opportunities, as well as reduction in visitation particularly during the peak season in Yosemite Valley will significantly reduce the number of vehicles per viewshed in this segment. All restoration actions would further enhance scenic characteristics in this segment.

## **Segment 4 – El Portal (Recreational Segment)**

### ***Geological/Hydrological ORV-7 – The Boulder Bar in El Portal***

Natural processes would continue to shape the landscape and the geologic ORV. The NPS has not identified any management considerations with respect to the El Portal boulder bar. Land use and facility actions proposed in this alternative would not affect this ORV. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection are necessary. Moreover, the types and levels of visitor and administrative use (e.g., housing, maintenance operations, office space, passive recreation) allowed under this alternative would not affect this ORV. Therefore, the NPS would not monitor the condition of this ORV as part of the *Merced River Plan/DEIS*.

**Conclusion:** Under Alternative 6, the geologic values of this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no actions that would affect the boulder bar in El Portal, and there are no ongoing concerns or considerations associated with this resource.

### ***Cultural ORV-11 – The El Portal Archeological District***

The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region. Four sites are known to have experienced particularly severe damage, most notably a large ancient village and cemetery.

To address management considerations pertinent to this river value, the NPS would undertake the following actions:

- Protective measures would ensure that exceptional sites would be protected from unmitigated effects that could lead to adverse effects or degradation on a segmentwide level. A plan of action for addressing the abandoned infrastructure on sites would be developed in consultation with traditionally-associated American Indian tribes and groups. Any solution(s) developed would also include a recommended approach for deterring visitor use within the sites.
- Informal trails, non-essential roads, and abandoned infrastructure would be removed to protect and enhance the archeological resources contributing to the ORV in Segment 4.
- Remove informal trails and non-essential roads.

There are no existing instances of adverse effect or degradation to this ORV. As discussed above, management considerations are present associated with abandoned infrastructure that remains on an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians. Management considerations are also associated with non-essential roads and trails that impact archeological sites. In recognition of the high cultural significance of these sites, this alternative requires the park to develop plans to remove abandoned infrastructure and non-essential roads. Restoration actions to establish a 2.5 acre recruitment area for Valley Oaks would further protect adjacent archeological resources. Construction of employee housing in Old El Portal, Abbieville, and Rancheria would be designed to avoid or mitigate threats and disturbances to archeological sites. Monitoring and protective measures would ensure that new use patterns associated with the new housing would not affect contributing elements of the El Portal Archeological District.

**TABLE 8-130: SEGMENT 4 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-11**

Facility	Action in Alternative 6	Effects to ORV-11
<b>El Portal</b>		
Abbieville, Old El Portal, and Rancheria Flat Concessioner Employee Housing	New concessioner employee housing in Abbieville (258 beds), Old El Portal (12 beds), and Rancheria Flat (9 beds).	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Abbieville Trailer Park Area	Develop El Portal Remote Visitor Parking Area in the Abbieville/Trailer Park area to provide 200 spaces of visitor parking serviced by regional transit. Adjacent to cultural resources, however only suitable location proximate with direct access to Highway 140	Design, follow-on compliance, and mitigation measures would avoid and/or mitigate adverse effects to sensitive archeological resources. The El Portal Archeological District would continue to be protected at a segmentwide level.
Odger's Bulk Fuel Storage	(Common to All) Remove Odger's bulk fuel storage facility and restore the rare floodplain community of valley oaks. Create a valley oak recruitment area of 2.5 acre in the vicinity of the current Odger's bulk fuel storage area, including the adjacent parking lots.	Mitigation measures would protect cultural resources during facility removal and ecological restoration. Change would continue to protect archeological resources locally.

**Conclusion:** Under Alternative 6, the archeological resources in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Removal of abandoned infrastructure, informal trails and non-essential gravel roads would enhance protection of archeological resources. Valley Oak restoration actions would protect adjacent archeological resources from further ground disturbance, Construction of new employee housing would be designed to avoid or mitigate effects

to the El Portal Archeological District. New or altered visitor use patterns associated with the new housing development would be monitored and protective actions would occur if effects triggered responses.

## **Segment 5 – South Fork Merced River Above Wawona (Wild Segment)**

### ***Biological ORV-1 – High-elevation Meadows and Riparian Habitat***

The Merced River sustains numerous small meadows and riparian habitat with high biological integrity. Restoration actions to remove informal trails and charcoal rings to protect cultural resources proposed under this alternative would not affect high-elevation meadows. The NPS proposes no major facility or visitor use actions for Segment 5 under Alternative 6. The biological ORV in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level.

### ***Cultural ORV-12 – Regionally rare archeological features representing indigenous settlement including archeological sites with rock ring features***

Three regionally rare prehistoric archeological sites are located along this segment of the South Fork of the Merced Wild and Scenic River corridor. The sites contain unique stacked rock ring constructions and rock alignments. Two sites also contain pine timber remains within the ring interiors or incorporated into the stacked rock courses. Rock constructions are considered fragile and highly subject to human alteration from camping and campfire building disturbances. Two of the South Fork sites are adjacent to formal NPS trails, increasing the likelihood of disturbance. The vicinity of the sites has not been systematically surveyed, and it is possible that additional rock ring sites may be present along the South Fork. Should additional rock ring sites be discovered in the monitoring process, they would also become a part of the South Fork ORV. To remedy these considerations, NPS would:

- Complete documentation of the features. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker). Remove informal trails and charcoal rings.
- Increase education and outreach to Wilderness travelers.

**Conclusion.** Under Alternative 6, the archeological resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. There are no specific actions to manage user capacity, land use, and/or facilities under Alternative 6 within Segment 5 beyond those designed to protect and enhance ORV-12 that would impact components of Cultural ORV-12. Monitoring activities described in Chapters 5 and 8 would continue to protect and enhance Cultural ORV-12 to ensure there are no adverse effects or degradation to ORV-12 on a segmentwide basis.

### ***Scenic ORV 18 – Scenic Wilderness Views along the South Fork Merced River***

The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no

considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

**Conclusion.** Under Alternative 6, the scenic resources in this wild river segment would continue to be absent of adverse effects and degradation on a segmentwide level. The scenic ORV for Segment 5 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

## Segment 7 – Wawona (Recreational Segment)

### *Biological ORV-3 – The Sierra sweet bay (Myrica hartwegii)*

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV would be determined by comparing populations located near Wawona Campground (an area that is likely to be disturbed by humans) with more remote populations that are less likely to receive such disturbance. This population of Sierra sweet bay is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.

To ensure that this biological ORV is protected and enhanced through time, the NPS would monitor the condition of the Sierra sweet bay population to ensure early warning of conditions that require management action before impacts occur.

**Conclusion.** Under Alternative 6, the Sierra Sweet Bay in this recreational river segment would continue to be absent of adverse effects and degradation on a segmentwide level. Reduction in camping and visitor activity in the vicinity of Wawona Campground would enhance this resource.

**TABLE 8-131: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR BIOLOGICAL ORV-3**

Facility	Action in Alternative 6	Effects to ORV-3
<b>Wawona</b>		
Wawona Campground	Retains 72 sites and one group site. Remove 27 sites that are either within the 100-year floodplain or in culturally sensitive areas.	Action would improve the condition of the ORV by reducing the potential effects on this species associated with campground visitation.

### *Cultural ORV-13 – Wawona Archeological District*

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This district spans segments 5, 6, 7, and 8. Accordingly, the condition of this historic property is assessed at the property-level, rather than the segmentwide level. Segment 7 includes the remains of the U.S. Army Cavalry Camp A. E. Wood documenting the unique Yosemite legacy of the African-American buffalo soldiers and the strategic placement of their camp near the Merced River. There are several management considerations for this ORV: the Wawona Archeological District is subject to site-specific impacts from park operations, visitor

use, artifact collection, vandalism, and ecological processes. The following actions would help to address these issues:

- Increase monitoring frequency at affected sites.
- At the district-wide level, revise the existing National Register nomination to reflect changes since its original writing, for example, incorporating newly discovered resources and documenting impacts.
- The Wawona Campground capacity would be reduced to 67 sites (including one group site). 32 sites are removed because they are either within the 100-year floodplain or in culturally sensitive areas.
- Remove informal trails and fire rings to prevent continuing disturbance.
- Develop site management plans as needed for sites with complex uses. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds
- Consider need for archeological site treatment measures to address impacts to shallow deposits of artifacts and features.

**TABLE 8-132: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR CULTURAL ORV-13**

Facility and Land Use	Action in Alternative 6	Effects to ORV-13
<b>Wawona</b>		
Wawona Campground Septic System	Remove septic system, and connect to the sewer system. Build a lift station above the campground to connect to the existing water treatment plant.	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Wawona RV dump site	Relocate the dump site to an appropriate location away from the river.	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Wawona Store	Replace the existing public restroom facilities with larger restrooms to accommodate visitor use levels. Improve picnic area, redesign bus stop.	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide.
Wawona Swinging Bridge	Provide access to Swinging Bridge with access on the south side of the river, delineate trail, restrooms, waste disposal and parking.	Mitigation measures would include avoidance, documentation, data recovery, and interpretation of cultural resources during facility construction. Local impacts to the ORV may occur; however, actions would continue to protect the ORV segmentwide. Restrooms and waste disposal will reduce threats and disturbances to adjacent archeological resources.

The NPS would delineate trails, roads, and other infrastructure away from sensitive cultural and ethnographic resource areas; conduct public education to discourage disturbance to sensitive features. To prevent these considerations, or others, from redeveloping, the NPS would monitor the condition of the ORV, and take specific actions should conditions exceed specific trigger points.

### ***Cultural ORV-14 – Wawona Historic Resources***

The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity. The Wawona Covered Bridge is in good condition, and there are no current management considerations associated with it, however the bridge requires maintenance to keep the historic structure in good condition in the face of adverse weather and visitor use.

The Wawona Hotel complex continues to serve its original purpose as a guest lodging facility. Management considerations related to the hotel complex involve concessioner operations, the need for regular and routine preservation maintenance, and periodic rehabilitation to ensure visitor safety.

- Regular and routine preservation maintenance, conducted in accordance with the Secretary of the Interior’s Standards, would ensure that this upkeep protects the historic character of the buildings
- Periodic rehabilitation would involve subject-matter specialists in planning, design and implementation to ensure actions do not compromise the historical integrity of the complex
- Concessioner operations would ensure that any operational modifications or updates are appropriate and in keeping with the historic character of the complex.

**TABLE 8-133: SEGMENT 7 ACTIONS AND THEIR IMPLICATIONS FOR WAWONA HISTORIC RESOURCES ORV-14**

Facility	Action in Alternative 6	Effects to ORV-14
<b>Wawona</b>		
Wawona Hotel	Retain 104 lodging units at the Wawona Hotel. Retain hotel restaurant, swimming pool and tennis court. Retain golf course and golf shop.	The action would retain contributors to the Wawona Historic Resource. The ORV would continue to be protected locally.

To prevent future impacts, the NPS would monitor the condition of the bridge, and take specific actions should conditions exceed trigger points. Trigger points are selected to inform managers well in advance of adverse effects or degradation on the Wawona Covered Bridge. Management considerations for the Wawona Hotel complex include the need for regular and routine preservation maintenance, periodic rehabilitation, and ongoing operations that serve its continuing function as a historic lodging facility. To address these management considerations, the NPS would ensure that these activities would conform to the Secretary of the Interior’s Standards for Treatment of Historic Properties.

### **Segment 8 – South Fork Merced River below Wawona (Wild Segment)**

#### ***Biological ORV-3 — The Sierra sweet bay (Myrica hartwegii)***

As described in Chapter 5, the NPS would monitor the condition of this ORV through time using Sierra Sweet Bay Population Decline as its indicator. The health of this ORV in Segment 8 is in good condition, with no management considerations present. Management action to enhance the population is not required at this time.



### ***Cultural ORV 13— Wawona Archeological District***

The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade. This ORV in Segment 8 is in good condition, with no management considerations present. Management actions are not required at this time.

### ***Scenic ORV-18 – Scenic Wilderness Views along the South Fork Merced River***

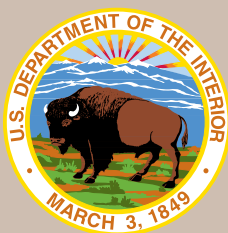
The South Fork Merced River passes through a vast area of natural scenic beauty. The NPS has no immediate management considerations with respect to the Scenic Wilderness Views along the South Fork Merced River as this scenic ORV is determined to be absent of adverse effects and degradation. No new development or landscape changes are proposed within the river corridor. Because there are no considerations regarding the condition of this ORV, no actions other than continued protection is necessary. It is unlikely that this ORV would be affected by human intervention in the future.

The scenic ORV for Segment 8 is determined to be absent of adverse effects, degradation, management concerns, and management considerations. The NPS would not monitor the condition of this ORV.

Merced Wild and Scenic River  
Draft Comprehensive Management Plan  
and Environmental Impact Statement

Yosemite National Park  
P.O. Box 577  
Yosemite, CA 95389

[www.nps.gov/yose/parkmgmt/mrp.htm](http://www.nps.gov/yose/parkmgmt/mrp.htm)



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



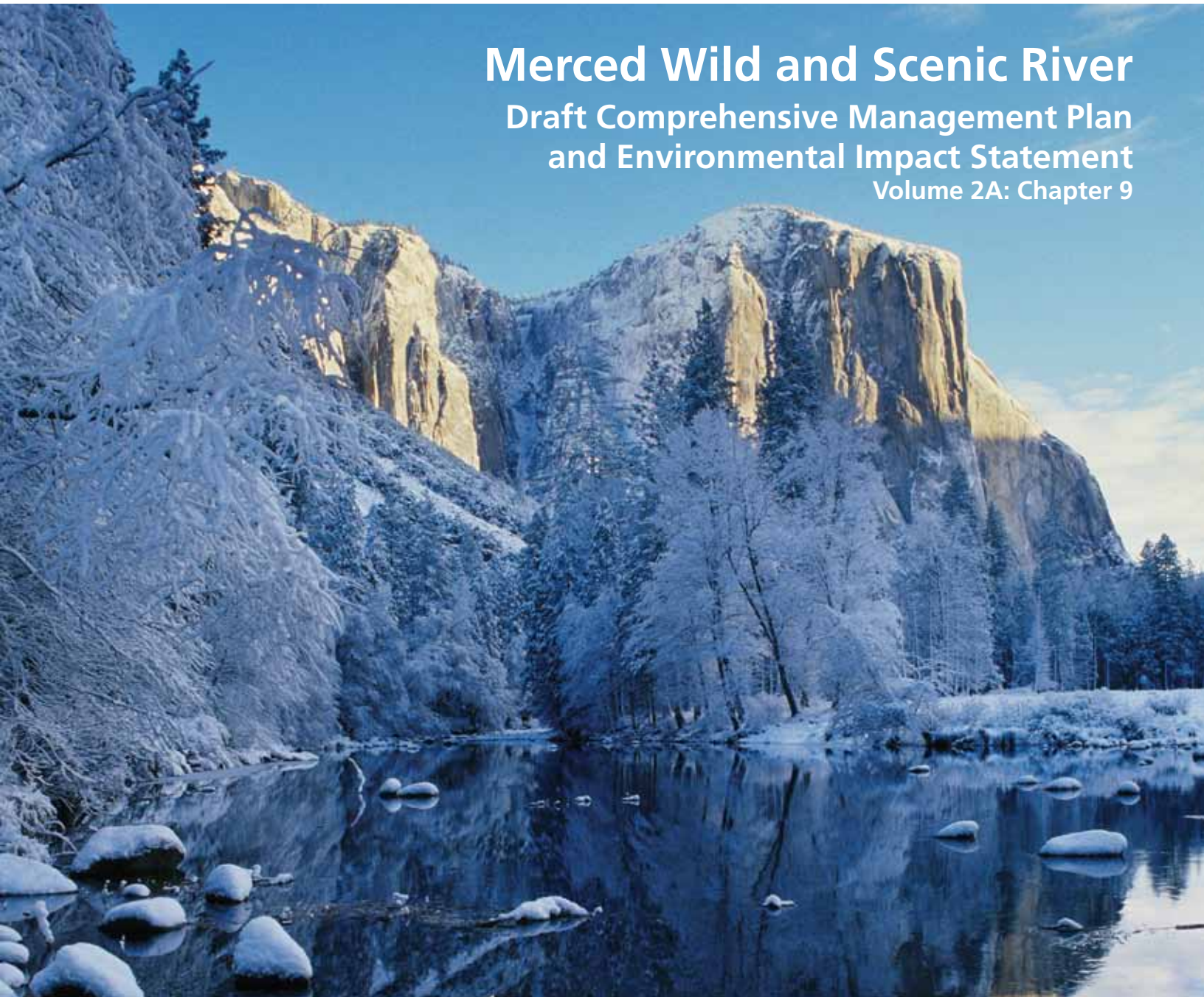
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## Merced Wild and Scenic River

### Draft Comprehensive Management Plan and Environmental Impact Statement

Volume 2A: Chapter 9





**Yosemite National Park**

National Park Service  
U.S. Department of the Interior



# **Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement**

**Volume 2A: Chapter 9**

**January 2013**

# MERCED WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN / DEIS

## Volume 2: Chapters 9-13 and Appendices

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## 9. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

### BACKGROUND

This chapter describes the existing environment that could be affected by the implementation of any of the alternatives analyzed in the *Merced Wild and Scenic River Comprehensive Management Plan/DEIS (Merced River Plan/DEIS)*. It also analyzes the direct and indirect impacts that could result from implementation of each of the alternatives. The information is organized around 19 general topics, which are listed below, along with the topics dismissed from further analysis and the rationale for their dismissal. The general approach to the environmental analysis follows the list of topics.

### GENERAL APPROACH TO IMPACT ANALYSIS

#### Evaluating Impacts under the National Environmental Policy Act

This section provides a scientific and analytic basis for comparisons among the alternatives, in accordance with direction in the National Environmental Policy Act (NEPA) and NPS policy (NPS 2001). The analysis examines both direct and indirect impacts that could result from the alternatives based on the context, duration, intensity, and type of potential impact, and whether the impacts would be cumulative. The following guidelines are applicable to all the analysis topics, with the exception of selected cultural resources and rare, threatened, and endangered species. Historic properties that are listed in or eligible for the National Register of Historic Places are evaluated using guidelines developed for the implementation of the National Historic Preservation Act (see the *Environmental Consequences Methodology* discussion in the “Historic Buildings, Structures, and Cultural Landscapes” subsection of this chapter). Impacts on rare, threatened, and endangered species are evaluated according to direction of the Endangered Species Act (see the *Environmental Consequences Methodology* discussion in the “Special Status Species” and “Wildlife” subsections of this chapter).

**Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the river. The river corridor is defined as  $\frac{1}{4}$  mile on either side of the river as measured from the ordinary high water mark. The Study Area is defined as 1.25 miles on either side of the river. This analysis further identifies if there would be local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area within Yosemite National Park. Regional impacts would be those that extend to the Yosemite gateway region, unless specified differently under each individual topic.

**Duration.** The duration of an impact is noted as either short term or long term in nature. Short-term impacts are typically associated with construction-related actions and could last up to two years unless otherwise noted. Long-term impacts are those that would typically last longer than two years unless otherwise noted.

**Intensity.** The intensity refers to the degree or magnitude of impacts on a resource (either beneficial or adverse). Each impact is identified as negligible, minor, moderate, or major, in conformance with the definitions provided under each impact topic.

**Type.** The type of impact refers to whether the impact is considered beneficial or adverse. Beneficial impacts would improve resource conditions. Adverse impacts would deplete or negatively alter resources. Negligible impacts can be considered beneficial, adverse, or neither, as described in the individual impact assessments.

## **Impact Topics Considered in this Plan**

### ***Natural Resources***

- Geology, Geohazards, and Soils
- Hydrology, Floodplains, and Water Quality
- Vegetation and Wetlands
- Wildlife
- Special Status Species
- Lightscapes
- Soundscapes
- Air Quality

### ***Sociocultural Resources***

- Scenic Resources
- Visitor Experience
- Wilderness Character
- Park Operations and Facilities
- Transportation
- Energy Consumption and Climate Change
- Socioeconomics

### ***Historic Properties***

- Historic Buildings, Structures, and Cultural Landscapes
- Archeological Resources
- American Indian Traditional Cultural Resources



## Impact Topics Dismissed from Further Analysis

To ensure that particular components of the human environment are always considered during preparation of an environmental impact statement, the Council on Environmental Quality (CEQ) developed a list of mandatory topics that must be considered if they would potentially be affected by one or more of the planning alternatives. Items on that list that were considered but dismissed are discussed below.

### *Environmental Justice*

Environmental justice analyses determine whether a proposed action would have “disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.” The NPS and other federal agencies have determined that a disproportionately high and adverse effect on minority and low-income populations means an adverse effect that (1) is predominately borne by a minority population and/or a low-income population, or (2) will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or non-low-income population.

Potential adverse effects identified in an environmental justice analysis include air, noise, and water pollution; soil contamination; destruction or diminution of aesthetic values; destruction or disruption of community cohesion and economic vitality; displacement of public and private facilities and services; increased traffic congestion; and exclusion or separation of minority or low-income populations from the broader community. Of particular concern is the effect on property acquisition and displacement of people.

No aspect of any alternative in the *Merced River Plan/DEIS* would result in disproportionately high and adverse human health or environmental effects on minority or low-income populations. Any restriction on travel, lodging accommodations, or access to any area of the park that might result from the *Merced River Plan/DEIS* would be equally applied to all visitors, regardless of race or socioeconomic standing. The one exception to this policy is that use by culturally associated American Indian tribes and groups is and would continue to be managed independently of general public recreational use. Effects on culturally associated tribes and groups are assessed as part of the *Merced River Plan/DEIS*. (See the “American Indian Traditional Cultural Resources” subsection in this chapter.)

Although levels of park employee housing in various areas may be affected by decisions made under the *Merced River Plan/DEIS*, employee housing decisions are not expected to result in destruction or disruption of community cohesion and economic vitality, displacement of public and private facilities and services, increased traffic congestion, and/or exclusion or separation of minority or low-income populations from the broader community.

### ***Prime and Unique Agricultural Lands***

There are no agricultural lands within Yosemite National Park; thus, no further discussion of this topic is necessary. Also, no alternative in this *Merced River Plan/DEIS* would have any direct or indirect effects on downstream agricultural lands.

### ***Public Health and Safety***

Public health and safety is not presented as a separate topic in this environmental impact statement. Instead, park-related public health and safety issues are adequately addressed under other analysis topics, such as water quality, visitor experience, and park operations and facilities.

### ***Land Use***

Land use within the Merced River corridor is managed under a variety of federal laws, NPS policies, and Yosemite National Park policies and plans. The following laws and policies direct land use in the Merced River corridor: the NPS Organic Act, the Yosemite enabling legislation, the Wild and Scenic Rivers Act, and the Wilderness Act. These all call for the conservation and preservation of the natural, cultural and scenic features of the park, while providing for public use and enjoyment of the area. NPS *Management Policies 2006* (NPS 2006) and associated Director's Orders direct management of natural and cultural resources, the Yosemite Wilderness, and visitor use; the policies also address development of visitor and park facilities. The *Merced River Plan* complies with all these laws and policies.

None of the *Merced River Plan/DEIS* alternatives would fundamentally affect land use within the river corridor. Under each of the alternatives, opportunities for both day and overnight recreational use would be retained. The character of the recreational use would differ under the various alternatives (for example, visitors would need to be more self sufficient under Alternative 2). However, all of the alternatives would continue existing land use under guidance of the laws, policies, and plans listed above. The changes in the character of recreational use that would occur under some alternatives are addressed under the "Visitor Experience" subsection analysis later in this chapter.

### ***Museum Collections and Objects***

The Yosemite Museum collection is not presented as a separate topic because the *Merced River Plan* does not specifically call for any data collection activities. Future projects undertaken in the river corridor could require data collection. Any effect from these projects on the Yosemite Museum collection would be addressed within project-specific compliance documents.

### ***Cumulative Impacts***

The environmental consequences sections also include a discussion of the *cumulative impacts*, which considers the *Merced River Plan/DEIS* in the context of other past, current, or proposed projects in the area. A cumulative impact is described in regulations developed by the CEQ (CEQ regulation 1508.7), as follows:

*A “Cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

Appendix B contains the list of past, present, and reasonably foreseeable actions considered in the cumulative impacts analysis. These cumulative actions are evaluated in conjunction with the impacts of an alternative to determine whether they would have additive effects on a particular resource or value.

General guidance and methodologies for the cumulative impacts analysis in this document follow those published by the CEQ (CEQ 1997). Cumulative impacts have been analyzed for each alternative, and are included under each analysis topic. The methodology for defining the context, intensity, duration, and type of cumulative impacts is the same as that described for evaluating impacts under the NEPA, above.

## Impairment

In addition to determining the environmental consequences of the alternatives, *NPS Management Policies 2006* (NPS 2006) and NPS Director’s Order 12 require analysis of potential effects to determine if actions would impair park resources and values. Following all public review and after conclusion of the no-action period, the evaluation determination of no impairment for the selected alternative will be described documented in an Attachment to the Record of Decision for the Merced River Plan/DEIS FEIS.

## Mitigation

The NPS places a strong emphasis on avoidance, minimization, and mitigation of impacts to help ensure that the activities associated with the *Merced River Plan* will protect park resources and the quality of the visitor experience. Mitigation measures include the following types of actions:

- Avoid conducting management activities that would adversely affect the resource.
- Minimize the type, duration, or intensity of the impact on an affected resource.
- Repair localized damage to the affected resource immediately after an adverse impact.
- Rehabilitate an affected resource with a combination of additional management activities.
- Compensate a long-term, major, adverse direct impact through additional strategies designed to improve an affected resource to the degree practicable.
- Recover important scientific or other data that may be lost from archaeological sites.
- Specific mitigation measures that would occur prior to, during, and after construction under all action alternatives are described in Appendix C.

## **The No Action Alternative Analysis**

The No Action alternative represents the current management direction for the Merced River corridor, as modified by the settlement agreement (see Chapter 2). It provides a baseline from which to compare other alternatives, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes. Pursuant to the settlement agreement, the Merced River corridor is measured as an average of not more than 320 acres of land per mile, measured from the ordinary high-water mark on both sides of the river, which sets up a protection buffer of about 0.25 mile on each side of the river (or a total corridor width of 0.5 mile). Boundaries and classifications of the river segments are discussed in Chapter 3.

## ANALYSIS TOPICS: NATURAL RESOURCES

### Geology, Geohazards, and Soils

#### *Affected Environment*

##### **Regulatory Framework**

The National Park Service (NPS) has several guiding principles with respect to the management of geologic resources. Geologic resources include geologic processes, shorelines, hazards, and unique geologic features. These guidelines are specified in the *NPS Management Policies 2006*. That document specifies that the NPS will, at a minimum: (1) assess the impacts of natural processes and human activities on geologic resources, (2) maintain and restore the integrity of existing geologic resources, (3) integrate geologic resource management into NPS operations and planning, and (4) interpret geologic resources for park visitors (NPS 2006a, section 4.8.1, 53). With a few exceptions, the management policies generally direct the NPS to allow natural geologic processes to proceed unimpeded; facilitate the continuance of natural shoreline processes; and protect geologic resources from human-induced impacts while minimizing the potential impacts of geohazards on visitors, staff, and developed areas (NPS 2006a).

##### ***Yosemite Valley Geologic Hazard Guidelines Summary***

The 2012 Yosemite Valley Geologic Hazard Guidelines was developed by the NPS in response to advances in the scientific understanding of rock fall mechanisms, frequency and magnitude, and the recent release of a quantitative rock-fall hazard and risk assessment for Yosemite Valley (Stock et al. 2012b). This recently released study used a quantitative approach to establish a rock fall hazard line within Yosemite Valley, which was drawn to encompass 90 percent of the boulders that have fallen from the valley walls beyond the base of the talus (the zone of boulder accumulation). The position of the line was then adjusted inward or outward based on knowledge of: (1) past rock fall frequency derived from cosmogenic exposure dating of outlying boulders, combined with (2) estimates of future rock fall frequency using a 3-dimensional program (STONE) that simulates rock fall runout. The result of the adjusted hazard line is that areas beyond the rock fall hazard line have a 0.2% probability of boulder deposition in a given year, or a 10% probability of occurrence in 50 years. The study is the first to quantitatively evaluate rock fall hazards using spatial probability mapping that is similar to other, more common hazard maps, such as FEMA flood hazard zones and USGS maps of peak ground acceleration. The risk assessment then evaluated the occupancy of structures (in terms of number of occupants and the occupancy rate) within the rock fall hazard line so that structures could be assigned a risk metric, and be ordered by level of risk.

The quantitative rock-fall hazard and risk assessment for Yosemite Valley has allowed NPS managers to quantify the level of risk that was reduced by the 2008 closure of structures in Curry Village cabins (the action reduced the overall risk associated with structures in Yosemite Valley by at least 87 percent). It also allows NPS managers to form a rock fall hazard policy for the park that has a sound scientific basis. The 2012 Yosemite Valley Geologic Hazard Guidelines presents a comprehensive

policy direction for existing structures within the rock fall hazard line, based on their risk metric. In short, the policy establishes three classes of existing structures, from highest risk metric (i.e., above 6) to lowest risk metric (i.e., below 4); establishes a corresponding level of priority for removal, change of use, or repurpose; and outlines other important issues to be considered such as the importance of the structure's function and/or its historical status.

Importantly, under the new guidelines, the NPS has disallowed the placement all new structures or facilities within the rock fall hazard zone unless the facility is deemed critical, no practicable alternative exists, and life and safety risks to humans is low (e.g., a utility building). In cases where exceptions are made, the NPS commits to conducting a detailed project-specific hazard assessment. The geologic hazard guidelines also outline acceptable practices for siting of roads and trails, and placement of warning and/or closure signs.

### ***Soil Resources Policy***

The management of soil resources is described in the *NPS Management Policies 2006* and *Natural Resource Management Reference Manual #77*. These documents specify that the NPS will protect soil resources by preventing — or at least minimizing — adverse, potentially irreversible impacts on soils (NPS 2006a, section 4.8.2, 4).

### **Geology**

Yosemite National Park occupies approximately 1,170 square miles in the central portion of the Sierra Nevada. The Sierra Nevada is the highest and most continuous mountain range in California. The range is generally asymmetrical, with a gentle west slope and a steep east escarpment. Elevations approach sea level on the western side and reach about 14,000 feet above mean sea level at the crest.

The Sierra Nevada is essentially an uplifted block of the earth's crust that was tilted westward by normal faults on the eastern boundary. Granitic bedrock is widespread in Yosemite National Park and dominates a significant portion of the Sierra Nevada. The granitic rock formed deep in the earth as plutons of melted rock. About 100 million years ago, as the granitic rocks were formed, heated, and melted, they slowly migrated toward the earth's surface and began to cool, forming a subsurface body of solidified granitic rock called a batholith.

Between 100 million years ago and 65 million years ago, magma formation slowed and a long period of erosion began in the Sierra Nevada. Erosion removed the overlying rocks and exposed the underlying core of the granitic batholith. Eroded material was transported westward and filled the present-day Central Valley with deposits that are tens of thousands of feet thick. About 15 million years ago, the relief of the Sierra Nevada in the Yosemite region had gently rolling upland topography and a much lower elevation than the present-day range. The Merced River flowed westward at a gentle gradient through a broad river valley. Volcanic activity, prevalent in the northern Sierra Nevada from about 38 to 10 million years ago, deposited ash, filled valleys, buried streams, and altered river courses.



Mountain-building activity was reactivated about 25 to 15 million years ago, uplifting and tilting the Sierra Nevada to form its relatively gentle western slope and the more dramatic, steep eastern slopes. The uplift increased the gradients of the rivers and resulted in deeply incised river valleys.

Between 3 million years ago and 2 million years ago, snow and ice accumulated as glaciers at the higher alpine elevations and began to move westward down the mountain valleys. At least three major glacial periods occurred during the ice age in the Sierra Nevada and are known as the Pre-Tahoe (oldest), the Tahoe (intermediate), and the Tioga (youngest). The downslope movement of the ice masses cut and sculpted the valleys, cirques, and other glacially formed landforms throughout the Yosemite region and the Sierra Nevada. The depositional and erosional glacial features viewed today in Yosemite are primarily the result of the Tioga event, though the cumulative effects of the previous glaciations are responsible for the overall shape and character of the region.

The Tioga was the last glaciation event and began as late as 60,000 years ago, when the climate cooled sufficiently to allow small glaciers to form on erosional features sculpted by earlier glaciers. Throughout this period in the Yosemite area, the ice field grew and pushed fingers of ice into the major drainages on the west slopes, until it reached its maximum extent about 20,000 years ago. The Tioga glacier extended westward as far as Bridalveil Meadow and, when it receded, left behind features such as erratics (boulders carried by glacial ice), glacial till (rock debris transported by glaciers), and moraines. The Tioga glacial event left the landscape scoured and small basins filled with silt and sediment (Huber 1989).

### ***Bedrock of Yosemite***

Granitic and metamorphic rocks dominate Yosemite National Park, with the granitic rocks being most abundant and metamorphic rocks constituting less than 5% of the area in the park (Huber 1989). The metamorphic rocks represent the older rock that the granitic plutons intruded. Granitic rocks form from the cooling and solidification of molten rock in the earth's crust.

The granitic batholith of Yosemite National Park is not monolithic, but rather was formed through a series of intrusive events over a period of 130 million years. The separate episodes of intrusion and solidification formed more than 100 discrete plutonic masses, making up several granitic rock types. The particular type of granitic rock is distinguishable by the varying mineral composition, texture, and percentages of primary minerals. Granitic rocks in Yosemite National Park include granite, granodiorite, and tonalite (Bateman 1992). **Figure 9-1** presents a longitudinal profile along the main stem and south fork of the Merced River, showing the major granitic intrusive suites, as well as the areas of metamorphic bedrock underlying the river corridor (SCS 2007). **Figure 9-2** shows representative valley cross sections of four different locations along the river that have different valley shapes (including the U-shaped valley on the upper Merced River and the V-shaped canyon of the Merced River Gorge).

### ***Segment 1: Merced River Above Nevada Fall — Geology***

The upper reaches of the main stem of the Merced River are dominated by the interaction of a wild river flowing through granitic landscapes. This glaciated canyon is narrow, with steep gradients in some areas, and wider in other areas where the river flows at a gradual slope and forms a floodplain.

This textbook example of a glacier-carved canyon has been identified as a feature of the geologic outstandingly remarkable value (ORV).

The width of the river valley can range from 960 feet in the narrower, steeper sections to 2,600 feet in the wider areas. The Bunnell Cascades is an example of steep gradient flow in a relatively steep canyon; the Merced River through Little Yosemite Valley exemplifies a river flowing on a wider floodplain.

### ***Segment 2: Yosemite Valley — Geology***

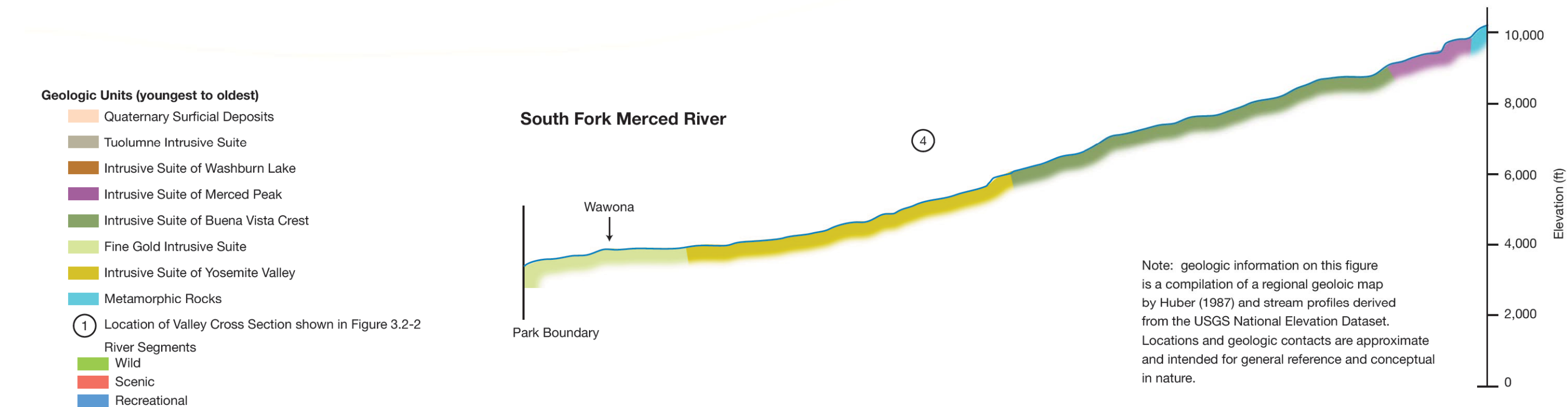
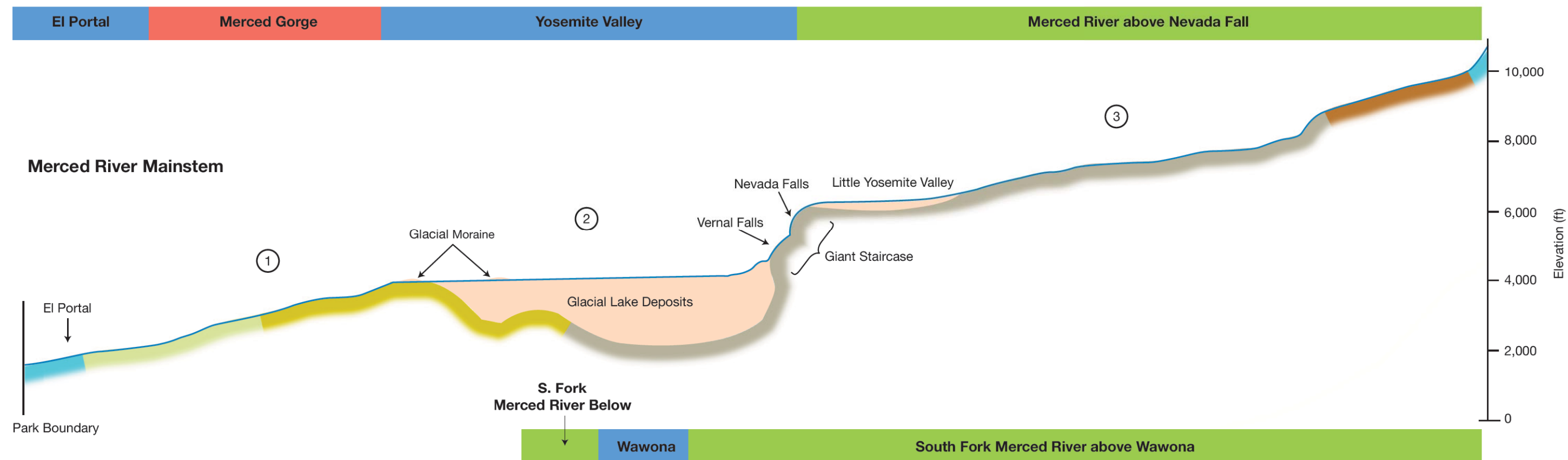
Yosemite Valley is primarily composed of granite and is glacially carved, with its floor ranging from 3,800 to 4,200 feet above sea level. The valley is oriented in an east-west direction, and its sides rise 1,500 feet to 4,000 feet above the essentially flat valley floor. Yosemite Valley — not including Tenaya Canyon or Little Yosemite Valley — is about 6.8 miles long and varies from a little under 0.5 mile wide to around 0.75 mile wide. The east valley branches into the Tenaya Canyon to the north and the Little Yosemite Valley to the south.

The downslope movement of the ice masses cut and sculpted the U-shaped valley that is present today (figure 9-2). Combined actions of these glaciers and local differences in the resistance of underlying granite rock to erosion resulted in the creation of what is known today as the Giant Staircase (figure 9-1). This geologic display includes the formations underlying Vernal Fall and Nevada Fall, and constitutes one of the finest examples of stair-step morphology in the country. Consequently, the Giant Staircase is considered one of the Merced River's geologic ORVs.

When glaciers melt, the rock debris they transport (till) is deposited in ridge-shaped landforms known as moraines. A *medial* moraine at the east end of Yosemite Valley was created when glaciers extending from Upper Merced and Tenaya canyons merged at the confluence of the two canyons. Two other prominent moraines were formed in Yosemite Valley after the last glacier (the Tioga) retreated about 15,000 years ago. A *terminal* moraine, marking the furthest extent of the glacier, lies just east of Bridalveil Meadow. The El Capitan moraine, lying further east, is a *recessional* moraine, formed after the leading edge of the glacier retreated up the valley from its farthest extent. The locations of these two moraines are shown in figure 9-1. After the last glacier melted, water flow dammed morainal material to form what is now referred to as the prehistoric Lake Yosemite (Matthes 1930). Stream deposits then filled in Lake Yosemite, adding to the 2,000-foot-thick sediment that underlies the present-day floor of Yosemite Valley and covers the glacially eroded granite rock below (Glazner and Stock 2010). The El Capitan recessional moraine has been identified as a feature of the geologic ORV.

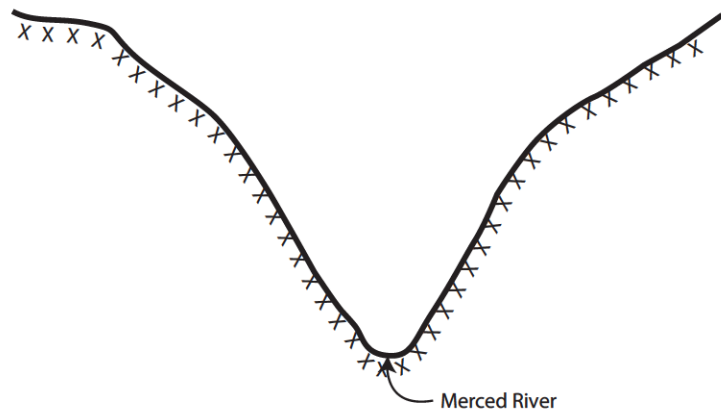
### ***Segments 3 and 4: Merced Gorge and El Portal — Geology***

The Merced River Gorge begins at the west end of Yosemite Valley, where the gradient of the Merced River abruptly increases and the river enters the canyon. The gorge has remained an incised, V-shaped feature because the most recent glacial events did not extend down the Merced River beyond Yosemite Valley (figure 9-2). The granitic rocks in the Merced Gorge consist primarily of tonalite; the Bass Lake tonalite is the dominant bedrock feature. Among some of the oldest rocks found in the Sierra Nevada are those just east of and surrounding El Portal, in the walls of the Merced River canyon. These rocks are metamorphic and remnants of ancient sedimentary and volcanic rocks that

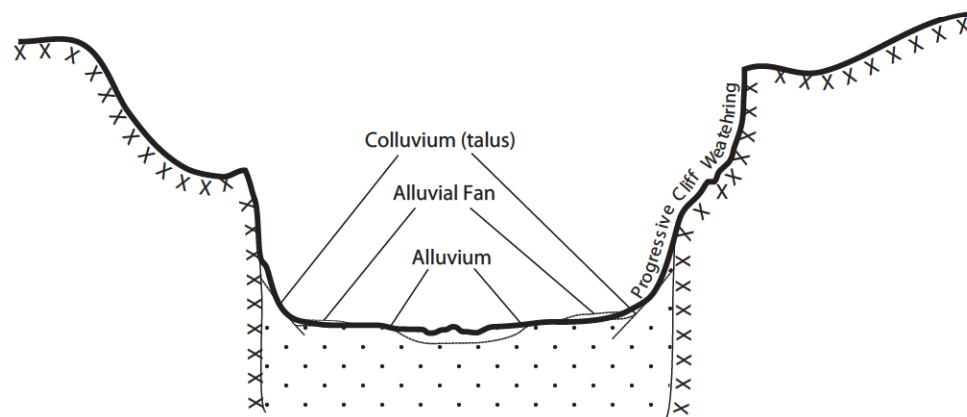


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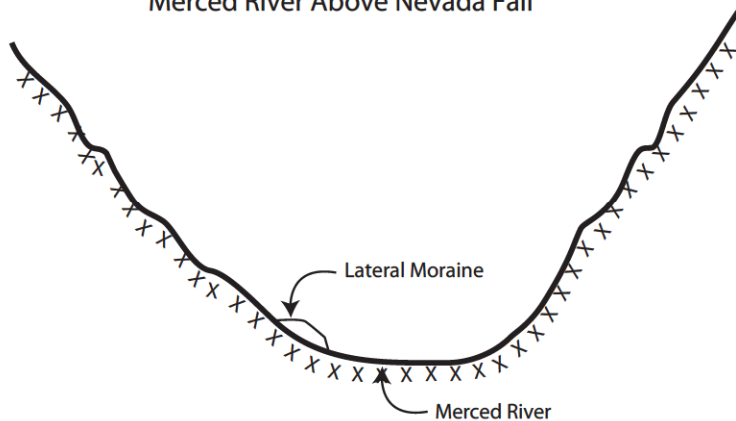
① V-Shaped Canyon of the Merced River Gorge



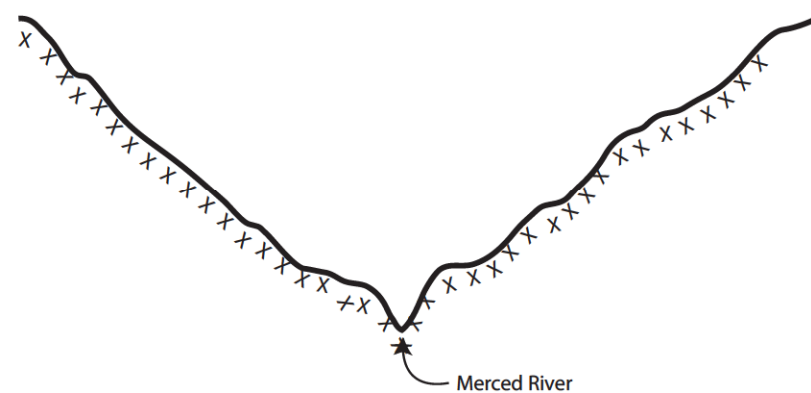
② Sediment-Filled Valley of Yosemite Valley



③ U-Shaped Valley of the Merced River Above Nevada Fall



④ Valley Cross Section of the South Fork Merced River



Note: Not to Scale

were deformed and metamorphosed, in part by granitic intrusions (Huber 1989). This metamorphosed sedimentary rock (which includes banded chert) was once part of the ocean floor that covered the region about 200 million years ago (Huber 1989).

When the slope of river gradients get less steep, rivers lose the energy needed to transport large sediments and boulders. In such areas, bar-type deposits — such as the large boulder bar at the east end of El Portal — are built up. This rare boulder bar contains massive boulders measuring over a meter in diameter and weighing many tons. It is the combination of boulder availability, the steepness of the Merced River in the canyon, the major change in gradient and valley width at El Portal, and the size of the river's peak floods that enables the river to create such a boulder bar. This unique combination of factors has contributed to the boulder bar's designation a geologic ORV. As illustrated by the January 1997 flood, the Merced River continues to sort and build this bar, providing evidence in all seasons of the river's potential erosional and depositional ability.

### *Segments 5, 6, 7, and 8: South Fork Merced River — Geology*

While there are no geologic ORVs or geologic management measures identified for Segments 5, 6, 7, or 8, a brief description of geology is nonetheless provided here for background. From its headwaters, the South Fork Merced River flows west at a relatively consistent gradient through a glaciated alpine environment and then enters a V-shaped, unglaciated river canyon below Wawona. Glaciation sculpted the upper reaches of the South Fork Merced River. Compared with the main stem, there is more variation of the bedrock regime along the South Fork Merced River. At the headwaters, the South Fork Merced River is in contact with metamorphic volcanic rocks, including ash flow deposits. As it flows westward, the South Fork Merced River contacts granitic rocks, metamorphic rocks near Gravelly Ford, and granite (similar to that found in Yosemite Valley) 8 miles east of Wawona. The geology west of Wawona in park boundaries is composed of the Fine Gold Intrusive Suite (i.e., granitic rocks). Wawona Dome, visible from the river, is an exfoliating granite dome with an elevation of approximately 6,900 feet above sea level. Upon entering Wawona, the South Fork Merced River cuts through the tonalite, a predominant granitic rock found along the southwest boundary of the park. The riverbed remains within tonalite, except for a short section underlain by metamorphic rocks near the park boundary. These rocks are among the oldest exposed along the South Fork Merced River.

### **Geohazards**

The Merced River flows through geologically active areas, where geologic and hydrologic forces continue to shape the landform. Geologic hazards associated with these forces, such as earthquakes and rock falls, present potentially harmful conditions to visitors, personnel, and facilities in Yosemite National Park.

### *Regional Seismicity*

The Sierra Nevada range of Yosemite National Park is not considered an area of particularly high seismic activity. No active or potentially active faults have been identified in the mountain region of the park (CDMG 1997). However, Yosemite can undergo seismic shaking associated with earthquakes on fault zones on the east and west margins of the Sierra Nevada range, as it has done in the past.



These fault zones include the Foothills fault zone to the west, the volcanically active area in the Mono Craters-Long Valley Caldera area to the east, and the various faults in the Owens Valley fault zone, also to the east (CDMG 1996).

The Foothills fault zone, which includes the Melones Fault and Bear Mountain Fault, extends in a north-south direction in the foothills of the Sierra Nevada, approximately 30–50 miles west of Yosemite Valley. This fault zone has not experienced movement in the last 2 million years and thus is not considered active or potentially active (CDMG 1996).

The Mono Lake fault is located approximately 35 miles northeast of Yosemite Valley in the Mono Craters-Long Valley Caldera region. Since 1980, this area has experienced considerable seismic activity. Earthquakes have been attributed to movement on the Mono Lake fault (Sierra Nevada frontal fault) and movement associated with resurgent volcanic activity of the Long Valley Caldera. The Mono Craters last erupted 600 years ago. A 5.7-magnitude earthquake on the Mono Lake fault in October 1990 was felt as far west as Sacramento and the San Francisco Bay Area and caused landslides and rock falls at Tioga Pass and on the Big Oak Flat Road (McNutt et al. 1991). In September 2004, a swarm of earthquakes, with two greater than magnitude 5, occurred in the Adobe Hills north of Long Valley and just east of Mono Lake; the epicenter of the swarm is in the vicinity of the Hunton Valley fault system (CISN 2004).

The Owens Valley fault, located approximately 100 miles southeast of Yosemite Valley, has experienced movement in the last 200 years, and the California Geological Survey considers this fault active (CDMG 1997). The most notable earthquake felt in Yosemite National Park was the Owens Valley earthquake of March 26, 1872. The Owens Valley earthquake is estimated to have had a magnitude of 7.6 and was one of the largest earthquakes in U.S. history (Ellsworth 1990). This earthquake reportedly caused damage in the Sacramento and San Joaquin valleys and caused significant rock falls in Yosemite Valley (Wieczorek and Snyder 2004).

Although earthquakes that are felt by people in Yosemite National Park are relatively infrequent, they have occurred in the past and would likely occur in the future. Ground shaking typically is expressed in terms of peak ground acceleration as a percent of 1 g (g is acceleration due to gravity, or 980 centimeters — 32 feet — per second squared). The peak accelerations estimated in the Yosemite National Park region of the Sierra Nevada are between 0.1 and 0.2 g (CDMG 1999). Most people would likely feel this range of ground shaking, but structural damage would be negligible to slight in buildings constructed according to modern building standards.

### ***Rock fall***

Rock fall refers here to all slope movement processes, including rock fall, rockslide, debris slide, debris flow, debris slump, and earth slump. Rock falls that displace extremely large and catastrophic volumes of rock, referred to as rock avalanches, are rare events. Only six large rock avalanches— such as the prehistoric Mirror Lake and El Capitan rock avalanches discussed below — have occurred in Yosemite Valley in the past approximately 15,000 years (Wieczorek et al. 1998, 1999). However, many smaller rock falls occur yearly or seasonally, and can often go unnoticed when they occur far away from developed facilities in Yosemite NP (Wieczorek et al. 1998).

Rock falls can occur as a result of such processes as infiltration of water, the expansion and contraction of rock cause by diurnal and seasonal temperature variations, seismic shaking, or exfoliation. The processes cause concentric granitic plates, ranging in size from inches to several feet, to become dislodged from a granite cliff face. Many rock falls are associated with triggering events, such as earthquakes, rainstorms, or periods of warming that produce a rapid melting of snow. The magnitude and proximity of the earthquake, intensity and duration of the rainfall, and the thickness of the snowpack in relation to the pattern of warming all influence the triggering of rock falls. In a study of rock hazards, climatic factors (winter storms) were determined to be the most common trigger of rock fall (Wieczorak and Jaeger 1996). A more subtle trigger is the expansion and contraction that is caused by alternating freezing and thawing of water in the cracks of Yosemite's cliffs. This action weakens its structure and results in periodic rock falls. Rock falls that occur without a direct correlation to an obvious triggering event are probably associated with freeze/thaw action or the gradual stress release and exfoliation of the granitic rocks (Wieczorek et al. 1998).

**Prehistoric Events.** Rocks have become dislodged and fallen off the sheer granite cliffs throughout the geologic history of Yosemite. Evidence for past rock fall events in Yosemite can be traced back to the end of the last glaciation (Tioga). The retreat of the Tioga glacier left behind a Yosemite Valley that was relatively flat and free of talus, and provided for baseline conditions from which post-glacial rock falls could be measured (Stock et al. 2012b).<sup>1</sup> Over time, rock fall events ranging in size from small individual blocks of less than 1 cubic meter to rock avalanches of several million cubic meters resulted in abundant talus deposits at the base of almost all of the walls of Yosemite Valley. In some places, the extent of talus around the edge of the valley is estimated to be greater than 300 feet thick (Wieczorek and Jaeger 1996). Some of the larger prehistoric rock falls, such as the El Capitan and Mirror Lake rock avalanches, involved millions of cubic meters of rock and were sizable enough to have significantly altered the course of the Merced River (i.e., through full or partial damming of the river corridor). The El Capitan rock avalanche was so large that talus deposits extend more than 1,400 feet from the base of the wall across the valley floor.

**Historic Events.** One of the earliest historical descriptions of a rock fall event comes from famed writer and naturalist John Muir. Muir was in Yosemite Valley when the 1872 Owens Valley earthquake occurred:

The Eagle Rock, a short distance up the valley, had given way, and I saw it falling in thousands of the great boulders I had been studying so long, pouring to the valley floor in a free curve luminous from friction, making a terribly sublime and beautiful spectacle—an arc of fire fifteen hundred feet span, as true in form and as steady as a rainbow, in the midst of stupendous roaring rock storm.

A database of historical rock fall and other slope movement events indicates that between 1857 and 2011, more than 910 events were recorded in Yosemite National Park (Stock et al. 2012a). A majority of these events were smaller, fragmental rock falls.

**Current Frequency.** The highest frequency of slope movements occur during the wetter and colder part of the year, mostly from November through April. Based on recent documentation (2006–2011),

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<sup>1</sup> Talus refers to the accumulation of rock-fall generated boulders at the base of steep cliffs.

on average, approximately one rock fall occurs each week in Yosemite Valley, and a rock fall of approximately 10,000 cubic meters occurs each year (Stock et al. 2012b, Wieczorek 2002).

Hazards. Larger rock falls, though less common, may result in sudden wind gusts associated with large slabs of rock hitting the ground, which pose potential threats to human safety and possible property damage. Between 1857 and 2011, there were 15 fatalities and at least 85 injuries in Yosemite Valley from rock falls and other slope movement events (Stock et al. 2012b). Rock falls can also result in the damage and destruction of roads, trails, and buildings. Examples of such rock falls include the 1987 Middle Brother rock fall, the 1996 Happy Isles rock fall, the 1998–1999 Curry Village rock falls, and the 2008 Glacier Point rock falls. The 2008 Glacier Point rock fall, which represents Yosemite’s most damaging historical event with regard to infrastructure, led the NPS to permanently close more than 200 buildings in the Curry Village area (Stock et al. 2012b).

### ***Segments 1 and 2: Merced River above Nevada Fall and Yosemite Valley — Geohazards***

Yosemite Valley is in the upper or middle portion of the canyon of the Merced River, which was deepened by several episodes of glacial erosion. The most recent Tioga glaciation extended east of Bridalveil Meadow, where the Merced River now meanders across the relatively flat valley. Except for large rock avalanches, the talus from rock fall and rockslide deposits seldom reaches the center of the valley. However, debris flows (which are very fluid in nature) can carry boulder debris far into the valley, even on moderately gentle slopes. Yosemite Valley narrows to the west of Bridalveil Meadow, and talus from rock falls and rockslides extends from the cliffs down to the banks of the Merced River.

Accumulating talus, ranging in size from small rocks to large boulders, forms slopes at the base of the sheer rock cliffs at the valley edge. The rock falls and associated talus slopes contribute to the natural topography and to the formation of soils on the valley floor. Rock falls from the sheer valley walls have, over time, created talus cones of debris spreading away from the edges of the cliffs. While the main mass of the rock falls have remained in the talus zone, air blasts and fly-rock (i.e., individual rocks and boulders projected further out from the main slide mass) have occasionally extended further into the center of the valley, causing one fatality, several serious injuries, and damage to park facilities (Wieczorek et al. 2000, Wieczorek et al. 2008).

To assess the risk of rock fall hazards in Yosemite Valley, Stock et al. (2012b) determined the likelihood of persons and/or structures being struck by boulders, including areas near the talus slopes and the adjacent outlying boulder zones. This rock-fall hazard zone is based on (1) observable, measurable evidence of previous rock falls in the form of the spatial distribution of outlying boulders; (2) the frequency of occurrence of outlying boulder deposition; and (3) simulated trajectories of potential future rock falls from computer modeling (Stock et al. 2012b). Stock et al. (2012b) used a statistical approach to develop a probabilistic rock-fall hazard line on the floor of Yosemite Valley. The line represents an approximately 1/500 annual exceedance probability, or put another way, an approximate 10% chance of a boulder going beyond the line in a 50-year period. In general, the limits of the rock-fall hazard zone (i.e., the 90th-percentile distances of outlying boulders) for the study regions range from 7 to 57 meters beyond the mapped base of talus slopes. The subsequent risk assessment focused on the inventory of buildings, structures, and other facilities, such as campsites, lodges, and amphitheaters, in the hazard zone where people congregate.

According to the risk assessment, following the 2008 closures of structures and lodging at Curry Village, the overall risk of casualties and structural damage from rock falls in Yosemite Valley was reduced by at least 87%. The 2008 closures in the Curry Village focused on areas determined to be at greatest risk at the time, but did not close all the visitor lodging and concessioner housing within the newly-established rock fall hazard line. Risks to people and structures from rock fall remains highest in Curry Village (including the concessioner residential area) which accounts for over half of the overall risk of casualties and structural damage from rock falls in Yosemite Valley. However, areas of significant risk also include (from greatest to least risk), (1) the tent cabins and campsites in the Camp 4 area, (2) the LeConte Memorial Lodge & Housekeeping Camp, and the (3) NPS housing and operations area in the northern portion of Yosemite Village.

In response to rock fall hazards, the NPS has developed the 2012 Yosemite Valley Geologic Hazard Guidelines with the intent of better protecting park visitors and staff by closing existing facilities under high risk and avoiding placement of new facilities in areas with a high potential for rock fall impact.

### *Segments 3 and 4: Merced Gorge and El Portal*

Significant incision of the Merced River has created the present-day relief of the canyon and a change of gradient of over 2,000 feet in just over 7 miles between Pohono Bridge to the park boundary. The canyon area has had many rock fall incidences, including rock falls that have occurred along El Portal Road. Of the 519 historical rock falls discussed above, most of the approximately 164 rock falls that did not occur in Yosemite Valley occurred in areas along El Portal Road in the Merced River Gorge (Stock et al. 2012a). The high incidence of rock falls is partly due to the steep, narrow configuration of the gorge, riverbank undercutting, and such historic human activity as the construction of El Portal Road. These events have been well documented (Wieczorek and Snyder 2004) and provide information regarding historic rockslide hazards along the Merced River Gorge and in areas where unstable rock slopes are known to pose a risk of future rock fall events. Rock-fall hazards are somewhat lower in the Merced River Canyon at El Portal compared to those in the Merced River Gorge, due to the generally lower angled slopes surrounding El Portal. Nevertheless, there are some areas of cliffs that are susceptible to rock fall events, especially on cliffs composed of highly fractured granitic and metamorphic rocks. Hazards associated with seismic groundshaking would affect El Portal in the same way they would the Merced River Gorge and elsewhere in Yosemite National Park.

### *Segments 5, 6, 7, and 8: South Fork Merced River — Geohazards*

As shown in figure 9-2, the South Fork Merced River, from the headwaters to the park boundary west of Wawona, is characterized by considerably less steep valley cross sections compared with the Merced River Gorge (Segment 3) and Yosemite Valley (Segment 2). Nevertheless, the primary geologic hazard present along these segments remains the threat of rock falls and debris flows or slides. Such hazards would be more likely close to steep slopes and could occur anywhere along the side-slopes of the Merced River corridor. Although less data has been collected regarding the occurrence of historic rock falls along the South Fork Merced River as compared with the main stem, given the similar underlying geology and less steep topography, the frequency and magnitude of slope failures is lower compared with the other river segments.

## **Soils**

All soils form as a result of the combined effect of several factors, including geologic parent material, climate, biologic activity, topographic position/relief, and time. In the park, topography is the most important factor contributing to soil differentiation. Topography influences surface runoff, groundwater, the distribution of stony soils, the separation of various-age alluvial soils, and the extent of glaciation, which exerts a first-order control on soil development and age (SCS 2007). More than 50 soil types are found in the park; general or local variations are the result of glacial history, microclimatic differences, and the ongoing influences of weathering and stream erosion/deposition (SCS 2007).

Soils of the Yosemite region are primarily derived from underlying granitic bedrock and are of similar chemical and mineralogical composition. Except for meadow soils, most soils above 6,000 feet are developed in glacial material (glacial soils) or developed in place from bedrock (residual soils). Glacial soils consist of a mixture of fine sand, glacial flour, and various-size pebbles and boulders (SCS 2007). Alluvial soils are developed along streams through erosion and deposition and tend to have sorted horizons of sandy material. Weathering processes break down talus to smaller-size particles that are then transported by water and eventually become deposited in alluvial fans or in stream channels. Various areas of Yosemite National Park have meadow soils consisting of accumulated clays, silts, and organic debris that are subjected to occasional flooding. Colluvial soils have developed along the edges of cliffs where landslides and rockslides have occurred and are composed of various-size rocks that have high rates of infiltration and permeability. The surface soil in Yosemite Valley, for instance, consists primarily of granitic sands in various stages of decomposition (SCS 2007).

Local moisture and drainage influence the organic content of the upper soil profile. Thick sedges and grasses have significantly contributed to the organic content of soils near ponds, lakes, and streams. Coniferous forest soils have a high organic content and are relatively acidic. Soils lacking organic accumulations are frequently a result of granitic weathering, consist largely of sand, and support only scattered plants tolerant of drought conditions (SCS 2007).

### ***Segment 1: Merced River Above Nevada Fall – Soils***

Although soils in the upper main stem of the Merced River have not been examined in as much detail as those in the Yosemite Valley region, they are similar in chemical and mineralogical composition. Glacial history, weathering, fluvial process, and erosion contribute to the local variations in soil compositions. High country soils (excluding meadow soils) are typically glacial or residual, and alluvial soils can be found near streams. Glacial moraines and deposits cover areas above 6,000 feet.

### ***Segment 2: Yosemite Valley — Soils***

Most of Yosemite Valley is an active floodplain of the Merced River. During Merced River flood events, alluvial soils are formed and removed as floodwaters deposit and erode material over the floodplain. The active flooding builds river terraces of fine- to coarse-textured sands. Old riverbeds of boulders and gravel may be buried under the terrace soils. Residual soils are scattered throughout Yosemite Valley where bedrock weathering has occurred. Glacial soils are associated principally with moraines. Colluvial soils have developed on the talus slopes along the edges of the valley floor. Valley

soil textures vary from fine sand to fine gravel. Most soils have a relatively undeveloped profile, indicating their relatively recent origin and young geologic age.

The Natural Resource Conservation Service identified 21 soil series/types in Yosemite Valley (SCS 2007). Each soil type has specific characteristics that influence plant growth, water movement, and land use capabilities, among other factors. Land use limitations are commonly associated with frequent flooding, a seasonally high water table, poor drainage, steep slopes, high rock concentration, and a poor soil structure. The El Capitan fine-sandy loam, found in and around El Capitan Meadow, is an example of a Yosemite Valley soil with physical constraints that limit land use due to occasional flooding.

#### *Segments 3 and 4: Merced Gorge and El Portal — Soils*

The soils in relatively flat portions of the Merced River Canyon at El Portal form from glacial and alluvial sediment deposition along the Merced River corridor, or from hillslope and colluvial deposition occurring locally near the base of canyon slopes near El Portal. The Merced Gorge, due to its narrow and steep shape, and the high energy flows of the Merced River, consists of boulders and cobbles, and generally does not support stable sedimentary deposits, or mature and fine-grained soils.

#### *Segments 5, 6, 7, and 8: South Fork Merced River — Soils*

Soils in the upper reaches of the South Fork Merced River are similar in chemical and mineralogical composition to those in the upper Merced River. Parent rock type, glacial history, weathering, fluvial process, and erosion contribute to the local variations in soil compositions. High country soils (excluding meadow soils) are typically glacial or residual, and alluvial soils typically form near streams.

Soils of the Wawona area are primarily residual on slopes and alluvial along the South Fork Merced River. Soil depth varies from 2 to 4 feet above bedrock; these soils are moderately to strongly acidic. The major soil types are mixtures of loam, sand, and silt, and are distinguished by the amount and type of rock fragments. Noted above, most soils are subject to erosion after disturbance or loss of vegetative cover. Such is the case at the Wawona Picnic Area and around the Wawona Campground, where heavy use along the South Fork Merced River is resulting in vegetation trampling and riverbank erosion.

### *Environmental Consequences Methodology*

The potential for impacts on geology and geologic features, including those identified as geologic/hydrologic ORVs, is considered negligible to nonexistent. Thus, impacts on geology and geologic features are not evaluated. This impact assessment considers the potential effects that geologic processes (i.e., geohazards) could have on visitors, employees, and facilities. It also considers the impact on sensitive soil resources (meadow and riparian soils).

Several assumptions regarding facility placement, geologic design parameters, and public safety were integrated into this assessment, as summarized below.



- Facility design would conform to the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2 only) and accepted building codes regarding seismic design parameters (in all segments).
- The potential for adverse impacts on life and property resulting from geologic hazards will always be present in Yosemite National Park.
- In the event of a rock fall, the NPS could close the affected area to protect visitor and employee safety. Rocks on roads would be removed, but rock fall talus in rivers would not be removed unless the talus dammed the river and flooding threatened utilities or facilities.

Potential impacts of each alternative are evaluated in terms of the context, intensity, and duration, as well as whether the impacts were considered beneficial or adverse with regard to soils, or public or facility safety.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area in a designated segment of the river (i.e., 1–8). This analysis will further identify whether there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts in a single segment, or larger scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the project area in Yosemite National Park. Regional impacts would extend to the Sierra Nevada as a whole.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major.
  - **Seismic Hazards and Rock falls.** Negligible impacts were effects considered not detectable and would have no discernible effect on park facilities or public safety. Minor impacts were those that would be present but not expected to have an overall effect on park facilities or public safety. Moderate impacts would be clearly detectable, and could have an appreciable effect on park facilities or public safety. Major impacts would have a highly noticeable influence on park facilities or public safety. The intensity of impacts for each alternative with respect to geohazards is determined relative to the existing levels of risk.
  - **Soil Resources.** Impacts on soil resources consider the effects of park visitation and stock use (i.e., soil compaction and trampling) on a soil's function, integrity, and ability to support native plant growth. Mapping of compacted soils, bare ground, informal trails, and evidence of pack stock use, which was performed by the NPS (2011) and Cardno Entrix (2011), was used as the basis for identifying the intensity of existing impacts on soil resources. These studies focused on meadow and riparian soils considered most sensitive to human disturbance and compaction. In assessing impact intensities, it was assumed that Alternative 1 would result in the same or slightly greater impacts relative to existing conditions because park visitation is expected to continue at existing levels; and permits, quotas, and group size limitations for recreational activities would remain unchanged.

In this analysis, negligible adverse impacts were identified in areas where human visitation and pack stock use occur, but where there would be no evidence of reduced soil function and where soils would continue to appear in their natural condition. Minor adverse impacts were identified in areas where informal trails and/or bare ground

(readily attributable to footprints, trampled ground, grazing, and/or hoof prints) would be present, but would consist of small patches or segments confined to the immediate periphery of developed facilities or formal trails. Moderate adverse impacts were identified in areas where informal trails and/or areas of bare ground would have appreciable and readily noticeable effects on soil quality and function. Informal trails would be long or networked and would physically segment sensitive soils. Evidence of pack stock use would be readily observable and fairly widespread. Major adverse impacts would occur in areas where intense visitation, pack stock use, grading, or excavation would cause large and contiguous areas underlain by sensitive soils to be permanently and irrevocably damaged. Beneficial impacts were identified where current or past adverse impacts on soils would be reversed or restored. For example, if existing conditions represent a minor adverse impact, reversal or restoration of that condition would represent a minor beneficial impact.

Actions involving new or reconfigured parking areas, utilities and transportation infrastructure, and/or visitor lodging and employee housing would also affect soil conditions. The intensity of impacts of such actions on soil resources would depend on the magnitude and extent of soil disturbance/excavation along with the degree of sensitivity of the soils being disturbed. Impacts would be negligible or minor where soils have been previously disturbed, compacted, paved over, or used as fill. Impacts would be moderate or major (depending on magnitude and extent of disturbance) where soils have not been previously disturbed and that currently support native vegetation.

- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of impacts. A long-term impact would have a permanent effect on public safety and soil resources.
- **Type of Impact.** Impacts were evaluated in terms of whether they would be beneficial or adverse to soils in the Merced River corridor or on the impact of geologic processes with regard to public or facility safety. Beneficial impacts would limit the exposure of people and property to the potential effects from rock falls or earthquakes, or would restore currently affected soils to more natural conditions. Adverse impacts would be those that present an increased public or facility exposure to potential rock fall events and/or damage resulting from earthquakes or cause further harm to or damage soils.

### *Environmental Consequences of Alternative 1 (No Action)*

#### **All River Segments**

##### *Impacts of Actions to Protect and Enhance River Values*

**Soils.** Continuation of current management would result in trampled vegetation and soil erosion and compaction in areas of high or concentrated visitor use, particularly those located outside of formal trails. These include informal trails throughout Yosemite Valley meadows, informal trails leading to archeological sites, and informal trails adjacent to scenic vista points. Continued Merced River access would result in increased erosion, removal of vegetation, and decreased soil stability. Fluvial mechanics resulting in bank erosion and loss of bank soil would also continue due to the presence of

riprap on riverbanks and infrastructure in the river channel. Riverbanks covered by riprap or otherwise armored, while locally protecting the soils from fluvial erosion, can often result in increased erosion downstream by changing the location and velocity of erosive flows. The intensity of impacts on soils from visitor use and administrative activities would vary widely based on location, the type/intensity of visitor and administrative activities, and individual soil characteristics. All segments (1–8) would have some degree of impacts on soils, ranging from negligible to moderate (see individual segment descriptions below).

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Under Alternative 1 (No Action), the potential for adverse impacts on visitors and park facilities from unstable rock slopes and seismic events would not change. Mass movement from unstable rock slopes would continue to result in periodic, though unpredictable rock falls and/or debris flows. In addition, seismic risks of injury to visitors and damage to facilities would occur in the developed portions of Yosemite National Park, such as Yosemite Valley, El Portal, and Wawona. In these areas, buildings and other facilities placed in saturated alluvial soil (e.g., in the floodplain of the Merced River) could be susceptible to secondary hazards from seismic groundshaking, such as liquefaction and seismically induced settlement. Earthquakes in the Sierra Nevada region would continue to expose visitors to injury in unstable buildings or to hazards caused by seismically triggered mass movement from rock slopes. These geologic hazards would continue to expose visitors and facilities to potential injury and/or damage, especially in established rock-fall hazard zones. Along the Merced River, rock falls can occur in the upper Wilderness reaches (Segment 1), along the edges of Yosemite Valley (Segment 2), in the Merced River Gorge (Segment 3) and in El Portal (Segment 4). Existing levels of public and facility exposure to geologic hazards along the South Fork Merced River (i.e., Segments 5, 6, 7, and 8) are somewhat less pronounced because hill slopes are less steep and because the level of visitor/recreational use is lower. Emergency preparedness systems, developed to respond to natural disasters in areas of heavy visitor use, would remain in place.

As discussed in the affected environment section, rock fall represents the greatest geologic hazard for visitors and facilities in Yosemite National Park, having caused about a dozen deaths, several dozen injuries, and periodic damage to roads and structures. Public risks to geologic hazards depend on numerous factors, such as where the future probability of rock fall is highest relative to where visitor serving, concessioner, and administrative facilities are located. For most segments (Segment 1, 3, 5, 6 and 8), Alternative 1 (No Action) would not appreciably increase or decrease exposure of visitors and facilities to existing levels of risk from geohazards because 1) type and severity of geologic hazards and associated risk to people and structures would remain the same, 2) levels of visitation would continue to be similar, and 3) no new visitor or administrative facilities would be constructed in hazardous areas. Therefore, Alternative 1 would result in segment-wide negligible long-term impacts with respect to geohazards.

However, implementation of the 2012 Yosemite Valley Geologic Hazard Guidelines and certain actions to manage user capacity, land use, and facilities within Segment 2, Segment 4, and Segment 7 would locally reduce existing levels of public exposure to geologic hazards (these are discussed below under the segment specific analyses).

**Soils.** Under Alternative 1, areas of high or concentrated visitor use would continue to be used at the same or similar levels, resulting in continued impacts on soil resources. Current use of well-developed and well-traveled areas in the park would continue to cause erosion and compaction. Areas of bare soil, compacted earth, and informal trail networks are likely to remain at the same locations and level of severity (as described segment by segment, below).

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Soils are relatively intact in Segment 1, with several exceptions listed below. Most impacts on soils in Segment 1 are associated with soil compaction connected to foot traffic and pack stock use. Some meadow soils appear to be recovering from the effects of high levels of grazing. The NPS restricted pack stock grazing at several meadows east of Merced Lake in the 1990s, and the meadows exhibit signs that levels of bare ground are recovering to natural conditions. Long-term monitoring could substantiate the trends at these meadows. See Figure 8-7 and Figure 8-8 for maps identifying the meadows in Segment 1.

There are informal and formal maintained trails in the Merced Lake meadow (1.6 kilometers of informal trails), meadows around the Triple Peak Fork area, wetlands near Echo Valley and Merced Lake shore, and mineral springs between Merced Lake and Washburn Lake (Ballenger and Acree 2011). The Merced Lake meadow also contains areas of bare soils caused by visitor activities. Informal trails compact soils and fragment meadow habitat, and areas of bare soil preclude establishment of meadow habitat.

Administrative stock use have resulted in extensive trampled and grazed areas, manure, and roll pits in the meadow and surrounding forest at the Merced Lake East Meadow. In general, pack stock trampling can lead to a variety of negative effects, including reduction in vegetation cover, increases in bare soil, and changes in species composition, soil compaction, and impacts on stream morphology (Cole et al. 2004). Site-specific studies in this meadow found lower vegetation cover and higher bare-ground levels when compared with other subalpine meadows (Ballenger and Acree 2011). In 2011, the NPS enacted temporary “prototype management measures” at the site, which require packers to bring in feed to this site and discontinue grazing in the meadow. These measures are not part of a formal policy, and under Alternative 1, they are not guaranteed to continue in the future.

Meadow impacts associated with soil compaction would continue under Alternative 1, and comprehensive ecological restoration would not take place. Meadow soils in meadows east of Merced Lake, where pack stock grazing was discontinued in the 1990s, would continue to recover from the effects of high levels of pack stock grazing. There would be local, long-term, minor, beneficial impacts on soil resources at these meadows. Local, long-term, minor, adverse impacts to soil resources would continue at the extensive network of informal trails in the Merced Lake meadow, meadows around the Triple Peak Fork area, wetlands near Echo Valley and Merced Lake shore, the mineral springs between Merced Lake and Washburn Lake, and at Merced Lake East Meadow.

In a segmentwide context, soils are generally in their natural condition due to the absence of park facilities and the generally low level and intensity of visitor- and administrative-use impacts. On a segmentwide level, Alternative 1 would have long-term, minor adverse impacts on soil resources.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** The same kinds and amounts of use that exist today would be accommodated in Segment 1. For the same reasons described above, on a segmentwide level, Alternative 1 would have long-term, minor, adverse impacts on soil resources.

**Segment 1 Impact Summary:** Ongoing park resource management efforts would continue to have local, long-term, minor, beneficial impacts on Segment 1. On a segmentwide and local level, there would be long-term, minor, adverse impacts to soil resources due to the extensive network of informal trails at several discrete locations. Visitor use patterns would continue to result in segment-wide, long-term, minor, adverse impacts.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Under Alternative 1, accelerated riverbank erosion and soil compaction would continue to occur, particularly between Clark's Bridge and Sentinel Bridge and areas easily accessible from adjacent roads. This includes concentrated visitor access areas, such as near Lower Pines and North Pines campgrounds, Housekeeping Camp, Swinging Bridge, Sentinel Beach, El Capitan, and Cathedral Beach picnic areas. Erosion would continue to occur in areas upstream and downstream of bridges (including Clark's Bridge, Stoneman Bridge, Housekeeping Bridge, Sentinel Bridge, El Capitan Bridge, and Pohono Bridge), and around some meander bends (Cardno Entrix 2011).

Under Alternative 1, current informal trails would remain in many of the Valley's meadows. Existing levels of bare ground (as exhibited in study plots) would remain or increase in meadows, with El Capitan and Sentinel meadows exhibiting the highest levels of bare ground (Cardno Entrix 2011). Cook's and Stoneman meadows (with boardwalks) would continue to have the lowest levels of bare ground (Cardno Entrix 2011). The stock trail directly below Happy Isles Bridge, directly adjacent to the Merced River, would continue to erode sediment into the river. However, under Alternative 1, the NPS would continue ecological restoration projects in several Yosemite Valley meadows and on the riverbank in certain places (per the settlement agreement). Specifically, the NPS would proceed with restoration projects at Bridalveil, Cook's, and El Capitan meadows, as well as riverbank restoration at North Pines Campground. These restoration projects would result in local, long-term, minor to moderate, beneficial impacts on soil resources. However, in other areas where restoration projects would not occur under Alternative 1 (e.g., Sentinel Meadow), there would continue to be local, long-term, minor to moderate, adverse impacts on soil resources via trampling and the existence of informal trails.

*Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards:** NPS and its contractors would continue to conduct site-specific geologic analyses prior to the construction of buildings and other facilities to determine potential soil instability. Although rock fall and earthquakes are unavoidable, the NPS would continue to avoid locating facilities in areas with a relatively high risk of rock fall or other geologic events. In accordance with the 2012 Yosemite Valley Geologic Hazard Guidelines, no new facilities would be placed in the established rock fall hazard zone within the valley, and a number of existing structures under high rock fall risk in Curry Village will be closed, relocated, or repurposed. As part of the newly adopted policy, approved actions to be taken by the NPS include elimination or reduction of occupancy in five dormitories (housing concessioner employees) and five cabins (ten visitor lodging units), as well as the relocation of approximately 20 tent cabins outside the rock fall hazard zone.

Implementation of these guidelines under Alternative 1 (No Action) would reduce the overall rock fall hazard risk in Yosemite Valley by 95% compared to 2007 levels. This represents a greater reduction of risk than that of the Curry Village closures that have already occurred as a result of the 2008 Glacier Point Rock fall (that action reduced risk by 87 percent). For these reasons, Alternative 1 would result in local, long term, moderate, beneficial impacts with respect to exposure of park visitors to geohazards.

**Soils.** No new structures or facilities would be constructed under Alternative 1. Use levels and the day-to-day management of natural resources would generally continue as under existing conditions. Exceptions would be the *East Yosemite Valley Utilities Improvement Plan/EA* and the Wauhoga Indian Cultural Center, which are projects that would continue to cause local, short-term, minor, adverse impacts to soils during the construction phase. Camping areas, visitor facilities, formal parking, lodging, and employee housing would continue to be occupied at the same or similar levels and operated/managed in a similar manner. Informal parking could potentially increase. The NPS removed several facilities following the 1997 flood, leaving remnant fill soils. These sites include the Yosemite Lodge Former Cabins without Baths and the Upper River and Lower River campgrounds. Remnant fill soils and compacted soils would remain, precluding natural floodplain processes and riparian and meadow vegetation recruitment.

Overall, the presence of disturbed ground, construction-related fills, and the general coverage and density of developed facilities would continue to result in a segmentwide, long-term, moderate, adverse impact on soil resources.

**Segment 2 Impact Summary:** Implementation of the 2012 Yosemite Valley Geologic Hazard Guidelines and associated visitor use and facilities actions would result in local, long-term, moderate, beneficial impacts with respect to geohazards. Visitor use patterns and facilities would continue to have local and segmentwide, long-term, minor to moderate, adverse impacts on soil resources.

## **Segments 3 and 4: Merced Gorge and El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** At the Cascade Picnic Area in Segment 3, there is abandoned infrastructure including a picnic table-sized concrete block, surface concrete, asphalt and 1-2' base material (rock). Under Alternative 1, this concrete, asphalt and rock fill would continue to redirect/impede high river flows, and would continue to preclude development of a natural soil regime in that small area. In Segment 2, vehicles park under the drip line of valley oak trees in El Portal. This practice results in compacted soil under the trees, affecting root health, water uptake, and soil aeration. Under Alternative 1, development and soil compaction from vehicles and foot traffic in the vicinity would continue to limit recruitment of oak seedlings. The presence of abandoned infrastructure and informal parking under valley oak trees would continue to cause highly localized, long-term, minor, adverse impact in Segments 3 and 4. These minor impacts do not rise to the level of a segmentwide adverse impact because they are not consistent along the entirety of Segments 3 and 4.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards:** NPS and its contractors would continue to conduct site-specific geologic analyses prior to the construction of buildings and other facilities to determine potential soil instability. Although rock fall and earthquakes are unavoidable, the NPS would continue to avoid locating facilities in areas with a relatively high risk of rock fall or other geologic events. However, existing facilities in El Portal will remain at risk of damage in the unlikely event of a large earthquake, or in the event of a rockfall or landslide. Because the existing risk to visitors and facilities in El Portal from geohazards would remain unchanged under the No Action Alternative, Alternative 1 would result in no impact with respect to exposure of park visitors to geohazards.

**Segments 3 & 4 Impact Summary:** The parking of vehicles under the drip lines of valley oak trees within Segment 4 would continue to have a local, long-term, minor, adverse impact on soils supporting valley oak trees.

## **Segments 5, 6, 7 and 8: South Fork Merced River**

### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Continuing impacts to soil resources from informal trailing, physical soil disturbance, and accelerated riverbank erosion would be concentrated in several discrete areas along the South Fork Merced River, including the Wawona Town Center, the Wawona Impoundment, the Wawona Campground and picnic area, and several cultural resource sites. In the town center, stresses to soil resources would continue to occur at the Wawona Hotel, golf course, and the Wawona store picnic area during periods of peak visitation because a lack of formal access points result in the loss of riparian vegetation, social trailing, and riverbank erosion. In addition, maintenance and usage of the Wawona Hotel causes impacts from construction, structures, roads, foot traffic (on and off paths), parking, utilities, and landscaping. The picnic area is adjacent to a moderately steep riverbank and river access at this point causes riparian vegetation trampling and minor erosion. In addition at the



Wawona Campground, minor riverbank erosion is present, and septic tanks and leach fields may be locally contaminating soils when their capacity is exceeded. These impacts are pronounced but highly localized, and continuation of current management is unlikely to substantially worsen the situation. Therefore, impacts (primarily due to continuing use/operation of the golf course, are considered local, long-term, moderate and adverse.

**Segments 5-8 Impact Summary:** Visitor use patterns would continue to result in local, long-term, minor, adverse erosion and soil resource impacts on Segment 7.

### Summary of Alternative 1 (No Action) Impacts

The NPS would adopt the 2012 Yosemite Valley Geologic Hazard Guidelines, reducing the hazard and risk to facilities in Segment 2, which would involve actions that in combination with the Curry Village closures from 2008, would reduce the risk to structures by about 95% compared to 2007 levels. Considering the unpredictable and unavoidable nature of rock fall and earthquakes and the history of their occurrence in Yosemite, there may continue to be parkwide, long-term, moderate, adverse impacts to public safety and facilities from geohazards. However, Alternative 1 would locally and incrementally decrease rock fall hazard risks in Yosemite Valley through implementation of the Geologic Hazard Guidelines.

Local, long-term, minor to moderate, adverse impacts on soil resources would continue in several areas in the park, including areas of concentrated riverbank use in Segment 2, as well as sensitive meadow soils in Segments 1 and 2. There would be a parkwide, long-term, minor, adverse impacts on soil resources because the moderate adverse soil impacts that have been identified are limited to specific areas (local), and are not otherwise continuous or widespread.

### Cumulative Impacts of Alternative 1 (No Action)

The discussion of cumulative impacts on geological resources is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region, in combination with the potential effects of Alternative 1. The projects identified below include only those projects that could affect geological resources in or in the vicinity of the Merced River corridor.

#### *Past Actions*

Past actions have resulted in a range of beneficial and adverse impacts on soils.

Beneficial impacts from past actions include improved soil conditions from habitat restoration and prevention of erosion around structures from removal of large wood. Substantial benefits to soils in the Merced River corridor have also occurred through implementation of management plans that limit or end grazing, concentrate visitor impacts to designated areas, and trail and roadway maintenance and rehabilitation actions that reduce the severity of soil erosion. Specific examples of past projects include the following:

- **Restoration:** Cascades Housing Removal (including associated restoration work), Cook's Meadow Ecological Restoration, Fern Springs Restoration, Happy Isles Dam Removal, Happy

Isles Fen Habitat Restoration Project, Merced River Ecological Restoration at Eagle Creek Project

- **Management and Planning:** *South Fork and Merced Wild and Scenic River Implementation Plan* (BLM and US Forest Service 1991)
- **Rehabilitation of Trails and Roadways:** El Portal Road Improvement Project, Reconstructing Critically Eroded Sections of El Portal Road, Happy Isles to Vernal Fall Trail Reconstruction, Lower Yosemite Fall Project, Red Peak Pass Trail Rehabilitation, Yosemite Valley Loop Road Rehabilitation, Wawona Road Rehabilitation Project

Adverse impacts from past actions include increased exposure of visitors and employees to geohazards (rock falls and seismic events) from facility development, such as hotels, visitor centers, campgrounds, bridges, roads, maintenance structures, and utilities. Facility development also has contributed to adverse impacts on soil resources (compaction, soil removal, soil erosion, and construction-related fill). Specific examples of past projects include Curry Village Employee Housing; Curry Village Huff House Temporary Housing; Curry Village Temporary Guest Showerhouse; Yosemite Valley Ahwahnee Temporary Employee Housing; and the South Entrance Exit Lane Project.

#### ***Present Actions***

Present actions contribute to similar beneficial and adverse impacts, as described for past actions, above.

Beneficial impacts from present actions are similar to those discussed for past actions. Specific examples of present projects include the following:

- **Restoration:** General Ecological Restoration
- **Management and Planning:** *Vegetation Management Plan*
- **Rehabilitation of Trails and Roadways:** Tioga Road Rehabilitations
- **Rock fall Avoidance and Stabilization:** Curry Village Rock-fall Hazard Zone Structures Project

Adverse impacts from present development actions are similar to those discussed for past actions. Specific examples of present projects include the following:

- **Facility Development:** Crane Flat Utilities, *East Yosemite Valley Utilities Improvement Plan/EA*, Wauhoga Indian Cultural Center, Parkwide Communication Data Network, NatureBridge Environmental Education Campus

#### ***Reasonably Foreseeable Future Actions***

Reasonably foreseeable future actions would also have beneficial and adverse impacts.

Beneficial impacts from future actions are similar to those discussed for past and present actions. In addition, future actions include seismic upgrades and stabilization projects that would reduce the risk of harm from seismic events. Specific examples of future projects include the following:

- ***Rehabilitation of Trails and Roadways:*** Concessioner Parking Lot Restoration Project

Future management and planning activities may have both beneficial and adverse effects. For example, management plans may have beneficial impacts on soils from limiting access or designating areas for ecological restoration. However, management plans may also increase facility development based on visitor demand and growing population, which could have adverse impacts on soils or result in development in areas susceptible to rock falls. The NPS would continue its policy of avoiding placement of new structures in rock-fall hazard zones in Segment 2, as discussed in further detail in the 2012 Yosemite Valley Geologic Hazard Guidelines. In addition, removing closed/abandoned structures from rock fall hazard zones, as is being done under the Curry Village Rock-fall Hazard Zone Structures Project, would discourage uncontrolled visitor use of the hazardous area, thereby reducing rock fall hazard risks for park visitors. An example of a reasonably foreseeable management plan includes the *Yosemite Wilderness Stewardship Plan/EIS*.

### ***Overall Cumulative Impact***

Past and present projects and management plans that include the existence and maintenance of facilities in rock-fall hazard areas, when considered with Alternative 1, would still expose park visitors and employees to injury and damage from earthquakes and rock falls which is a parkwide, long-term, moderate, adverse impact. Continued stabilization and rehabilitation work, and policy restrictions from development in rock-fall hazard zones in Segment 2, would provide some local, long-term, moderate, beneficial impacts.

Cumulatively, a combination of adverse and beneficial impacts on soil resources would occur under Alternative 1. The net effect of these projects is difficult to anticipate, but would likely result in an overall balance between beneficial and adverse impacts. This balance of impacts would be considered a parkwide, long-term, negligible, adverse, cumulative effect.

## ***Environmental Consequences to Actions Common to Alternatives 2–6***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

**GeoHazards.** Biological resource actions include removing and restoring informal trails, and directing the public onto established trails and Merced River access points. In the long-term, these actions would result in a slight reduction in the geographic dispersal of visitors, because a greater number of visitors would be directed to established trails and river access points, and because informal trails would no longer be available for use following their removal and restoration. These actions would be performed primarily outside of the rock-fall hazard zone and would not involve installation or relocation of habitable structures. While the geographic distribution of public visitation to the park

may become less dispersed and more concentrated in established park facilities and along established trails, the type and level of public exposure to geohazards would remain similar to existing conditions. These ecological restoration actions would result in long-term, parkwide, negligible, adverse impacts on the public and park facilities from geohazards.

**Soils.** In the short-term, both biological resource actions (discussed for geohazards) and hydrologic/geologic resource actions (removing abandoned infrastructure and riprap in the floodplain) involve earth-moving activities that would include grading, excavation, and soil stockpiling. Without mitigation, these activities could result in localized, short-term, minor, adverse impacts on soil resources by temporarily increasing their erosion potential (from wind or rainwater runoff). Implementation of soil and stormwater management mitigation measures MM-GEO-1 and -2, and MM-HYD-1 (see Appendix C), would reduce the short-term impacts of restoration actions on soil resources, and result in local, short-term, negligible, adverse impacts on soil resources. Short-term restoration impacts on soils would be the same for Segments 1–8 under Alternatives 2–6; therefore, the restoration soil impact analysis for Alternatives 2–6 only describe the long-term impacts of restoration actions on soil resources.

In the long-term, both biological resource actions and hydrologic/geologic resource actions common to Segments 1–8 under Alternatives 2–6 would decompact and revegetate soils along informal trails, restore meadow habitat, remove abandoned infrastructure and riprap in the floodplain, stabilize riverbanks by using bioengineering techniques, and restore riparian vegetation. In addition, measures to direct the public onto established trails and existing Merced River access points would be implemented, thereby reducing the dispersal of the public in natural areas. These actions would result in a slight increase in foot traffic along established trails, while allowing soils along informal trails, in meadows, and along the floodplain in the park to recover their natural function and support native vegetation. Moreover, actions aimed at restoring the natural hydrology of the Merced River would result in reduced riverbank erosion and increased channel complexity through strategic placement of large wood. Removal of hardened banks (e.g., riprap, abandoned utilities, bridge footings) would promote stream channel complexity and restore natural processes.

In the local areas where these actions would be performed, they would have long-term, moderate, beneficial impacts on soil resources. In segmentwide and parkwide contexts, these actions would have a long-term, minor, beneficial impact on soil resources.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur across all segments under Alternatives 2-6 include removing 3,400 feet of riprap from the river bank and revegetating with riparian species, and replacing an additional 2,300 feet of riprap with bioengineered riverbank stabilization devices. Short term impacts of ecological restoration are discussed above. After earth-moving activities, these projects would result in reduced riverbank erosion and increased channel complexity. In the local areas where these actions would be performed, they would have long-term, moderate, beneficial impacts on soil resources. In segmentwide and parkwide contexts, these actions would have a long-term, minor, beneficial impact on soil resources.

## Segment 1: Merced River Above Nevada Fall

### *Impacts of Actions to Protect and Enhance River Values*

**Soils.** Restoration actions would 1) relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas, 2) harden the trail along the wet sections of the Mist Trail to avoid trail widening, and 3) prevent trail creep along the John Muir Trail using fencing and boardwalks. Actions would also remove informal trails through sensitive high-elevation meadow habitat, reroute or install boardwalks for trails that fragment and incise high-elevation meadow habitat, and maintain trails adjacent to sensitive vegetation communities. These actions would reduce localized stresses on the soil resources present at high-elevation meadows and sensitive vegetation communities by reducing the level of soil trampling, and rerouting and/or maintaining trails in a manner that would discourage continuing visitor use impacts on soil resources. These actions would result in localized long-term, moderate, beneficial impacts on soil resources in high-elevation meadows and sensitive vegetation communities. In a segmentwide context, these actions would have a long-term, minor, beneficial impact on soil resources.

**Segment 1 Impact Summary:** Actions to protect and enhance river values within Segment 1 would result in a local, long-term, minor, beneficial impact on soil resources.

## Segment 2: Yosemite Valley

### *Impacts of Actions to Protect and Enhance River Values*

**Soils.** Restoration actions in Segment 2 would, generally, restore meadow habitat, improve Merced River hydrology, restore the bed and banks of the river, and restore vegetation. These actions would allow soils to recover to their natural function (through decompaction and revegetation), reduce the potential for scour along the riverbanks, restore hydrologic processes, and protect bank soils from erosion.

Meadow and vegetation restoration actions would improve meadows currently disconnected from the floodplain by installing wide box culverts and formalizing or removing parking, removing unnecessary or abandoned infrastructure from meadows and riparian areas, removing old fills, decompacting soils and informal trails, and revegetating of areas formerly denuded of vegetation. These actions would allow soils to recover to their natural function (through decompaction and revegetation), and would also reduce the erosion susceptibility of soils in localized areas because flow paths would be less restricted.

The actions described above would, in many areas, allow soils to recover from past disturbances and would allow natural riverine and meadow processes to resume without interference from past and present human alterations. Soil compaction resulting from heavy visitor use would be further concentrated in areas that are already highly compacted or in resilient areas less sensitive to disturbance (e.g., boardwalks, paved trails, sandy beaches). Meadow and vegetation restoration actions listed above would, in combination, remove and restore 6 miles of informal trails in Yosemite Valley. The restoration actions associated with biological, riparian, and meadow values listed above would, at a minimum, seek to restore approximately 42 acres of meadow and riparian habitat.

However, implementation of the aforementioned restoration actions would not totally avoid adverse impacts on soil resources in Yosemite Valley. Restoration actions would generally redirect park visitors to fewer but formal trails and access points. As a result, crowded conditions during periods of peak visitation in the park may worsen. This would result in minor incremental increases in soil compaction on already compacted and denuded areas along formal trails. In addition, under such conditions, park visitors may be increasingly likely to disregard park rules, fencing and signage, and seek out alternative routes to popular destinations. During periods of peak visitation, it is uncertain whether long-term efforts to redirect park visitors away from informal trails would be fully successful. Nevertheless, even if partially successful, the restoration actions would largely result in a substantial reduction in the stressors adversely affecting soil type and quality in the Valley. Restoration actions would result in local, long-term, moderate, beneficial impacts on soil resources in Segment 2. In a segmentwide context, these restoration actions would result in long-term, minor, beneficial impacts on soil resources.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternatives 2-6 include: restoring 4.5 acres of riparian habitat in the area of Yosemite Lodge and 20 acres in the area of the Former Lower Pines Loop Campground; restoring impacted areas of Ahwahnee Meadow including through removal of tennis courts; formalizing areas for parking and river access along El Portal Road, between the intersection of Big Oak Flat road and Pohono Bridge; improving access and infrastructure at Cathedral Beach, Housekeeping Camp, and Bridalveil; constructing a boardwalk extension to reduce Sentinel Meadow trampling; fencing and vegetation management at Stoneman Meadow; relocation of parking from Devil's Elbow; and filling ditches not serving current operational need. These actions would reduce erosion and allow soils to recover to their natural functions which would result in a long-term, local, moderate, beneficial impact to soils.

**Hydrologic/Geologic Resource Actions.** Project specific actions include placing constructed logjams in the channel between Clarks and Sentinel Bridges; and removing the abandoned gauging station at Pohono Bridge, removing the footings and former river gauge base at Happy Isles, and restoring these areas to natural conditions. After construction, these projects would result in reduced riverbank erosion, increased channel complexity, reduced scour, and improved vegetative recruitment. In the local areas where these actions would be performed, they would have long-term, moderate, beneficial impacts on soil resources.

**Cultural Resource Actions.** Cultural resource actions common to Alternatives 2-6 would include rehabilitation of informal trails and parking in the vicinity rock art and rock shelters near Bridalveil Falls, fencing and/or restricting access to the archeologically significant large bedrock mortar (pounding rock) around Yosemite Falls Trail, restoration of impacted portions of Ahwahnee Meadow, and removal of abandoned infrastructure from the Bridalveil sewer plant to enhance oak recruitment. These actions would have local, long-term, negligible to minor, beneficial impacts with respect to geohazards and soil resources because the areas have already been impacted by visitor activities (i.e., vegetation removal and soil compaction), and involve no new structures within a rock fall hazard zone.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values that would occur within Segment 2 under Alternatives 2-6 include: selective thinning of conifers and other vegetation in the vicinities of The Ahwahnee and Meadow, Bridalveil Falls and West Valley, Cooks and

Sentinel Meadows, Curry Village, El Capitan, Housekeeping Camp, Yosemite Lodge, and other areas of the Valley; restoring grassland and oak habitat in the areas of Bridalveil Straight; repairing riverbank erosion at Clark's Bridge; and addressing informal trails and trampling at the east end of El Capitan Meadow. These actions would restore natural meadow, riparian, and grassland habitat and soil functions, and therefore result in local, long-term, negligible, beneficial impacts on soil resources.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Facilities actions in Yosemite Valley would relocate, remove, repurpose, and retain a number of existing facilities. Construction of new facilities, if required for facilities that are relocated or removed, would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can reasonably be anticipated in the region. Further, facilities to be relocated would not be relocated into the rock-fall hazard zone, in keeping with the 2012 Yosemite Valley Geologic Hazard Guidelines. Facilities actions would result in a segmentwide, long-term, negligible, adverse impact with respect to geohazards.

Transportation actions all involve the circulation patterns of the general public along roadways, in parking lots, and shuttle stops. These actions would have minimal, if any, consequences with respect to public exposure to geohazards, including rock fall. While the Wilderness parking area is in the rock-fall hazard zone, transportation actions would formalize the area and apply sound design principles to the installation of proper drainage, but would not increase the size or capacity of the parking area. The transportation actions would not result in the construction of new facilities or actions that would increase the level of risk or exposure to geohazards. Transportation actions would result in a segmentwide, long-term, negligible, adverse impact with respect to geohazards.

**Soils.** Programmatic actions to manage user capacity, land use, and facilities common to all alternatives in Yosemite Valley would primarily occur in the East Valley campgrounds, the Curry Village area, and the Yosemite Lodge Area (e.g., Camp 4). The actions would involve:

- permanent removal of structures, including temporary employee housing (about 118 cabins) at Huff House and an old gas station at Camp 4,
- construction of 16 new dormitory-style buildings to provide permanent housing for 164 employees in Curry Village (to replace the cabins at Huff House),
- construction of 51 new campsites (35 at Camp 4 and 16 at Yosemite Backpackers Camp),
- construction of a new 41-space parking lot for the Camp 4 campground, and a new 25-space overflow parking lot on the south side of Northside Drive, and
- several actions to redesign high visitor use areas (e.g., Bridalveil Fall area), formalize visitor access, parking areas and shuttle stops (e.g., wilderness parking area, El Capitan area, Bridalveil Fall area, and Camp 4).

Construction, removal, demolition, and/or replacement of structures, pathways, parking areas and shuttle stops in all cases would locally cause short-term construction-related disturbances due to



excavation, grading, soil moving, and/or re-compaction. However, with several exceptions (discussed below) most of the disturbed areas would be within soils that have already experience disturbance through compaction, trampling, or development (roads, utilities and structures). In addition, for most of these projects, the NPS, as part of standard procedure, would require submittal of a Storm Water Pollution Prevention Plan, a Hazardous Materials Spill Prevention and Response Plan, and would require that NPS workers and/or its contractor(s) to incorporate standard resource protection measures prior to approval of any work for projects in the park, which are described under the project level analysis below (see Appendix C for a list of applicable mitigation measures).

In the Curry Village area, the facility actions would ultimately reduce the physical footprint used to accommodate employee housing because 16 new (higher-density) dormitories would be built to replace about 118 cabins (providing the space necessary for restoration actions). However, the physical footprint of both Camp 4 and the Backpackers Camp would be expanded substantially, and are likely to result in localized soil disturbances through trampling, compaction and installation of new camping facilities (pathways, bathrooms, bear boxes and tent pads) and parking lots. The new camping facilities would be located to avoid sensitive habitats (i.e., meadows) and soils, but would nevertheless cause soils to be permanently disturbed or experience stressors due to local increases visitor use levels (e.g., trampling and compaction). Following establishment of formal shuttle stops and removal of informal and overflow parking at the El Capitan, Bridalveil Fall and other areas, compacted soils in and around these high-use areas would be restored and in the future would experience fewer stressors as a result of heavy foot traffic from visitors entering and exiting vehicles.

Recreation actions would create an interpretive (nature) walk through Lower River Campground that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the Merced River. The interpretive walk would involve creation of a new, paved trail, which would have minor, adverse impacts on soil resources. The interpretive trail could have the indirect effect of encouraging visitors to stay on formal trails by raising awareness of the importance of preserving habitat. Improvement of wayfinding at Camp 6 and Happy Isles would help to prevent trampling. Recreation actions common to Alternatives 2–6 would locally disturb soils where the interpretive walk would be installed, but could indirectly result in beneficial impact on soil resources in Segment 2.

Depending on the location and type of action, actions to manage user capacity, land use, and facilities common to all alternatives would have both locally beneficial (where physical footprint of facilities would be reduced or where visitor management actions discourage trampling) as well as locally adverse impacts on soil resources (where actions would permanently disturb and/or remove native soils). Collectively, facilities actions common to Alternatives 2–6 would result in a segmentwide, long-term, minor, adverse impact on soil resources in Segment 2.

Transportation actions would involve formalizing shuttle stops and overflow parking that currently have impacts on sensitive communities (and, by extension, on the soils that support them); remediating the soils at the Wilderness parking lot; redesigning and formalizing existing parking to provide for proper drainage; and constructing new parking spaces. Current impacts on soil resources from overflow parking and informal shuttle stops are confined to peripheral areas in proximity to vehicle and shuttle parking locations. Following establishment of formal shuttle stops, compacted soil areas would be restored and in the future would experience fewer stressors as a result of heavy foot traffic from visitors entering and

exiting vehicles. Remediation of soils that are currently contaminated at the Wilderness parking lot would allow soils to be restored to their natural condition and support native vegetation. Formalizing and redesigning existing parking would reduce erosion by ensuring proper drainage design. New parking spaces would result in minor to moderate, adverse impacts on soil through compaction and paving, and the reduction in permeable surface area from parking spaces would increase erosion at the local level. Nevertheless, the transportation actions common to Alternatives 2–6 would in combination result in a segmentwide, long-term, minor, beneficial impact on soil resources.

**Camp 6 & Yosemite Village.** Actions in the Camp 6 and Yosemite Village areas that are common to Alternatives 2-6 involve: (1) the relocation of visitor vehicle services and concessioner general office functions to other buildings and the removal of the existing garage structure and concessioner general office; and (2) transportation actions that formalize parking and public movement in the Camp 6 and Village Sport Shop area. As part of these actions, informal parking along sentinel drive and several structures in the floodplain would be removed, thereby allowing underlying sensitive meadow soils to recover or be actively restored. These actions would have long-term beneficial impacts to soil resources as described above for actions to protect and enhance river values.

Building demolition and construction of transportation facilities in the Camp 6 area would involve the use of heavy machinery (e.g., tractors, heavy-duty trucks, and demolition equipment) and result in short-term local soil disturbances through soil compaction and mixing. The maximum amount of soil disturbance would vary by alternative, but in either of the cases would be at least 20 acres. Facility construction, demolition activities, and/or use of material and equipment staging areas could, in specific areas, result in the loss of soil function. However, most construction and demolition activities would occur in locations that are already developed, and use of undeveloped areas that have soils supporting native vegetation for purposes of construction-related parking, material and equipment staging, and/or construction/demolition activities would be avoided.

Further, the NPS, as part of standard procedure, would require submittal of a Storm Water Pollution Prevention Plan, a Hazardous Materials Spill Prevention and Response Plan, and would require that NPS workers and/or its contractor(s) to incorporate standard resource protection measures prior to approval of any work for projects in the park. Such measures include but are not limited to (1) fencing off or flagging sensitive areas and resources, (2) the inventory, salvage, and/or protection in place of native trees, shrubs, vines, grasses, and other native vegetative features, (3) persevering and stockpiling native topsoil for use in post-construction reclamation of temporarily disturbed areas, and (4) implementation of water quality management measures and hazardous materials spill prevention and response measures. Finally, work for projects on NPS land would not be allowed to proceed without demonstrating compliance with the following Federal and State permits, where applicable: (1) U.S. Army Corps of Engineers nationwide permits for activities affecting wetlands and waters of the U.S., (2) a technically-conditioned Certification issued by the California Regional Water Quality Control Board for construction-related activities affecting the Merced River, (3) the State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities, and (4) the California Regional Water Quality Control Board Clean-Up and Abatement Order, No. 5 00-703, dated 2 August 2000, and a Time Schedule Order which directs Yosemite National Park to prevent discharges of untreated wastewater. See Appendix C for details of applicable mitigation measures.

For these reasons, actions common to Alternatives 2-6 in the Camp 6 and Yosemite Village areas would result in local, short-term, minor, adverse impacts on soil resources; but local, long-term, moderate, beneficial impacts through removal of infrastructure and parking from the meadow areas and floodplain.

**Yosemite Lodge & Camp 4.** Actions in the Yosemite Lodge and Camp 4 areas that are common to Alternatives 2-6 involve the removal of temporary employee housing and the reconstruction of new housing. Under all alternatives, the NPS Volunteer Office (former Wellness Center), post office, swimming pool, and snack stand would all be removed, and the convenience shop and nature shop would be re-purposed. While the ultimate magnitude and location of soil disturbance to occur as a result of the actions would be different than described above for the Camp 6 and Yosemite Village, the impact conclusion would be the same for the same reasons. The temporary soil disturbances as a result of facility construction and/or removal would be minimized by implementation NPS's standard procedures and compliance with the applicable Federal and State permits.

Actions common to Alternatives 2-6 in the Yosemite Lodge and Camp 4 areas would result in local, short-term, minor, adverse impacts on soil resources; but would have local, long-term, minor, adverse impacts through permanent disturbance of approximately 10 acres of previously undeveloped land.

**Segment 2 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1 through MM-HYD-5, as applicable (see Appendix C), actions to protect and enhance river values within Segment 2 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would also have long-term, local, negligible to minor, adverse impacts on soil resources; and local, long-term, negligible, adverse geohazards impacts.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Restoration actions would involve developing best management practices for revetment construction and repair, and remove abandoned infrastructure from the floodplain. These actions would allow soils to recover to their natural condition and support native vegetation, and would also reduce erosion to the river channel by utilizing vertical retaining walls, instead of rip rap revetment, where possible. These actions would result in a net reduction in surface area taken up by pavement and compacted soils would be decompacted, allowing them to recover to their natural condition. Further, recontouring and revegetating the riparian buffer would improve hydrologic processes and reduce riverbank erosion. Parking located across Foresta Road at the El Portal NPS Maintenance and Administrative Complex would be formalized, maximized, and improved, allowing the informal parking area to be ecologically restored. Creation of a formal parking lot would result in short-term soil disturbance within an already impacted area; but overall, these actions would have a local, long-term, minor, beneficial impact on soil resources in Segments 3 and 4.

**Biological Resource Actions.** Project specific actions include removing development, asphalt, and imported fill from the Abbieville and Trailer Village areas and recontouring and revegetating the

150-foot riparian buffer. This action would allow soils to recover to their natural condition which would result in a local, long-term, minor, beneficial impact on soil resources.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic resource values include restoring the Greenemeyer Sand Pit to natural conditions. This effort would help reestablish the site's natural soil character and function by removing fill materials and restoring the site's natural topography. The resulting impacts on soil resources would be local, long-term, minor, and beneficial.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards.** Facilities actions would construct infill housing units in Old El Portal to address the removal of temporary housing in Yosemite Valley and build a restroom in Old El Portal. Construction of these facilities would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can be reasonably anticipated in the region. Facilities actions would result in a segmentwide, long-term, negligible, adverse impact with respect to geohazards in Segments 3 and 4.

**Soils.** Facilities actions involving the infill of new housing units and construction of a restroom facility would directly disturb soil resources in small discrete areas through installation and compaction, and could also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the area affected would be small and localized, and the soils present in these areas are not particularly sensitive or unique (i.e., not in meadow or riparian areas). For these reasons, facilities actions would result in local, long-term, minor, adverse impacts on soil resources.

**Segments 3 & 4 Impact Summary:** With mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 3 & 4 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. Actions to manage user capacities, land use, and facilities would have long-term, local, minor, adverse impacts with respect to soil resources and geohazards.

#### **Segments 5, 6, 7 and 8: South Fork Merced River**

##### *Impacts of Actions to Protect and Enhance River Values*

**Soils.** The park would improve Wawona Campground wastewater and refuse management and facilities, remove abandoned infrastructure, and undertake numerous site-specific management measures to counteract or minimize ongoing impacts on cultural resources. These actions would benefit soil resources by removing current stressors (e.g., parking and foot traffic) and restoring soil function (through decompaction and replanting). For these reasons, restoration actions would result in a local, long-term, minor, beneficial impact on soil resources.

**Biological Resource Actions.** Specific projects include delineating the picnic area near the Wawona Store and establishing a formal river access point and path. Hardened river-access points and the establishment of formal trails would directly affect soil processes through paving and compaction, and

would also potentially attract additional visitors to the riverbanks, which could lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the picnic area would be formalized and river access points and trails would be hardened to prevent vegetation impacts and river erosion by directing visitors away from informal trails and sensitive soils to more resilient areas. The resulting impact on soil resources would be local, long-term, minor and beneficial.

**Hydrologic/Geologic Resource Actions.** The park would address problems with the capacity of the existing leach field at the Wawona Campground by building a waste water collection system. A pump station above the Wawona Campground would be constructed to connect the facility to the existing waste water treatment plant. The new Wawona wastewater collection facilities would be built according to modern building codes. This action would have a segmentwide, negligible, adverse impact with respect to the exposure of people and park facilities to geohazards. The new Wawona wastewater collection facilities would directly disturb soil resources through facility installation and compaction, although soils in this area are neither sensitive nor unique (i.e., not in meadow or riparian areas).

**Cultural Resource Actions.** Specific projects including removal of seven campsites from the Wawona Campground would help restore soils to their natural condition which would result in local, long-term, moderate, beneficial impacts.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards.** Facilities actions would build a new grounds maintenance facility, a wildland fire station, and a roads maintenance facility, and also rehabilitate the existing California Conservation Corps structure for potential re-use. Construction and rehabilitation of these structures would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can be reasonably anticipated in the region. Facilities actions would result in a segmentwide long-term, negligible, adverse impact with respect to geohazards in Segments 5, 6, 7, and 8.

**Soils.** Facilities actions would construct a new grounds maintenance facility, wildland fire station, and roads maintenance facility; replace restrooms next to the Wawona Store with larger restrooms; and remove staged materials, abandoned utilities, vehicles, and other items from portions of the Wawona maintenance yard that extend into the riverbank. New facilities would directly disturb soil resources in small, discrete areas through installation, compaction, and paving, and would also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the area affected would be small and localized, and the soils present in the areas are not particularly sensitive or unique. The ecological restoration of the Wawona maintenance yard would restore the riparian buffer and native ecosystem adjacent to and in the riverbank. For these reasons, facilities actions would result in local, long-term, minor, adverse impacts on soil resources.

Recreation and transportation actions would remove roadside parking adjacent to the Wawona Store; increase the number of picnic benches adjacent to the Wawona Store; and install public recreational amenities, including a trail, restrooms, and waste disposal to facilitate and improve public access to the

Merced River at Wawona Swinging Bridge. The removal of roadside parking would decompact and improve soils conditions, while the installation of picnic benches adjacent to the Wawona Store could lead to further compaction of soils and greater susceptibility to erosion. The installation of public recreational amenities would directly disturb soil resources in small, discrete areas associated with facility installation, and may bring additional visitors to the riverbanks, which could lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the area affected would be small and localized, and the soils present in the area are not particularly sensitive or unique. Further, the establishment of a formal river access point would decrease erosion in the riverbank at a local level by directing visitors to hardened formal trails. For these reasons, recreation and transportation actions would result in local, long-term, minor, adverse impacts on soil resources.

**Wawona.** The redesign of a bus stop to accommodate visitor use would have local, long-term, negligible, adverse impacts on geohazards and soil resources as it would result in only a nominal (if any) increase in the developed area, and would not create new geohazards, or increase public risk or exposure to existing geohazards.

**Segments 5, 6, 7 and 8 Impact Summary:** With mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 5-8 would result in local, long-term, minor, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have local, long-term, minor adverse impacts on soil resources, and local, long-term, negligible, adverse, geohazards impacts.

### **Summary of Impacts Common to Alternatives 2–6**

In segmentwide and parkwide contexts, actions common to Alternatives 2–6 would result in long-term, negligible adverse impacts with respect to exposure of facilities and visitors to geohazards. Exposure to geohazards under Alternatives 2–6 is not completely avoidable, and park visitors, facilities, and workers would remain exposed to some level of risk from the adverse effects of rock fall and earthquakes, even if such risks are minimized through (1) implementation of proper building codes that ensure structures are designed to withstand the effects of an earthquake, and (2) the continuing practice of placing new or relocated park facilities outside of rock-fall hazard zones in Segment 2.

In addition, actions common to Alternatives 2–6 would result in short-term, minor, adverse impacts, and long-term, minor, beneficial impacts with respect to soil resources in both segmentwide and parkwide contexts. Soil excavations and disturbances associated with short-term construction activities for facility actions and interim disturbances necessary for restoration actions would briefly have minor adverse impacts on soil resources, provided mitigation measures MM-GEO-1 and 2, and MM-HYD-1 are implemented to minimize short-term soil erosion impacts to negligible.

In the long term, all restoration actions, numerous facility actions, and some transportation actions would have local, minor to moderate, beneficial effects on soil resources through decompaction and restoration of informal trails; removal of old fills, infrastructure, piping, and riprap in previously

developed campgrounds and riverbanks; meadow restoration; and potential public-access restrictions to allow natural processes to continue unimpeded.

The actions described above would result in a general reduction in the dispersal of park visitors; and may result in a greater density of people along formal trails and access points during periods of peak visitation. Nevertheless, public visitation to the park would continue to occur in the same general location, and therefore the type and level of public exposure to geohazards would remain similar. Under crowded conditions, fencing, signage, area closures, and informal trail removal might not fully eliminate continuing public impacts on soil resources outside of formal public access areas. The actions common to Alternatives 2–6 would nevertheless result in an appreciable reduction in current levels of adverse impacts on soil resources.

### ***Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Visitor use management actions would implement a day-use reservation system that would require day use permits to enter the park and allow day use levels to be more closely managed. This visitor-use management measure would result in fewer daily park visitors and thus would decrease the overall exposure of park visitors to rock-fall hazards (13,900 visitors under Alternative 2 compared with 20,900 visitors under Alternative 1). These actions would result in parkwide, long-term, moderate beneficial impacts with respect to exposure of park visitors to geohazards.

**Soils.** Visitor-use management actions would implement a day-use parking permit system for the East Yosemite Valley. Management of day use in the park, especially during periods of peak visitation, may reduce the extent and severity of crowded conditions, and thus could result in less use of informal trails by visitors seeking alternative routes to popular destinations. However, the beneficial effects of the management action on soil resources would be difficult to quantify or distinguish from the beneficial effects of ecological restoration actions common to all alternatives and proposed under Alternative 2. Nevertheless, visitor use management actions would have a local, long-term, minor, beneficial impact on soil resources.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** The park would remove the Merced Lake East Meadow from grazing permanently and require all administrative pack stock passing through the Merced Lake Area to carry pellet feed. These actions would reduce overgrazing of the meadow, increase natural vegetative cover, and reduce potential erosion resulting from exposed soil. The resulting impact on soil resources would be local, long-term, negligible, and beneficial.



*Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards.** Overnight accommodation and restoration actions would convert Little Yosemite Valley camping area to dispersed camping and remove infrastructure, allow only limited dispersed camping at Merced Lake and remove supporting infrastructure, and discontinue designated camping at Moraine Dome and convert it to dispersed camping. The removal of minor structures would result in a local, long-term, negligible, beneficial impact with respect to visitor and facility exposure to geohazards.

**Soils.** In addition to those actions described for Geohazards, above, overnight accommodation actions would also reallocate Little Yosemite Valley zone capacity from 150 to 25 and trailhead quotas would be adjusted down, reducing the number of visitors. These actions together would have local, long-term, minor, beneficial impacts on soil resources by reducing the stresses on soils from visitor uses, overnight camping, and presence of infrastructure.

Pack stock used for administrative purposes would no longer graze on meadow vegetation near the Merced Lake Ranger Station. All administrative pack stock passing through the area would instead be required to carry pellet feed. This would help restore vegetative cover and reduce erosion potential. This would result in a local, long-term, negligible, beneficial impact on soil resources.

**Merced Lake High Sierra Camp.** Actions in the Merced Lake High Sierra Camp area proposed under Alternative 2 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and the expansion of dispersed camping at Merced Lake Backpackers Camping Area into the High Sierra Camp footprint. These actions would not affect existing levels of public risk or exposure to geohazards, but would have a local, long-term, minor, beneficial impact on soil resources by reducing stresses on soils from visitor uses, overnight camping, and presence of infrastructure.

**Segment 1 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to manage user capacities, land use, and facilities within Segment 1 would result in a local, long-term, negligible, beneficial geohazard impact. These actions would also have a local, long-term, minor, beneficial impact on soil resources.

**Segment 2: Yosemite Valley***Impacts of Actions to Protect and Enhance River Values*

**Soils.** Efforts to restore natural river processes that characterize low-gradient meandering river valleys, to enhance the free-flowing condition of the river, and to remove and decompact soils under former campgrounds would have beneficial effects on soil resources, particularly meadow soils, by removing past human alterations, restoring natural topographic contours, and allowing natural processes to operate unimpeded (e.g., seasonal meadow flooding). Restoration actions would result in the restoration of approximately 55 acres of meadow and riparian habitat, and 3,335 linear feet of roads and trails would be removed or relocated outside of the floodplain. Particularly where campsites and infrastructure in the floodplain would be removed, these local areas would experience substantial beneficial impacts with respect to soil resources, as these areas would be ecologically restored and soils

would begin to recover under continuing natural processes. Combined with the removal of informal trails (approximately 6 miles) and establishment of formal/resilient river access points, both of which are common to Alternatives 2-6, restoration actions associated with Segment 2 would result in local, long-term, moderate beneficial impacts with respect to soil resources. On a segmentwide level, impacts would be long-term, minor and beneficial.

**Biological Resource Actions.** Specific actions include rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive that bisects Ahwahnee Meadow (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive that bisects Stoneman Meadow, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing development, asphalt, and fill material, and restoring 35.6 acres of floodplain at the former Upper and Lower River campgrounds; removing valley campsites and infrastructure from the 100-year floodplain and restoring 25.1 acres of floodplain and riparian habitat; and removing informal trails, reducing formal parking, and installing signage and fencing to redirect visitor traffic at El Capitan Meadow. The benefits of these actions are similar to those described above and include the restoration of soils to natural conditions. Restoration activities would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

**Hydrologic/Geologic Resource Actions.** Specific projects include relocating unimproved Camp 6 parking out of the 10-year floodplain and rerouting a portion of Northside Drive that bisects Ahwahnee Meadow; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. These actions would improve soil conditions by removing asphalt and other imported materials and revegetating areas with native species, allowing soils to return to more natural conditions. Restoration activities would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Overnight accommodation and facility actions would affect the availability, location, and style of overnight accommodations in Yosemite Valley. In keeping with the 2012 Yosemite Valley Geologic Hazard Guidelines, no new campsites or lodging would be located in the rock-fall hazard zone. Tent and hard-sided cabins would be removed from floodplain and rock-fall hazard zones. These actions would avoid increased exposure of park visitors and facilities to rock fall and would reduce the number of structures subject to earthquake damage. Further, visitor-use management actions would result in a substantial reduction in both day and overnight visitors in the valley, and would lead to a general reduction in public exposure to rock fall events. Together, the overnight accommodation, visitor use management, and facilities actions would result in segmentwide, long-term, moderate, beneficial impacts with respect to exposure of park visitors and facilities to geohazards.

**Soils.** Facility actions would remove or reduce lodging and tent cabins in areas currently subject to natural hazards (including removal of tent cabins from the 100-year floodplain), remove existing buildings, construct new concessioner housing areas, and construct new parking spaces. The removal of buildings and tent cabins would improve soils conditions and allow for soils to support plant growth resulting in local, long-term, minor, beneficial impacts. New concessioner housing and parking would

directly affect soils through compaction and paving, and possibly increase pedestrian use of the area that would make soils more susceptible to erosion; thus, new facility development would result in local, long-term, minor, adverse impacts.

Transportation actions would construct, reroute, relocate, and formalize parking spaces. Construction of new parking spaces would directly affect soil resources in the area through installation, compaction, and paving. Parking spaces currently located in the 10-year floodplain would be removed and relocated, and soils beneath these areas would be restored to approximately their preconstruction condition. Relocated parking spaces would be equal or similar in size to current parking areas, would be designed and implemented to improve drainage and minimize runoff, and would not overlie sensitive or unique soils. Overall, parking spaces would be reduced in comparison to existing conditions and the use of informal overflow parking areas would be reduced. Therefore, these actions would have a local, long-term, moderate, beneficial effect on soil resources.

Overnight accommodation actions would affect the availability, location, and style of overnight accommodations in Yosemite Valley, and would require an overall decrease in the number of overnight visitors. The overnight accommodation actions would generally result in a decrease in the number of substantial structures, since the total number of overnight accommodations would decrease, and new/relocated accommodations would be tent campsites. Further, several of the actions to manage user capacity, land use, and facilities would involve ecological restoration of disturbed or developed areas. The effects on soil resources of reducing overnight accommodations and restoring various areas would be beneficial because soil stresses (e.g., compaction and erosion) would be reduced with less visitor use, and restored areas would return soils to their preconstruction condition and allow them to support native vegetation. These actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

Visitor-use management actions would generally result in a substantial reduction in both day and overnight visitor use in the valley. These actions would result in a decreased potential for crowding and could reduce the level and intensity of informal trailing in the valley. These actions would have a segmentwide, long-term, minor, beneficial impact with respect to soil resources.

**Curry Village & Campgrounds.** Actions under Alternative 2 in Segment 2 include the construction of 78 hard-sided units at Boy's Town and the improvement of the Curry Orchard day-use parking area. In addition, campsites at the Lower, Upper, and North Pines Campgrounds would be removed from the Merced River floodplain (specific campground modifications are addressed in the context of actions to protect and enhance river values, above). Cabin construction at Boy's Town and the improvements planned for the Curry Orchard parking lot would require the use of heavy machinery (e.g., tractors, heavy-duty trucks, and demolition equipment) and result in local, short-term soil disturbances through soil compaction and mixing. Facility construction, demolition activities, and/or use of material and equipment staging areas could, in certain areas, result in the loss of soil function.

However, most construction and demolition activities would occur in locations that are already developed, and use of undeveloped areas that have soils supporting native vegetation would be avoided during construction. Nevertheless, it is estimated that the permanent disturbance area associated with these actions would amount to approximately 8.5 acres within the Curry Orchard

parking lot and Boy's Town. The three soil units mapped in this area are (1) the Happyisles-Half Dome complex, 5 to 15 percent slopes, mesic; (2) the Happyisles complex, 1 to 5 percent slopes, mesic; and (3) the Happyisles sandy loam, 0 to 3 percent slopes, somewhat poorly drained, mesic. These soil types typically support mixed conifers (i.e., ponderosa pine, incense cedar, and black oak) with an understory of grasses, shrubs, and ferns. These soils are relatively resilient to disturbance, especially compared to sensitive meadow soils. Much of the permanent disturbance area has already been subject to various levels of development and/or soil compaction due to the existing presence of structures, paved parking and roads, trails, and generally high levels of visitor and concessioner use. Like many of the actions involving permanent soil disturbances due to construction of new facilities, the local impacts would be more than offset by the beneficial impacts of actions to protect and enhance river values (discussed above). This is mostly because many of the actions involving construction of new facilities are for the purpose of accommodating or replacing the visitor-serving facilities, overnight accommodations, and infrastructure requiring removal under floodplain and meadow restoration actions.

Further, to address short-term construction-related impacts, the NPS, as part of standard procedure, would require submittal of a Storm Water Pollution Prevention Plan, a Hazardous Materials Spill Prevention and Response Plan, and would require that NPS workers and/or its contractor(s) to incorporate standard resource protection measures prior to approval of any work for projects in the park. Such measures include, but are not limited to: (1) fencing off or flagging sensitive areas and resources, (2) the inventory, salvage, and/or protection in place of native trees, shrubs, vines, grasses, and other vegetative features, (3) preserving and stockpiling native topsoil for use in post-construction reclamation of temporarily disturbed areas, and (4) implementation of water quality protection measures and hazardous materials spill prevention and response measures. Finally, projects NPS land would not be allowed to proceed without demonstrating compliance with the following Federal and State permits, where applicable: (1) U.S. Army Corps of Engineers nationwide permits for activities affecting wetlands and waters of the U.S., (2) a technically-conditioned Certification issued by the California Regional Water Quality Control Board for construction-related activities affecting the Merced River, (3) the State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities, and (4) the California Regional Water Quality Control Board Clean-Up and Abatement Order, No. 5 00-703, dated 2 August 2000, and a Time Schedule Order which directs Yosemite National Park to prevent discharges of untreated wastewater.

For these reasons, actions under Alternative 2 in the Curry Village and Campgrounds areas would result in local, short-term, minor, adverse impacts on soil resources, but a local, long-term, minor, beneficial impact through removal of informal and paved parking areas and infrastructure from the meadow and floodplain.

**Camp 6 & Yosemite Village.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities within the Camp 6 and Yosemite Village areas include removal of the Concessioner General Office, Concessioner Garage, Arts and Activities Center (former bank building), and repurpose of the Village Sport Shop as a visitor contact station; and measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center parking area would be formalized with 550 parking spaces by redeveloping part of the complex's existing footprint.

One hundred parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and outside of the 10-year floodplain. Fill material would be removed from the floodplain and the area's meadow and floodplain ecosystems would be restored. Relocation and construction of the parking areas and parts of Northside Drive that impact meadow areas would result in local, long-term, minor, adverse effects on soil resources, depending on site-specific conditions and project design.

Most construction and demolition activities would occur in locations that are already developed, and use of undeveloped areas that have soils supporting native vegetation would be avoided during construction. Nevertheless, it is estimated that the permanent disturbance area associated with these actions would amount to approximately 22 acres within the Camp 6/Village Center Parking Area. The three soil units mapped in this area are (1) the Happyisles complex, 1 to 5 percent slopes, mesic; (2) the Leidig fine sandy loam, 0 to 2 percent slopes, occasionally flooded, mesic; and (3) the Elcapitan fine sandy loam, 0 to 2 percent slopes, mesic. The Happyisles complex typically supports mixed conifers (i.e., ponderosa pine, incense cedar, and black oak) with an understory of grasses, shrubs, and ferns. The Leidig and Elcapitan soils are seasonally flooded and support a wide range in vegetation, from woodland to facultative hydrophytes with grasses and forbs as understory. The Leidig and Elcapitan soils are considered sensitive meadow/wetland soils; however, in this location have been disturbed by development and encroached upon by conifers. The Happyisles complex is relatively resilient to disturbance, especially compared to sensitive meadow soils.

Much of the permanent disturbance area has already been subject to various levels of disturbance and/or compaction due to the existing presence of structures, paved parking and roads, trails as well as generally high levels of visitor use. Like many of the actions involving permanent soil disturbances due to construction of new facilities, the localized impacts are more than offset by the beneficial impacts of actions to protect and enhance river values (discussed above). Further, to address short-term construction-related impacts, the NPS, as part of standard procedure, would require submittal of a Storm Water Pollution Prevention Plan, a Hazardous Materials Spill Prevention and Response Plan, and would require that NPS workers and/or its contractor(s) to incorporate standard resource protection measures prior to approval of any work for projects in the park. Such actions are more fully described above.

For these reasons, actions under Alternative 2 in the Camp 6 and Yosemite Village areas would result in local, short-term, minor, adverse impacts on soil resources, but a local, long-term, moderate, beneficial impact through relocation of park facilities to a greater distance from meadow areas and the Merced River floodplain.

**Yosemite Lodge & Camp 4.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities within the Yosemite Lodge and Camp 4 areas include: (1) the conversion of Yosemite Lodge to a day-use facility and the addition of 250 parking spaces; (2) construction of a new comfort station; (3) redevelopment west of Yosemite Lodge to provide parking for additional 150 automobiles and 15 busses; (4) the conversion of Highland Court to a walk-in campground; and (5) the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.

The type, level, and intensity of impacts to soil resources in this location are similar to those discussed above for the Curry Village area. The three soil units mapped in this area are (1) the Happy Isles complex, 1 to 5 percent slopes, mesic; (2) the Leidig fine sandy loam, 0 to 2 percent slopes, occasionally flooded, mesic; and (3) the Elcapitan fine sandy loam, 0 to 2 percent slopes, mesic. Approximately 13 acres would experience permanent disturbance under this alternative. However, much like actions in the Curry Village area, the location of permanent disturbance would be within resilient soils and is, in most locations, already impacted by various levels of development, compaction, and visitor use.

For the same reasons discussed above for the Curry Village area, actions under Alternative 2 in the Yosemite Lodge and Camp 4 areas would result in local, short-term, minor, adverse impacts on soil resources, but a local, long-term, moderate, beneficial impact through relocation of park facilities farther from meadow areas and the Merced River floodplain.

**Segment 2 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 2 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would also have long-term, local, minor to moderate, beneficial impacts on soil resources, and a segmentwide, moderate, beneficial geohazards impact.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Value***

**Soils.** Oak protection areas would be designated in the Odgers' fuel storage area and adjacent parking areas. Parking and new building construction would be prohibited within the dripline. A 2.25 acre oak recruitment area would be established near the fuel storage area, within which nonnative fill would be removed and decompacted, invasive species would be removed, and native understory plants would be planted. This action would benefit soil resources by removing current stressors (e.g., parking and foot traffic) and restoring soil function (through decompaction and replanting). This would have a long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Facility, overnight accommodation, and transportation actions would install high-density housing units and campsites in Abbieville and Trailer Village, and Rancheria Flatt in El Portal. Construction of all new structures would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can be reasonably anticipated in the region. These actions would result in a long-term, local, negligible, adverse impact with respect to geohazards in Segments 3 and 4.

**Soils.** Overnight accommodation, transportation, and facility actions would install new campsites and high-density housing units in the Abbieville, El Portal Trailer Village, and Rancheria Flatt areas. The installation of these facilities would directly disturb soil resources in small discrete areas through installation, compaction, and paving, and would also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the areas affected would be small and localized and, with regard to the former, the proposed facilities would be redeveloped within the existing footprint of the Abbieville and El Portal Trailer Village areas. Therefore, these actions would result in a long-term, local, minor, adverse impact on soil resources.

**Segments 3 & 4 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 3 & 4 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, adverse impacts on soil resources, and long-term, local, negligible, adverse geohazard impacts.

### **Segments 5, 6, 7 and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Actions to protect and enhance river values include removal of the Wawona Golf Course. This action would allow soils to regrow vegetation and resume their natural function. The golf course represents a large and contiguous area where restoration would allow for native vegetation to return to the areas and is likely to result in significant benefits to both soil and water quality. The action would have a local, long-term, moderate beneficial impact on the soils in the floodplain.

**Biological Resource Actions:** Project specific actions include relocation of stock use campsites from a culturally sensitive area to Wawona Stables. This action would shift impacts associated with stock camping to an already disturbed area, resulting in a local, long-term, minor, beneficial impact.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Actions to manage user capacity, land use and facilities would eliminate stables and day rides from the Wawona stables, and relocate the stock use campground. Soil stresses (e.g., compaction and erosion) would be decreased due to the elimination of stable rides. These actions would have a local, long-term, minor, beneficial impact on soils in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 32 sites that are either within the 100-year floodplain or in culturally sensitive areas. Removal of campground infrastructure (such as bear boxes, sign posts, etc.) would temporarily cause a minor increase in soil disturbance; however, in the long-term these areas would recover from past visitor- and recreational-related stresses (such as continuing soil compaction at campsites and access roads). The areas in the floodplain would slowly recover to natural conditions under continuing natural processes. The overall long-term impact would be local, moderate, and beneficial.



**Segments 5, 6, 7 and 8 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 5-8 would result in local, long-term, minor, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have local, long-term, minor-to-moderate beneficial impacts in specific areas. In a segmentwide context, these actions would have long-term, minor to moderate, beneficial impacts on soil resources.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

In segmentwide and parkwide contexts, Alternative 2 would result in long-term, minor to moderate, beneficial impacts with respect to exposure of facilities and visitors to geohazards. Adherence to applicable building codes (in all segments) and implementation of the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2) would ensure that new or relocated structures are designed to withstand an earthquake and are located outside of the rock-fall hazard zone. On a local level, such as the Curry Village area and Camp 4, Alternative 2 would result in long-term, moderate, beneficial impacts with respect to exposure of facilities and visitors to geohazards.

In addition, actions common to Alternatives 2–6 would result in short-term, minor, adverse impacts, and long-term, moderate, beneficial impacts with respect to soil resources in both segmentwide and parkwide contexts. Alternative 2 would generally result in a decrease in the level of park visitation and thus result in a general reduction in visitor impacts on soil resources from informal trailing and campground use and activities in sensitive floodplain areas, such as meadows and riparian zones. Visitors would be directed to formal routes and trails where soils are already paved, compacted, or otherwise affected. Also, the Wawona Golf Course would be removed and partially restored as a sprayfield for reclaimed water.

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

The relevant past, present and reasonably foreseeable future projects for the cumulative discussion are the same as those discussed for Alternative 1. Past and present projects and management plans, which include the existence and maintenance of facilities within rock fall hazard areas, when considered with Alternative 2, would still expose park visitors and employees to injury and damage from earthquakes and rock falls. Continued stabilization and rehabilitation work would reduce impacts in targeted areas, which would be a long-term, beneficial impact. Actions under Alternative 2 would adhere to applicable building codes (in all segments) and the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2 only). At a parkwide level, Alternative 2, in combination with past, present, and reasonably foreseeable future projects, would result in a negligible, adverse, cumulative effect with respect to exposure of park visitors and facilities to geohazards.

Cumulatively, a combination of adverse and beneficial impacts on soil resources would occur under Alternative 2. The net effect of these actions are difficult to anticipate, but would likely result in beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) that would outweigh adverse impacts (which would generally be short term

or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternatives 2 would result in a parkwide, minor to moderate, beneficial, cumulative impact.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Visitor use levels under Alternative 3 would be less than those of Alternative 1 (13,200 visitors under Alternative 3 compared with 20,900 visitors under Alternative 2) and would decrease the overall exposure of park visitors to rock fall hazards under existing conditions. Therefore, these actions would result in parkwide, long-term, moderate beneficial impacts with respect to exposure of park visitors to geohazards.

**Soils.** Similarly, reduced visitation, especially during the peak season, may reduce the extent and severity of crowded conditions, and thus could result in less use of informal trails by visitors seeking alternative routes to popular destinations. Visitor use actions thus would have a local, long-term, minor, beneficial impact on soil resources.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced under Alternative 3, thereby promoting dispersed camping. Concentrated camping areas would be converted to dispersed camping. This would reduce the potential for informal trails and vegetation trampling, thereby leading to improved soil character and integrity. As such, these actions would have a long-term, local, minor, beneficial impact on soil resources by resulting in a slight reduction in the stresses on soils from visitor uses, overnight camping, and presence of infrastructure.

Pack stock used for administrative purposes would graze on meadow vegetation near the Merced Lake Ranger Station in accordance with established grazing capacities. This would reduce overgrazing of the meadow, increase natural vegetative cover, and reduce potential erosion resulting from exposed soil. The resulting impact on soil resources would be local, long-term, negligible, and beneficial.

**Merced Lake High Sierra Camp.** Actions in the Merced Lake High Sierra Camp area proposed under Alternative 3 involve the conversion of the area to designated Wilderness, removal of all infrastructure from the Merced Lake High Sierra Camp, and use of the former camp area as a temporary stock camp. These actions would not affect existing levels of public risk or exposure to geohazards, but would have local, long-term, minor, beneficial impacts on soil resources by reducing stresses on soils from visitor uses and presence of infrastructure.

**Segment 1 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to manage user capacities, land use, and facilities within Segment 1 would result in local, long-term, minor, beneficial impact on soil resources.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Under Alternative 3, the Stoneman, Sugar Pine and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. These sites would have reduced scour, more stable riverbanks, and improved vegetative recruitment. In the local areas where these actions would be performed, they would have long-term, moderate, beneficial impacts on soil resources.

Under Alternative 3, campsites and associated infrastructure located within 150 feet of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, and Yellow Pine Campgrounds. All tent-style lodging at Housekeeping Camp would be removed and the area would be repurposed as river access. Approximately 10.9 acres of riparian ecosystem would be restored at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Methods for restoration would include recontouring, ditch removal, and decompaction.

Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil, as decompaction occurs, with an excavator or dozer with winged rippers. These actions would have a short-term, minor, adverse impact on soil resources due to the trampling of vegetation and compaction of soil by heavy equipment. After construction, restored areas would result in established vegetation that would be less likely to erode and improve soil function. The resulting impacts would be long-term, moderate, and beneficial.

Under Alternative 3, river access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable Merced River access points throughout the segment, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, thereby reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on soil resources.

**Biological Resource Actions.** Specific projects include rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive that bisects Ahwahnee Meadow (900 feet) and

rerouting the bike path; removing 1,335 feet of Southside Drive that bisects Stoneman Meadow, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing development, asphalt, and fill material, and restoring 35.6 acres of floodplain at the former Upper and Lower River campgrounds; removing valley campsites and infrastructure from within 150 feet of the river and restoring an additional 12 acres of riparian habitat; and removing informal trails and installing signage and fencing to redirect visitor traffic at El Capitan Meadow. The benefits of these actions include removal of past human alterations, soil decompaction, and restoration of natural topographic contours and soil function. As a result, these actions would have long-term, moderate, beneficial impacts with respect to soil resources.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 3 include: relocating unimproved Camp 6 parking out of the 10-year floodplain; removing the Stoneman, Ahwahnee and Sugar Pine Bridges to enhance free-flowing condition; and restoring these areas to natural conditions. These actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards.** No new campsites or lodging would be located in the rock-fall hazard zone. Structures would be reduced since facilities would be removed from the valley, tent cabins would be removed from floodplain and rock-fall hazard zone. These actions would avoid increased exposure of park visitors and facilities to rock fall and would reduce the number of structures subject to earthquake damage. Further, visitor-use management actions would result in a substantial reduction in both day and overnight visitors in the valley, and would lead to a general reduction in public exposure to rock fall events. Together, the overnight accommodation, visitor use management, and facilities actions would result in segmentwide, long-term, moderate, beneficial impacts with respect to exposure of park visitors and facilities to geohazards.

**Soils.** Facility actions would remove or reduce lodging and tent cabins in areas currently subject to natural hazards (including removal of tent cabins from the 100-year floodplain), remove existing buildings, construct new concessioner housing areas, and construct new parking spaces. The removal of buildings and tent cabins would improve soils conditions and allow for soils to support plant growth resulting in local, long-term, minor, beneficial impacts. New concessioner housing and parking would directly affect soils through compaction and paving, and possibly increase pedestrian use of the area that would make soils more susceptible to erosion; thus, new facility development would result in local, long-term, minor, adverse impacts.

Transportation actions would construct, reroute, relocate, and formalize parking spaces. Construction of new parking spaces would directly affect soil resources in the area through installation, compaction, and paving. Parking spaces currently located in the 10-year floodplain would be removed and relocated, and soils beneath these areas would be restored to approximately their preconstruction condition. Relocated parking spaces would be equal or similar in size to current parking areas, would be designed and implemented to improve drainage and minimize runoff, and would not overlie sensitive or unique soils. Overall, parking spaces would be reduced in comparison to existing conditions and the use of informal

overflow parking areas would be reduced. Therefore, these actions would have a local, long-term, moderate, beneficial effect on soil resources.

Overnight accommodation actions would affect the availability, location, and style of overnight accommodations in Yosemite Valley, and would require an overall decrease in the number of overnight visitors. The overnight accommodation actions would generally result in a decrease in the number of substantial structures, since the total number of overnight accommodations would decrease, and new/relocated accommodations would be tent campsites. Further, several of the actions to manage user capacity, land use, and facilities would involve ecological restoration of disturbed or developed areas. The effects on soil resources of reducing overnight accommodations and restoring various areas would be beneficial because soil stresses (e.g., compaction and erosion) would be reduced with less visitor use, and restored areas would return soils to their preconstruction condition and allow them to support native vegetation. These actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

Visitor-use management actions would generally result in a substantial reduction in both day and overnight visitor use in the valley. These actions would result in a decreased potential for crowding and could reduce the level and intensity of informal trailing in the valley. These actions would have a segmentwide, long-term, minor, beneficial impact with respect to soil resources.

**Curry Village & Campgrounds.** The park would retain 355 guest units at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These projects would permanently disturb approximately 8.5 acres of soils (Happyisles-Half Dome complex, Happyisles complex, and Happyisles sandy loam). As such, the specific projects proposed under Alternative 3 for the Curry Village and Campgrounds areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, minor, beneficial impacts through removal of informal and paved parking areas, and infrastructure from the meadow and floodplain.

**Camp 6 & Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These projects would permanently disturb approximately 22 acres of soils (Happyisles complex, Leidig fine sandy loam, and Elcapitan fine sandy loam). As such, the specific projects proposed under Alternative 3 for the Camp 6 and Yosemite Village areas would result in short-term, minor adverse impacts on soil resources, but local, long-term, moderate, beneficial impacts through relocation of park facilities farther from meadow areas and the Merced River floodplain.

**Yosemite Lodge & Camp 4.** The park would move on-grade pedestrian crossing to west of the Northside Drive and Yosemite Lodge Drive, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 7 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These projects would permanently disturb approximately 16 acres of soils (Happyisles complex). Specific projects proposed under Alternative 3 for the Yosemite Lodge and Camp 4 areas would result in local, short-term, minor, adverse impacts on soil resources, but long-term, minor, beneficial impacts through relocation of park

facilities to a greater distance from meadow areas and the Merced River floodplain and through consolidation of accommodations to fewer, less scattered locations.

**Segment 2 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 2 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would also have long-term, local, minor to moderate, beneficial impacts on soil resources; and long-term, segmentwide, moderate, beneficial geohazards impacts.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Oak protection areas would be designated in the Odgers' fuel storage area and adjacent parking areas. Parking and new building construction would be prohibited within the dripline. A 2.25 acre oak recruitment area would be established near the fuel storage area, within which nonnative fill would be removed and decompacted, invasive species would be removed, and native understory plants would be planted. This action would benefit soil resources by removing current stressors (e.g., parking and foot traffic) and restoring soil function (through decompaction and replanting). This would have a long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** High-density housing units would be constructed at Rancheria Flatt in El Portal. Construction of all new structures would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can be reasonably anticipated in the region. These actions would result in a long-term, local, negligible, adverse impact with respect to geohazards in Segments 3 and 4.

**Soils.** The installation of new housing at Rancheria Flatt would directly disturb soil resources in small discrete areas through installation, compaction, and paving, and would also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the areas affected would be small and localized. Therefore, these actions would result in a long-term, local, minor, adverse impact on soil resources.

At Abbieville and El Portal Trailer Village, the park would remove or relocate existing housing and restore the floodplain. Sensitive soils along the floodplain would be restored to their preconstruction condition and would support native vegetation. These actions would have long-term, minor beneficial impact on soils at the local level.

**Segments 3 & 4 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within

Segment 4 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, adverse impacts on soil resources; long-term, local, negligible, adverse geohazard impacts.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Actions to protect and enhance river values include removal of the Wawona Golf Course. This action would allow soils to regrow vegetation and resume their natural function. The golf course represents a large and contiguous area where restoration would allow for native vegetation to return to the areas and is likely to result in significant benefits to both soil and water quality. The action would have a local, long-term, moderate beneficial impact on the soils in the floodplain.

**Biological Resource Actions.** Project specific actions include relocation of stock use campsites from a culturally sensitive area to Wawona Stables. This action would shift impacts associated with stock camping to an already disturbed area, resulting in a local, long-term, minor, beneficial impact.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Actions to manage user capacity, land use and facilities would eliminate stables and day rides from the Wawona stables, and relocate the stock use campground. Soil stresses (e.g., compaction and erosion) would be decreased due to the elimination of stable rides. These actions would have a local, long-term, minor, beneficial impact on soils in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. Removal of campground infrastructure (such as bear boxes, sign posts, etc.) would temporarily cause a minor increase in soil disturbance; however, in the long-term these areas would recover from past visitor- and recreational-related stresses (such as continuing soil compaction at campsites and access roads). The areas in the floodplain would slowly recover to natural conditions under continuing natural processes. The overall long-term impact would be local, minor to moderate, and beneficial.

**Segments 5-8 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 5-8 would result in local, long-term, minor beneficial impacts on soil resources. With mitigation, actions to manage user capacities, land use, and facilities would have local, long-term, minor to moderate, beneficial impacts on soil resources, and local, long-term, negligible, adverse geohazards impacts.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

In a segmentwide and parkwide context, Alternative 3 would result in long-term, minor to moderate, beneficial impacts with respect to exposure of facilities and visitors to geohazards. Adherence to



applicable building codes (in all segments) and implementation of the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2 only) would ensure that new or relocated structures are designed to withstand an earthquake and are located outside of the rock-fall hazard zone. On a local level, such as the Curry Village area, Alternative 3 would result in long-term, moderate, beneficial impacts with respect to exposure of facilities and visitors to geohazards.

Alternative 3 would generally result in a decrease in the level of park visitation and thus result in a general reduction in visitor impacts on soil resources from informal trail use, campground use, and other activities in sensitive floodplain areas such as meadows and riparian zones. Visitors would be directed to formal routes and trails where soils are already paved, compacted, or otherwise affected. For these reasons, actions under Alternative 3 would result in short-term, minor, adverse impacts (e.g., due to construction/grading), and long-term, moderate, beneficial impacts with respect to soil resources in both segmentwide and parkwide contexts

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Past and present projects and management plans, which include the existence and maintenance of facilities within rock fall hazard areas, when considered with Alternative 3, would still expose park visitors and employees to injury and damage from earthquakes and rock falls. Continued stabilization and rehabilitation work would reduce impacts in targeted areas, which would be a long-term, beneficial impact. Actions under Alternative 3 would adhere to applicable building codes (in all segments) and the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2 only). At a parkwide level, Alternative 3, in combination with past, present, and reasonably foreseeable future projects, would result in a negligible, adverse, cumulative effect with respect to exposure of park visitors and facilities to geohazards.

Cumulatively, a combination of adverse and beneficial impacts on soil resources would occur under Alternative 3. The net effect of these actions are difficult to anticipate, but would likely result in beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) that would outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternatives 3 would result in a parkwide, minor to moderate, beneficial, cumulative impact.

### ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

#### **All River Segments**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Alternative 4 would result in reduced park visitation (17,000 visitors compared with 20,900 visitors under Alternative 1) and would reduce the exposure of park visitors to geohazards

under existing conditions. Therefore, visitor use actions would result in a parkwide, long-term, moderate, beneficial impact with respect to the exposure of park visitors to geohazards.

**Soils.** A decrease in park visitation would reduce the potential for ongoing visitor use impacts on natural resources, such as creation of informal trails, trampling of vegetation, and increased bank erosion. However, visitor use numbers would only be slightly reduced compared with existing conditions, and more visitation would result than under Alternative 2. Nevertheless, these actions would have a local, long-term, minor, beneficial impact on soil resources.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced under Alternative 4, thereby promoting dispersed camping. Concentrated camping areas would be converted to dispersed camping. This would reduce the potential for informal trails and vegetation trampling, thereby leading to improved soil character and integrity. Therefore, these actions would have a long-term, local, minor, beneficial impact on soil resources.

The park would remove the Merced Lake East Meadow from grazing permanently and require all administrative pack stock passing through the Merced Lake Area to carry pellet feed. These actions would reduce overgrazing of the meadow, increase natural vegetative cover, and reduce potential erosion resulting from exposed soil. The resulting impact on soil resources would be local, long-term, negligible, and beneficial.

**Merced Lake High Sierra Camp.** Actions in the Merced Lake High Sierra Camp area proposed under Alternative 4 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and restoration of the former camp area to natural conditions. These actions would not affect existing levels of public risk or exposure to geohazards, but would have local, long-term, minor to moderate, beneficial impacts on soil resources by reducing stresses on soils from visitor uses, overnight camping, and presence of infrastructure.

**Segment 1 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to manage user capacities, land use, and facilities within Segment 1 would result in a local, long-term, minor to moderate, beneficial impact on soil resources.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Under Alternative 4, the Sugar Pine and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. These sites would have reduced scour and more stable riverbanks, more stable riverbanks, and improved vegetative recruitment. In the local

areas where these actions would be performed, they would have long-term, moderate, beneficial impacts on soil resources

Under Alternative 4, all campsites and associated infrastructure within the 100-year floodplain would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pine Campground, and tent-style lodging at Housekeeping Camp. Other facilities that would be removed from the 100-year floodplain include the select Yosemite Lodge infrastructure. Approximately 10.9 acres of riparian ecosystem would be restored at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Methods for restoration would include recontouring, ditch removal, and decompaction.

Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil, as decompaction occurs, with an excavator or dozer with winged rippers. These actions would have a short-term, minor, adverse impact on soil resources due to the trampling of vegetation and compaction of soil by heavy equipment. After construction, restored areas would result in established vegetation that would be less likely to erode and improve soil function. The resulting impacts would be long-term, moderate, and beneficial.

Under Alternative 4, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on soil resources.

**Biological Resource Actions.** Specific projects include removal of fill in trails at Ahwahnee Meadows; installing culverts beneath Northside Drive; removing 1,335 feet of Southside Drive that bisects Stoneman Meadow, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing asphalt and fill material, restoring topography of 19.7 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing valley campsites and infrastructure from within 150 feet of the river and restoring an additional 12 acres of riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails at El Capitan Meadow. The benefits of these actions include removal of past human alterations, soil decompaction, and restoration of natural topographic contours and soil function. As a result, these activities would have local, long-term, minor to moderate, beneficial impacts with respect to soil resources.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 4 include: relocating unimproved Camp 6 parking out of the 10-year floodplain; removal of the Ahwahnee and Sugar Pine Bridges to enhance free-flowing condition; and restoring these areas to natural conditions. These actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** No new campsites or lodging would be located in the rock-fall hazard zone. Structures would be reduced since facilities would be removed from the valley, tent cabins would be removed from floodplain and rock-fall hazard zone. These actions would avoid increased exposure of park visitors and facilities to rock fall and would reduce the number of structures subject to earthquake damage. Further, visitor-use management actions would result in a substantial reduction in both day and overnight visitors in the valley, and would lead to a general reduction in public exposure to rock fall events. Together, the overnight accommodation, visitor use management, and facilities actions would result in segmentwide, long-term, minor to moderate, beneficial impacts with respect to exposure of park visitors and facilities to geohazards.

**Soils.** Facility actions would remove or reduce lodging and tent cabins in areas currently subject to natural hazards (including removal of tent cabins from within 150 feet of the river), remove existing buildings, construct new concessioner housing areas, and construct new parking spaces. The removal of buildings and tent cabins would improve soils conditions and allow for soils to support plant growth resulting in local, long-term, minor, beneficial impacts. New concessioner housing and parking would directly affect soils through compaction and paving, and possibly increase pedestrian use of the area that would make soils more susceptible to erosion; thus, new facility development would result in local, long-term, minor, adverse impacts.

Transportation actions would construct, reroute, relocate, and formalize parking spaces. Construction of new parking spaces would directly affect soil resources in the area through installation, compaction, and paving. Parking spaces currently located in the 10-year floodplain would be removed and relocated, and soils beneath these areas would be restored to approximately their preconstruction condition. Relocated parking spaces would be equal or similar in size to current parking areas, would be designed and implemented to improve drainage and minimize runoff, and would not overlie sensitive or unique soils. Overall, parking spaces would be reduced in comparison to existing conditions and the use of informal overflow parking areas would be reduced. Therefore, these actions would have a local, long-term, negligible, beneficial effect on soil resources.

Overnight accommodation actions would affect the availability, location, and style of overnight accommodations in Yosemite Valley, and would accommodate an overall increase in the number of overnight visitors. A substantial number of campsites would be added to accommodate increased overnight visitation. However, overnight accommodation actions would also result in a decrease in the number of substantial structures. In addition, several of the actions to manage user capacity, land use, and facilities would involve ecological restoration of disturbed or developed areas. The effects on soil resources of increasing camping areas would be long-term, negligible to minor, and adverse. These impacts would likely be outweighed by the benefits of facilities removal and restoration throughout

the segment. The net effect of these actions would be local, long-term, minor to moderate, and beneficial with respect to soil resources.

Visitor-use management actions would contribute to an overall reduction in total daily visitation. These actions would result in a decreased potential for crowding and could reduce the level and intensity of informal trailing in the valley. These actions would have a segmentwide, long-term, minor, beneficial impact with respect to soil resources.

**Curry Village & Campgrounds.** The park would retain 355 guest units and construct a new 40 site campground at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would permanently disturb approximately 8.5 acres of soil (Happyisles-Half Dome complex, Happyisles complex, and Happyisles sandy loam). As such, the specific projects proposed under Alternative 4 for the Curry Village and Campgrounds areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, minor, beneficial impacts through removal of informal and paved parking areas, and infrastructure from the meadow and floodplain.

**Camp 6 & Yosemite Village.** The park would improve the configuration of and on-grade pedestrian crossing at the Northside Drive-Yosemite Village Drive intersection, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 750 parking spaces, and install a three-way intersection connecting the parking lot to Sentinel Drive. These actions would permanently disturb approximately 27 acres of soil (Happyisles complex, Leidig fine sandy loam, and Elcapitan fine sandy loam). As such, actions under Alternative 4 in the Camp 6 and Yosemite Village areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, moderate, beneficial impact through relocation of park facilities farther from meadow areas and the Merced River floodplain.

**Yosemite Lodge & Camp 4.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 7 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These actions would permanently disturb approximately 16 acres of soil (Happyisles complex). As such, actions under Alternative 4 in the Yosemite Lodge and Camp 4 areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, moderate, beneficial impacts through relocation of park facilities farther from meadow areas and the Merced River floodplain.

**Segment 2 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 2 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would also have local, long-term, minor to moderate beneficial impacts on soil resources; and long-term, segmentwide, minor to moderate, beneficial geohazards impacts.

## Segments 3 and 4: Merced Gorge and El Portal

### *Impacts of Actions to Protect and Enhance River Values*

**Soils.** Oak protection areas would be designated in the Odgers' fuel storage area and adjacent parking areas. Parking and new building construction would be prohibited within the dripline. A one-acre oak recruitment area would be established near the fuel storage area, within which nonnative fill would be removed and decompacted, invasive species would be removed, and native understory plants would be planted. This action would benefit soil resources by removing current stressors (e.g., parking and foot traffic) and restoring soil function (through decompaction and replanting). This would have a long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards.** High-density housing units would be constructed at Rancheria Flatt in El Portal. Construction of all new structures would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can be reasonably anticipated in the region. These actions would result in a long-term, local, negligible, adverse impact with respect to geohazards in Segments 3 and 4.

**Soils.** The installation of new housing at Rancheria Flatt would directly disturb soil resources in small discrete areas through installation, compaction, and paving, and would also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the areas affected would be small and localized. Therefore, these actions would result in a long-term, local, minor, adverse impact on soil resources.

At Abbieville and El Portal Trailer Village, the park would remove or relocate existing housing and restore the floodplain. Sensitive soils along the floodplain would be restored to their preconstruction condition and would support native vegetation. These actions would have long-term, minor beneficial impact on soils at the local level.

**Segments 3 & 4 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 4 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, adverse impacts on soil resources; and long-term, local, negligible, adverse geohazard impacts.

## Segments 5, 6, 7 and 8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions:** Project specific actions include relocation of stock use campsites from a culturally sensitive area to Wawona Stables. This action would shift impacts associated with stock camping to an already disturbed area, resulting in a local, long-term, minor, beneficial impact.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Soils.** Actions to manage user capacity, land use and facilities would eliminate stables and day rides from the Wawona stables, and relocate the stock use campground. Soil stresses (e.g., compaction and erosion) would be decreased due to the elimination of stable rides. These actions would have a local, long-term, minor, beneficial impact on soils in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. Removal of campground infrastructure (such as bear boxes, sign posts, etc.) would temporarily cause a minor increase in soil disturbance; however, in the long-term these areas would recover from past visitor- and recreational-related stresses (such as continuing soil compaction at campsites and access roads). The areas in the floodplain would slowly recover to natural conditions under continuing natural processes. The overall long-term impact would be local, minor, and beneficial.

**Segments 5-8 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 5-8 would result in local, long-term, minor beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, beneficial impacts on soil resources, and long-term, local, negligible, adverse geohazards impacts.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

In segmentwide and parkwide contexts, Alternative 4 would result in long-term, minor to moderate, beneficial impacts with respect to exposure of facilities and visitors to geohazards. Adherence to applicable building codes (all segments) and implementation of the 2012 Yosemite Valley Geologic Hazard Guidelines (Segment 2 only) would ensure that new or relocated structures are designed to withstand an earthquake and are located outside of the rock-fall hazard zone. On a local level, such as the Curry Village area, Alternative 4 would result in long-term, moderate, beneficial impacts with respect to exposure of facilities and visitors to geohazards.

Alternative 4 would generally result in a decrease in the total level of park visitation but would increase the level of overnight accommodation compared with Alternative 1 (No Action). This would result in a general reduction in visitor impacts on soil resources from informal trail use and day use, though not necessarily from campground use. However, Alternative 4 would move the location of overnight accommodations away from sensitive meadow and riparian zones. While visitors would be directed to



formal routes and trails in many locations, visitor use impacts on soils in sensitive areas could continue. For these reasons, actions under Alternative 4 would result in short-term, minor, adverse impacts (e.g., due to construction/grading), and long-term, minor, beneficial impacts with respect to soil resources in both segmentwide and parkwide contexts.

#### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Past and present projects and management plans, which include the existence and maintenance of facilities within rock fall hazard areas, when considered with Alternative 4, would still expose park visitors and employees to injury and damage from earthquakes and rock falls. Continued stabilization and rehabilitation work would reduce impacts in targeted areas, which would be a long-term, beneficial impact. Actions under Alternative 4 would adhere to applicable building codes (in all segments) and the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2 only). At a parkwide level, Alternative 4, in combination with past, present, and reasonably foreseeable future projects, would result in a negligible, adverse, cumulative effect with respect to exposure of park visitors and facilities to geohazards.

Cumulatively, a combination of adverse and beneficial impacts on soil resources would occur under Alternative 4. The net effect of these actions are difficult to anticipate, but would likely result in beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) that would outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternatives 4 would result in a parkwide, minor, beneficial, cumulative impact.

#### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

##### **All River Segments**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Visitor use actions under Alternative 5 would result in similar park visitation compared with existing conditions (19,900 visitors compared with 20,900 visitors). The exposure of park visitors to geohazards would continue to be similar to existing conditions; therefore, visitor use actions could result in parkwide, long-term, minor, adverse impacts with respect to visitor exposure to geohazards.

**Soils.** Visitor-use management actions would implement a day-use parking permit system for the East Yosemite Valley. Under Alternative 5, with visitation similar to that of Alternative 1 (No Action) the potential for ongoing visitor use impacts on soil resources, such as creation of informal trails, trampling of vegetation, and soil compaction would continue. However, management of day use in the park, especially during periods of peak visitation, combined with efforts to ecologically restore informal trails and areas of bare ground, to improve fencing, to install signage, and to formalize access to resilient riverbanks, which are common to Alternatives 2–6, would aid in reducing visitor impacts on

soils relative to Alternative 1. While visitor use levels in the park would remain at current levels, such use would have a lesser continuing impacts on soil resources through ecological restoration actions common to Alternatives 2–6. While the specific effects of the management actions on soil resources would be difficult to quantify or distinguish from the beneficial effects of restoration actions common to Alternatives 2–6, they would have a local, long-term, minor, beneficial impact on soil resources.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Visitation within Segment 1 would not be expected to change appreciably under Alternative 5; wilderness access quotas would remain as under Alternative 1 (No Action) (150) and modifications to overnight accommodations would be nominal. The resulting impacts on soil resources would be similar to those of Alternative 1; local, long-term, minor, and adverse.

Pack stock used for administrative purposes would graze on meadow vegetation near the Merced Lake Ranger Station in accordance with established grazing capacities. This would reduce overgrazing of the meadow, increase natural vegetative cover, and reduce potential erosion resulting from exposed soil. The resulting impact on soil resources would be local, long-term, negligible, and beneficial.

**Merced Lake High Sierra Camp.** Actions in the Merced Lake High Sierra Camp area proposed under Alternative 5 involve retention of the Merced Lake High Sierra Camp, reducing the capacity to 42 beds, and replacing the flush toilets with composting toilets. These actions would not affect existing levels of public risk or exposure to geohazards, but would have local, long-term, negligible, beneficial impacts on soil resources by reducing stresses on soils from visitor use and presence of infrastructure.

**Segment 1 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to manage user capacities, land use, and facilities within Segment 1 would result in local, long-term, minor, beneficial impacts on soil resources.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Under Alternative 5, the Sugar Pine Bridge would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. These sites would have reduced scour and more stable riverbanks, and reduce visitor use pressures within riparian areas. This would result in a local, long-term, negligible, beneficial impact on soil resources. In the local areas where these actions would be performed, they would have long-term, moderate, beneficial impacts on soil resources

Under Alternative 5, all campsites and associated infrastructure within 100 feet of the ordinary high-water mark of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pine Campground, and tent-style lodging units at Housekeeping Camp.

Approximately 10.9 acres of riparian ecosystem would be restored at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed).

Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Methods for restoration would include recontouring, ditch removal, and decompaction.

Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil as decompaction occurs, using an excavator or dozer with winged rippers. These actions would have a short-term, minor, adverse impact on soil resources due to the trampling of vegetation and compaction of soil by heavy equipment. After construction, restored areas would result in established vegetation that would be less likely to erode and improve soil function. The resulting impacts would be long-term, minor to moderate, and beneficial.

Under Alternative 5, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at Merced River access points, thus reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on soil resources.

**Biological Resource Actions.** Specific projects include removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; removing asphalt and fill material, restoring topography of 35.6 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing valley campsites and infrastructure from within 100 feet of the river and restoring an additional 6.5 acres of riparian habitat; and removing informal trails and erecting fencing, signage, and boardwalks to redirect visitor traffic, and selectively removing conifers to improve views at El Capitan Meadow. The benefits of these actions include removal of past human alterations, soil decompaction, and restoration of natural topographic contours and soil function. As a result, these activities would have local, long-term, minor to moderate, beneficial impacts with respect to soil resources.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 5 include: relocating unimproved Camp 6 parking out of the 10-year floodplain; removal of the Sugar Pine Bridge to enhance free-flowing condition; and restoring these areas to natural conditions. These actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

*Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards.** No new campsites or lodging would be located in the rock-fall hazard zone. Structures would be reduced since facilities would be removed from the valley, tent cabins would be removed from floodplain and rock-fall hazard zone. These actions would avoid increased exposure of park visitors and facilities to rock fall and would reduce the number of structures subject to earthquake damage. Further, visitor-use management actions would result in a substantial reduction in both day and overnight visitors in the valley, and would lead to a general reduction in public exposure to rock fall events. Together, the overnight accommodation, visitor use management, and facilities actions would result in segmentwide, long-term, minor, beneficial impacts with respect to exposure of park visitors and facilities to geohazards.

**Soils.** Facility actions would remove or reduce lodging and tent cabins in areas currently subject to natural hazards (including removal of tent cabins from within 100 feet of the river), remove existing buildings, construct new concessioner housing areas, and construct new parking spaces. The removal of buildings and tent cabins would improve soils conditions and allow for soils to support plant growth resulting in local, long-term, minor, beneficial impacts. New concessioner housing and parking would directly affect soils through compaction and paving, and possibly increase pedestrian use of the area that would make soils more susceptible to erosion; thus, new facility development would result in local, long-term, minor, adverse impacts.

Transportation actions would construct, reroute, relocate, and formalize parking spaces. Construction of new parking spaces would directly affect soil resources in the area through installation, compaction, and paving. Parking spaces currently located in the 10-year floodplain would be removed and relocated, and soils beneath these areas would be restored to approximately their preconstruction condition. Relocated parking spaces would be equal or similar in size to current parking areas, would be designed and implemented to improve drainage and minimize runoff, and would not overlie sensitive or unique soils. Overall, parking spaces would be slightly increased in comparison to existing conditions and the use of informal overflow parking areas would be reduced. Therefore, these actions would have a local, long-term, negligible, adverse effect on soil resources.

Overnight accommodation actions would affect the availability, location, and style of overnight accommodations in Yosemite Valley, and would accommodate an overall increase in the number of overnight visitors. A substantial number of campsites and a handful of additional lodging units would be added to accommodate increased overnight visitation. The effects on soil resources of increasing camping and lodging areas would be long-term, negligible to minor, and adverse. These impacts would be offset to some degree by the benefits of facilities removal and restoration throughout the segment. Nonetheless, the net effect of these actions would be local, long-term, negligible, and adverse with respect to soil resources.

Visitor-use management actions would contribute to an overall reduction in total daily visitation. These actions would result in a decreased potential for crowding and could reduce the level and intensity of informal trail use in the valley. These actions would have a segmentwide, long-term, minor, beneficial impact with respect to soil resources.

**Curry Village & Campgrounds.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would permanently disturb approximately 8.5 acres of soil (Happyisles-Half Dome complex, Happyisles complex, and Happyisles sandy loam). As such, specific projects proposed under Alternative 5 for the Curry Village and Campgrounds areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, minor, beneficial impacts through removal of informal and paved parking areas, and infrastructure from the meadow and floodplain.

**Camp 6 & Yosemite Village.** The park would construct a pedestrian underpass and a traffic circle at the intersection of Northside and Yosemite Village Drives, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a three-way intersection connecting the parking lot to Sentinel Drive. These actions would permanently disturb approximately 27 acres of soil (Happyisles complex, Leidig fine sandy loam, and Elcapitan fine sandy loam). As such, specific projects proposed under Alternative 5 for the Camp 6 and Yosemite Village areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, minor, beneficial impacts through removal of informal and paved parking areas and infrastructure from the meadow and floodplain.

**Yosemite Lodge & Camp 4.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. These actions would permanently disturb approximately 18 acres of soil (Happyisles complex). As such, specific projects proposed under Alternative 5 for the Yosemite Lodge and Camp 4 areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, minor, beneficial impacts through removal of structures and infrastructure from the meadow and floodplain.

**Segment 2 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 2 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would also have long-term, local, minor, beneficial impacts on soil resources; and long-term, segmentwide, minor, beneficial geohazards impacts.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Oak protection areas would be designated in the Odgers' fuel storage area and adjacent parking areas. Parking and new building construction would be prohibited within the dripline. A 2.25 acre oak recruitment area would be established near the fuel storage area, within which nonnative fill would be removed and decompacted, invasive species would be removed, and native understory plants would be planted. This action would benefit soil resources by removing current stressors (e.g., parking and

foot traffic) and restoring soil function (through decompaction and replanting). This would have a long-term, local, minor, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** High-density housing units would be constructed at Rancheria Flatt in El Portal. Construction of all new structures would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can be reasonably anticipated in the region. These actions would result in a long-term, local, negligible, adverse impact with respect to geohazards in Segments 3 and 4.

**Soils.** The installation of new housing at Rancheria Flatt would directly disturb soil resources in small discrete areas through installation, compaction, and paving, and would also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the areas affected would be small and localized. Therefore, these actions would result in a long-term, local, minor, adverse impact on soil resources.

At Abbieville and El Portal Trailer Village, the park would remove or relocate existing housing and restore the floodplain. Sensitive soils along the floodplain would be restored to their preconstruction condition and would support native vegetation. These actions would have long-term, minor beneficial impact on soils at the local level.

**Segments 3 & 4 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 4 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, adverse impacts on soil resources; and long-term, local, negligible, adverse geohazard impacts.

**Segments 5, 6, 7 and 8: South Fork Merced River**

***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Project specific actions include relocation of stock use campsites from a culturally sensitive area to the Wawona Maintenance Yard. This action would shift impacts associated with stock camping to an already disturbed area, resulting in a local, long-term, minor, beneficial impact.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Actions to manage user capacity, land use and facilities would eliminate stables and day rides from the Wawona stables, and relocate the stock use campground. Soil stresses (e.g., compaction and

erosion) would be decreased due to the elimination of stable rides. These actions would have a local, long-term, minor, beneficial impact on soils in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. Removal of campground infrastructure (such as bear boxes, sign posts, etc.) would temporarily cause a minor increase in soil disturbance; however, in the long-term these areas would recover from past visitor- and recreational-related stresses (such as continuing soil compaction at campsites and access roads). The areas in the floodplain would slowly recover to natural conditions under continuing natural processes. The overall long-term impact would be local, minor, and beneficial.

**Segments 5-8 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 5-8 would result in local, long-term, minor beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, beneficial impacts on soil resources.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

In segmentwide and parkwide contexts, Alternative 5 would result in long-term, minor, beneficial impacts with respect to exposure of facilities and visitors to geohazards. Adherence to applicable building codes (all segments) and implementation of the 2012 Yosemite Valley Geologic Hazard Guidelines (Segment 2 only) would ensure that new or relocated structures are designed to withstand an earthquake and are located outside of the rock-fall hazard zone. On a local level, such as the Curry Village area, Alternative 5 would result in long-term, minor, beneficial impacts with respect to exposure of facilities and visitors to geohazards.

Alternative 5 would generally maintain the current level of total park visitation but would increase the level of overnight accommodation. However, Alternative 5 would move the location of overnight accommodations away from sensitive meadow and riparian zones and concentrate them in wooded and previously disturbed locations, locally allowing sensitive soils to recover. While signage, fencing, and formal access points implemented under Alternatives 2–6 would direct visitors to formal routes and trails and away from sensitive soils and habitats, visitor use impacts on soils in sensitive areas could nevertheless continue to occur during periods of peak visitation. For these reasons, actions under Alternative 5 would result in short-term, minor, adverse impacts (e.g., due to construction/grading), and long-term, minor, beneficial impacts with respect to soil resources in both segmentwide and parkwide contexts.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Past and present projects and management plans, which include the existence and maintenance of facilities within rock fall hazard areas, when considered with Alternative 5, would still expose park visitors and employees to injury and damage from earthquakes and rock falls. Continued stabilization



and rehabilitation work would reduce impacts in targeted areas, which would be a long-term, beneficial impact. Actions under Alternative 5 would adhere to applicable building codes (in all segments) and the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2 only). At a parkwide level, Alternative 5, in combination with past, present, and reasonably foreseeable future projects, would result in a negligible, adverse, cumulative effect with respect to exposure of park visitors and facilities to geohazards.

Cumulatively, a combination of adverse and beneficial impacts on soil resources would occur under Alternative 5. The net effect of these actions are difficult to anticipate, but would likely result in beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) that would outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternatives 5 would result in a parkwide, minor, beneficial, cumulative impact.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Geohazards.** Alternative 6 would accommodate a slight increase in park visitation compared with existing conditions (21,800 visitors compared with 20,900 visitors). The exposure of park visitors to geohazards would continue to be similar to existing conditions; therefore, visitor use actions could result in parkwide, long-term, minor, adverse impacts with respect to visitor exposure to geohazards.

**Soils.** With visitation slightly higher than under present conditions, ongoing visitor use impacts on natural resources, such as creation of informal trails, trampling of vegetation, and increased bank erosion, would continue. However, restoration actions common to Alternatives 2–6 would ecologically restore many of the areas in the park, particularly in Segments 1, 2, and 4, by removing and ecologically restoring informal trails, restoring sensitive meadow and riparian habitats, and implementing fencing and directing visitor access to formal recreational areas and/or resilient areas. While the specific effects of the management actions on soil resources would be difficult to quantify or distinguish from the beneficial effects of restoration actions common to Alternatives 2–6, they would have a local, long-term, minor, beneficial impact on soil resources.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Visitation within Segment 1 would not be expected to change appreciably under Alternative 6; wilderness access quotas would remain as under Alternative 1 (No Action) (150) and modifications to

overnight accommodations would be nominal. The resulting impacts on soil resources would be similar to those of Alternative 1; local, long-term, minor, and adverse.

Pack stock used for administrative purposes would graze on meadow vegetation near the Merced Lake Ranger Station in accordance with established grazing capacities. This would reduce overgrazing of the meadow, increase natural vegetative cover, and reduce potential erosion resulting from exposed soil. The resulting impact on soil resources would be local, long-term, negligible, and beneficial.

**Merced Lake High Sierra Camp.** Actions in the Merced Lake High Sierra Camp area proposed under Alternative 6 involve retention of the Merced Lake High Sierra Camp and replacing the flush toilets with composting toilets. These actions would not affect existing levels of public risk or exposure to geohazards, but would have local, long-term, negligible, beneficial impacts on soil resources by reducing stresses on soils from the presence of infrastructure.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would result in local, long-term, minor, beneficial impacts on soil resources.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Soils.** Under Alternative 6, all campsites and associated infrastructure within 100 feet of the ordinary high-water mark of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines and Upper Pines campgrounds, Lower Pines and Yellow Pine campgrounds, and tent-style lodging units at Housekeeping Camp. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Methods for restoration would include recontouring, ditch removal, and decompaction. Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil as decompaction occurs, using an excavator or dozer with winged rippers. These actions would have a short-term, minor, adverse impact on soil resources due to the trampling of vegetation and compaction of soil by heavy equipment. After construction, restored areas would result in established vegetation that would reduce soil erosion and increase soil character and function. The resulting impacts would be long-term, minor to moderate, and beneficial.

Under Alternative 6, river access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable Merced River access points throughout the Segment 2, and areas of compacted soils would be decompacted and restored. This

would improve bank stability at river access points, thus reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on soil resources.

**Biological Resource Actions.** Specific projects include removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; removing asphalt and fill material, restoring topography of 19.7 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing valley campsites and infrastructure from within 100 feet of the river and restoring 6.5 acres of riparian habitat; and removing informal trails, installing viewing platforms and boardwalks, and selectively remove conifers to improve views at El Capitan Meadow. The benefits of these actions include removal of past human alterations, soil decompaction, and restoration of natural topographic contours and soil function. As a result, these actions would have local, long-term, minor to moderate, beneficial impacts with respect to soil resources.

**Hydrologic/Geologic Resource Actions:** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 6 include relocating unimproved Camp 6 parking out of the 10-year floodplain. These actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Geohazards.** No new campsites or lodging would be located in the rock-fall hazard zone. Structures would be reduced since facilities would be removed from the valley, tent cabins would be removed from floodplain and rock-fall hazard zone. These actions would avoid increased exposure of park visitors and facilities to rock fall and would reduce the number of structures subject to earthquake damage. Further, visitor-use management actions would result in a substantial reduction in both day and overnight visitors in the valley, and would lead to a general reduction in public exposure to rock fall events. Together, the overnight accommodation, visitor use management, and facilities actions would result in segmentwide, long-term, negligible, beneficial impacts with respect to exposure of park visitors and facilities to geohazards.

**Soils.** Facility actions would remove or reduce lodging and tent cabins in areas currently subject to natural hazards (including removal of tent cabins from within 100 feet of the river), remove existing buildings, construct new concessioner housing areas, and construct new parking spaces. The removal of buildings and tent cabins would improve soils conditions and allow for soils to support plant growth resulting in local, long-term, minor, beneficial impacts. New concessioner housing and parking would directly affect soils through compaction and paving, and possibly increase pedestrian use of the area that would make soils more susceptible to erosion; thus, new facility development would result in local, long-term, minor, adverse impacts.

Transportation actions would construct, reroute, relocate, and formalize parking spaces. Construction of new parking spaces would directly affect soil resources in the area through installation, compaction, and paving. Parking spaces currently located in the 10-year floodplain would be removed and relocated, and soils beneath these areas would be restored to approximately their preconstruction condition. Relocated parking spaces would be equal or similar in size to current parking areas, would be designed and

implemented to improve drainage and minimize runoff, and would not overlie sensitive or unique soils. Overall, parking spaces would be increased in comparison to existing conditions and the use of informal overflow parking areas would be reduced. Therefore, these actions would have a local, long-term, minor, adverse effect on soil resources.

Overnight accommodation actions would affect the availability, location, and style of overnight accommodations in Yosemite Valley, and would accommodate an overall increase in the number of overnight visitors. A substantial number of campsites and lodging units would be added to accommodate increased overnight visitation. Many of these actions would occur within previously disturbed areas, such as the area of former Yosemite Lodge units removed after being damaged by the 1997 flood. The effects on soil resources of increasing camping and lodging areas would be long-term, minor, and adverse. These impacts would be offset to some degree by the benefits of facilities removal and restoration throughout the segment. Nonetheless, the net effect of these actions would be local, long-term, minor, and adverse with respect to soil resources.

Visitor-use management actions would contribute to an overall increase in total daily visitation. These actions would result in an increase potential for crowding and could also increase the level and intensity of informal trailing in the valley. These actions would have a segmentwide, long-term, negligible to minor, adverse impact with respect to soil resources.

**Curry Village & Campgrounds.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would permanently disturb approximately 8.5 acres of soil (Happyisles-Half Dome complex, Happyisles complex, and Happyisles sandy loam). As such, actions under Alternative 6 in the Curry Village and Campgrounds areas would result in short-term, minor, adverse impacts on soil resources, but long-term, minor, beneficial impacts through removal of informal and paved parking areas and infrastructure from the meadow and floodplain.

**Camp 6 & Yosemite Village.** The park would construct a pedestrian underpass and two roundabouts, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a three-way intersection connecting the parking lot to Sentinel Drive. These actions would permanently disturb approximately 27 acres of soil (Happyisles complex, Leidig fine sandy loam, and Elcapitan fine sandy loam). Essential functions of the Concessioner General Office would be infilled into a re-modeled Concessioner Maintenance and Warehouse Building with a 4,000-square-foot addition. However, there would be no new permanent disturbance as the expansion would occur within a previously disturbed area. As such, specific projects proposed under Alternative 6 in the Camp 6 and Yosemite Village areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, minor, beneficial impacts through removal of informal and paved parking areas and infrastructure from the meadow and floodplain.

**Yosemite Lodge & Camp 4.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and

15 tour busses. These actions would permanently disturb approximately 18 acres of soil (Happyisles complex). As such, actions under Alternative 6 in the Yosemite Lodge and Camp 4 areas would result in local, short-term, minor, adverse impacts on soil resources, but local, long-term, minor, beneficial impacts through removal of structures and infrastructure from the meadow and floodplain.

**Segment 2 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 2 would have long-term, local and segmentwide, minor to moderate, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would also have long-term, local, negligible, beneficial impacts on soil resources; and long-term, segmentwide, negligible, adverse geohazards impacts.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Value***

**Soils.** Oak protection areas would be designated in the Odgers' fuel storage area and adjacent parking areas. Parking and new building construction would be prohibited within the dripline. A one-acre oak recruitment area would be established near the fuel storage area, within which nonnative fill would be removed and decompacted, invasive species would be removed, and native understory plants would be planted. This action would benefit soil resources by removing current stressors (e.g., parking and foot traffic) and restoring soil function (through decompaction and replanting). This would have a long-term, local, minor, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.

#### ***Impacts of Actions to Protect and Enhance River Values***

**Geohazards.** Facility, overnight accommodation, and transportation actions would install high-density housing units and campsites in Abbieville and Trailer Village, and Rancheria Flatt in El Portal. Construction of all new structures would be performed in a manner that is in compliance with the most recent version of the International Building Code, such that facilities would be designed to withstand the maximum peak ground accelerations that can be reasonably anticipated in the region. These actions would result in a long-term, local, negligible, adverse impact with respect to geohazards in Segments 3 and 4.

**Soils.** Overnight accommodation, transportation, and facility actions would install new campsites and high-density housing units in the Abbieville, El Portal Trailer Village, and Rancheria Flatt areas. The installation of these facilities would directly disturb soil resources in small discrete areas through installation, compaction, and paving, and would also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. However, the areas affected would be small and localized and, with regard to the former, the proposed facilities would be redeveloped within the existing footprint of the Abbieville and El Portal Trailer Village areas. Further, because new campsites would be equal or similar in size to the removed Yellow Pine campsites, soils disturbed from new campsites would be offset within the segment by the ecological restoration of the removed

campsites. Therefore, these actions would result in a long-term, local, minor, adverse impact on soil resources.

**Segments 3 & 4 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segment 4 would have long-term, local and segmentwide, minor, beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, adverse impacts on soil resources.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Project specific actions include relocation of stock use campsites from a culturally sensitive area to Wawona Stables. This action would shift impacts associated with stock camping to an already disturbed area, resulting in a local, long-term, minor, beneficial impact.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Soils.** Actions to manage user capacity, land use and facilities would eliminate stables and day rides from the Wawona stables, and relocate the stock use campground. Soil stresses (e.g., compaction and erosion) would be decreased due to the elimination of stable rides. These actions would have a local, long-term, minor, beneficial impact on soils in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. Removal of campground infrastructure (such as bear boxes, sign posts, etc.) would temporarily cause a minor increase in soil disturbance; however, in the long-term these areas would recover from past visitor- and recreational-related stresses (such as continuing soil compaction at campsites and access roads). The areas in the floodplain would slowly recover to natural conditions under continuing natural processes. The overall long-term impact would be local, minor, and beneficial.

**Segments 5-8 Impact Summary:** With implementation of mitigation measures MM-GEO-1 and -2, and MM-HYD-1, as applicable (see Appendix C), actions to protect and enhance river values within Segments 5-8 would result in local, long-term, minor beneficial impacts on soil resources. With mitigation, as applicable, actions to manage user capacities, land use, and facilities would have long-term, local, minor, beneficial impacts on soil resources, and long-term, local, negligible, adverse geohazards impacts.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

In segmentwide and parkwide contexts, Alternative 6 would result in and long-term, negligible, beneficial impacts with respect to exposure of facilities and visitors to geohazards. Adherence to applicable building codes (all segments) and implementation of the 2012 Yosemite Valley Geologic

Hazard Guidelines (Segment 2 only) would ensure that new or relocated structures are designed to withstand an earthquake and are located outside of the rock-fall hazard zone. On a local level, such as the Curry Village area, Alternative 6 would result in long-term, moderate beneficial impacts with respect to exposure of facilities and visitors to geohazards.

Alternative 6 would increase the current level of total park visitation and would substantially increase the level of overnight accommodations. However, overnight accommodations under Alternative 6 would generally be concentrated in wooded, developed, and/or previously disturbed locations, and campsites within the ordinary high-water mark of the Merced River would be relocated. Some areas currently recovering from past soil disturbances (e.g., Lower River Campground) would be redeveloped, thereby locally halting recovery of soils. However, on both segmentwide and parkwide levels, restoration actions common to Alternatives 2–6 would remove and ecologically restore informal trails, restore sensitive meadow and riparian habitats, and direct visitor access to formal recreational areas and/or resilient areas using fencing and signage. These measures would aid in properly managing increasing levels of visitor use and avoiding adverse effects on sensitive soil resources.

Despite restoration actions under Alternatives 2–6, adverse impacts on soils from informal trailing, soil compaction, and vegetation trampling may continue in localized areas under increasing levels of visitation and with increased overnight accommodations. Fencing and signage may not be able to effectively reverse or halt continuing adverse impacts on soils, especially during periods of peak visitation when conditions may become overcrowded. For these reasons, actions under Alternative 6 would result in short-term, minor, adverse impacts (e.g., due to construction/grading), and long-term, minor, adverse impacts with respect to soil resources in segmentwide and parkwide contexts.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Past and present projects and management plans, which include the existence and maintenance of facilities within rock fall hazard areas, when considered with Alternative 6, would still expose park visitors and employees to injury and damage from earthquakes and rock falls. Continued stabilization and rehabilitation work would reduce impacts in targeted areas, which would be a long-term, beneficial impact. Actions under Alternative 6 would adhere to applicable building codes (in all segments) and the 2012 Yosemite Valley Geologic Hazard Guidelines (in Segment 2 only). At a parkwide level, Alternative 6, in combination with past, present, and reasonably foreseeable future projects, would result in a negligible, adverse, cumulative effect with respect to exposure of park visitors and facilities to geohazards.

Cumulatively, a combination of adverse and beneficial impacts on soil resources would occur under Alternative 6. The net effect of these actions are difficult to anticipate, but would likely result in beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) that would outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternatives 6 would result in a parkwide, negligible, beneficial, cumulative impact.



## Hydrology, Floodplains, and Water Quality

### *Affected Environment*

#### Regulatory Framework

The Wild and Scenic Rivers Act directs managing agencies to preserve free-flowing conditions and water quality of designated rivers. “Free flowing,” as applied, means existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification. Water quality is to be maintained or improved to levels that meet federal criteria or federally approved state standards for aesthetics, fish, and wildlife propagation.

The Clean Water Act of 1972 (CWA), as amended (33 USC, section 1251 et seq.), establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters (33 CFR 323.3). Under the CWA, the U.S. Environmental Protection Agency (EPA) sets water quality standards for all contaminants in surface waters and implements pollution control programs, such as the National Pollutant Discharge Elimination System permit program, which requires a federal permit for any proposed point source of water pollution (EPA 1972). CWA section 404 regulates the placement of dredged or fill materials into wetlands and other jurisdictional waters of the U.S.; section 401 requires federal agencies to obtain certification from the state or federally recognized Indian tribe (on tribal lands) before issuing permits that would increase pollutant loads to a body of water. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation’s waters. The surface water features in Yosemite National Park support the unique value of the park. Director’s Order # 83 (“Public Health”) (NPS 2004c), and the National Park Service’s (NPS’s) *Management Policies 2006*, instructs the NPS to work with appropriate governmental bodies to obtain the highest possible standards available under the CWA. Further these policies instruct park management to take all necessary actions to maintain or restore the quality of surface water and groundwater within national parks, consistent with the CWA and all other applicable federal, state, and local laws and regulations. With respect specifically to drinking water quality, Reference Manual 83F, “Backcountry Operations,” instructs park managers to ensure that minimum standards for public health are maintained in the backcountry where frontcountry standards are not achievable (NPS 2004; NPS 2008D).

In addition to the CWA, water quality is protected by provisions of the Safe Drinking Water Act; the Resource Conservation and Recovery Act (RCRA); and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). For example, under the Safe Drinking Water Act, the Underground Injection Control Program prohibits the subsurface emplacement of fluids that could contaminate current or future underground sources of drinking water, and under the RCRA, underground storage tanks are regulated to prevent leaking and possible contamination of the environment, including surface and groundwater resources.

The Porter-Cologne Water Quality Control Act (California Water Code, section 13020) and the federal CWA provide the jurisdictional basis for the Regional Water Quality Control Boards and the State Water Resources Control Board. These agencies are responsible for enforcement of water quality

laws and coordination of water quality control activities. The regional board for the Yosemite area is the Central Valley.

As required by Executive Order 11988 (“Floodplain Management”) (NPS 2006), NPS Director’s Order 77-2 (“Floodplain Management”) (NPS 2003A), and NPS Procedural Manual 77-2 (“Floodplain Management”) (NPS 2004), it is NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding. Specifically, the NPS is directed to (1) protect and preserve the natural resources and functions of floodplains; (2) avoid the long- and short-term environmental effects associated with the occupancy and modification of floodplains; (3) avoid direct and indirect support of floodplain development and actions that could adversely affect the natural resources and functions of floodplains or increase flood risks; and (4) restore, when practicable, natural floodplain values previously affected by land use activities within floodplains. Natural floodplain values are attributes of floodplain that contribute to ecosystem quality, including, but not limited to, soils, vegetation, wildlife habitat, dissipation of flood energy, sedimentation processes, and groundwater (including riparian groundwater) recharge. Periodic disturbance of natural floodplain soils and geomorphic and vegetation attributes by floods also contribute to ecosystem quality.

When it is not practicable to locate or relocate development or inappropriate human activities to a site outside and not affecting the floodplain, the NPS is directed to (1) take all reasonable actions to minimize the impact on the natural resources of floodplains; (2) use nonstructural measures, as much as practicable, to reduce hazards to human life and property; and (3) ensure that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR part 60).

Flood hazard areas regulated by the NPS include the 100-year floodplain (or the Base Floodplain), the 500-year floodplain, and the Extreme Floodplain. The 100-year floodplain is the area that would be inundated by the 100-year flood, or the peak flow that has a 1% chance of being equaled or exceeded in any given year. Likewise the 500-year floodplain is the area that would be inundated by a 500-year, or 0.2% chance, flood. The extreme floodplain is the area inundated by the extreme flood, the flood considered to be the largest in magnitude possible at a site. NPS Director’s Order 77-2 (“Floodplain Management”) also states that if a proposed action is found to be in the applicable regulatory floodplain, the agency shall prepare a floodplain assessment, known as a Statement of Findings (see Appendix D). A Statement of Findings will be prepared for the *Merced River Plan/EIS* in accordance with NPS Director’s Order 77-2 (“Floodplain Management”), and the associated Procedural Manual 77-2.

The Federal Refuse Act prohibits the discharge or deposition of any refuse matter of any kind into waters of the United States. This act supports the monitoring of stormwater runoff from developed surfaces discharged, directly or indirectly, into the Merced River. Refuse includes garbage, trash, oil, and other liquid pollutants.

### ***Regional Hydrologic Setting***

The Merced River originates along the crest of the Sierra Nevada at an elevation of about 13,000 feet and flows west for 145 miles to its confluence with the San Joaquin River in the Central Valley. From its headwaters, the main stem flows through Little Yosemite Valley, Yosemite Valley, and the Merced

River gorge before leaving Yosemite National Park. The South Fork Merced River originates near Triple Divide Peak at an elevation of over 10,500 feet. It flows west through Wawona, then joins the Merced River near Indian Flat. Outside of the park, the Merced River continues through the Merced River canyon before entering Lake McClure. From the outlet of Lake McClure, the Merced River continues westward toward the confluence with the San Joaquin River near Hills Ferry.

The Merced River basin (the northern or main stem of the river), includes Segments 1, 2, 3, and 4, and the South Fork Merced River basin includes Segments 5, 6, 7, and 8. Within the park, the Merced River drains about 256,000 acres (400 square miles), and the South Fork Merced River drains about 70,000 acres (110 square miles). In total, they drain about one-third of Yosemite National Park.

The Sierra Nevada region is characterized by a Mediterranean-type climate with cool, wet winters and warm, dry summers. About 85% of the precipitation occurs between November and April. December, January, and February have the highest average precipitation, with a monthly average of 6 inches in Yosemite Valley at 4,000 feet. Average annual precipitation in Yosemite Valley is 37.4 inches (WRCC, 2012). Annual precipitation decreases to 25 inches in El Portal at 2,000 feet and increases to 70 inches in the red fir forest at 6,000 to 8,000 feet (Eagan 1998). Most precipitation in Yosemite Valley falls as rain. At elevations above 5,000 feet, 80% of the annual precipitation falls as snow. Seasonal streamflows are primarily driven through melting of the snowpack that accumulates between October and April. Typically, the highest runoff occurs between late April to June when snowmelt reaches its peak (Mast and Clow 2000).

Over the past 50 to 60 years, rising temperatures in the Sierra Nevada have resulted in a greater proportion of precipitation falling as rain (Knowles et al. 2006) and an earlier initiation of snowmelt (Mote et al. 2005; Stewart et al. 2005). These observed changes have a number of implications for the hydrology of the Merced River. Studies suggest that as a greater proportion of precipitation falls as rain as opposed to snow, flood risks during the winter months were more pronounced (Hamlet et al. 2007). As snowmelt begins earlier in the season, less water could be available for habitat or water supply during the summer months (Hamlet et al. 2007). According to commonly accepted climate change scenarios, temperatures in the Sierra Nevada region are expected to rise significantly during the 21st century (Cayan et al. 2007), continuing these trends.

## **Merced River Hydrology**

### ***Segment 1: Merced River Above Nevada Fall***

The Merced River above Nevada Fall descends from its headwaters through a glacially carved canyon, dropping from about 13,000 feet to 6,000 feet over a distance of 12 miles. Topography is characterized by jagged peaks, precipitous cliffs, steep canyons, broad interstream areas of glacially smoothed granite; small lakes and meadows; and thin, granitic soils. Four tributaries to the Merced River (the Lyell Fork, Triple Peak Fork, Merced Peak Fork, and Red Peak Fork) meet in a low-gradient, glacially carved valley at approximately 7,500 feet. Below Bunnell Cascade, the Merced River enters Little Yosemite Valley, another low-gradient, glacially carved valley. Here, the river meanders across its floodplain, creating oxbow lakes and meander cutoffs. Average annual precipitation at treeline (about 10,500 feet) is about 55 inches with as much as 95% occurring in the form of snow (Mast and Clow 2000).

The average annual discharge of the upper Merced River (measured at Happy Isles, the uppermost gage on the river) is approximately 355 cubic feet per second, and the average annual total discharge is approximately 257,100 acre-feet (USGS 2010). Average monthly discharge varies from 38.8 cubic feet per second in October to 1,250 cubic feet per second in May (Mast and Clow 2000).

### *Segment 2: Yosemite Valley*

In Yosemite Valley, the Merced River is influenced by alluvial processes, producing a dynamic river that changes course periodically through erosion and deposition. In most locations, the river flows through a shallow channel approximately 100 to 300 feet wide. In the middle of Yosemite Valley, the Merced River can convey between the 2- and 5-year floods before beginning to inundate its floodplain (Jackson, Smillie, and Martin 1997).

The main tributaries to the Merced River in Yosemite Valley are Tenaya Creek, Illilouette Creek, Yosemite Creek, and Bridalveil Creek. Historic discharge in the river, measured at the Pohono Bridge gauging station, has ranged from a high of 24,600 cubic feet per second on January 3, 1997 to a low 5.4 cubic feet per second on October 26, 1997. The mean daily discharge rate is 627 cubic feet per second, with an average annual total discharge of 454,200 acre-feet (USGS 2010).

Between Nevada Fall and the Happy Isles Bridge the river is heavily controlled by bedrock and massive talus boulders. From Happy Isles Bridge to Clark's Bridge, the channel has a gradient of 1% and is confined on the right bank by moraines for much of its length. Below Clark's Bridge, the river gradient drops to 0.16% (Madej et al. 1991) and becomes a meandering alluvial system.

In 1879, large boulders were blasted to deepen and widen the river gap through the El Capitan moraine, which lowered the base level of the Merced River by 4 to 5 feet (Milestone 1978). As a result, the extent and frequency of flooding in the upstream meadows was reduced within approximately three to four miles of the moraine (approximately up to Superintendent's Bridge), leading to drier conditions and the loss of historic wetlands.

Evidence (such as historical maps and floodplain topography) suggests that the Merced River in this segment has always had a high rate of lateral erosion, which may have increased in response to human activities such as trampling along the banks, which removes vegetation and roots that bind soil. Between 1879 and the early 1970s, the NPS stabilized the bank to prevent channel migration near campsites and infrastructure. By 1987, 25% of the Merced River bank was lined with riprap between Clark's Bridge and Sentinel Bridge, the area with the greatest infrastructure and human presence. In west Yosemite Valley (downstream of Swinging Bridge) only 2% of the channel is riprapped. Riprap, where it is successful in preventing channel erosion, inhibits the free-flowing condition of the river by preventing natural stream processes, such as lateral migration and point bar formation (Florshiem et al. 2008; Schmetterling et al. 2001). Between 1919 and 1986, visitor trampling along the banks and use of the banks as access points to the river between Clark's Bridge and Sentinel Bridge damaged riparian vegetation. This condition, along with bridge openings that are too narrow, and to a lesser extent, removal of large wood and gravel mining, contributed to bank widening. Overall, between 1919 and 1986, these factors contributed to the widening of banks by an average of 27% along this reach and by over 100% in some locations (Madej et al. 1991). At the time of designation, 39% of the river between

Clark's Bridge and Sentinel Bridge was actively eroding, even though 25% of the eroding channel had been lined with riprap in an effort to control bank erosion (Madej et al. 1991). Downstream in the west Valley, 25% of the banks were actively eroding and only 2% were lined with riprap, allowing more natural channel dynamics. Madej et al. (1991) found a strong association between levels of human use around campsites and river access points and the loss of riparian vegetation cover and accelerated bank erosion.

Erosion has recently been observed on the outside of meander bends, with the most significant location being near Sentinel Beach Picnic Area. Channel widening is also occurring through erosion of both banks between Swinging Bridge and El Capitan Picnic Area, and on the outer bends between El Capitan Picnic Area and El Capitan Meadow (Cardno Entrix 2011).

Recently, the riverbank condition has been restored in Segment 2 at Housekeeping Camp, North Pines Campground, Sentinel Bridge, the former Lower River Campground, and the original El Capitan Picnic Area. The El Capitan Picnic Area was also relocated farther from the river as part of these restoration projects. Restoration techniques have included soil decompaction, revegetation, bioengineering stabilization, riprap removal, and installation of fencing to protect restored areas. Through these restoration projects, approximately 1,700 cubic yards of riprap have been removed from the banks of the Merced River, 2,600 feet of biotechnical bank stabilization have been installed, and 15,000 feet of fencing have been installed (numbers estimated from Cardno Entrix 2011). The installation of riprap largely ceased in the early 1970s, and no new hardened bank stabilization has been added since the time of designation of the Merced as a Wild and Scenic River. Since that time, the river has undermined riprap in some locations, and bank erosion is occurring behind the lines of riprap.

### ***Segments 3 and 4: Merced Gorge and El Portal***

In contrast to the alluvial nature of the Merced River within Yosemite Valley, the Merced River gorge is characterized by steeper, high-energy cascades. As the river exits Yosemite Valley, it flows through the narrow, steep-sided Merced River gorge with an average gradient of 3% (FEMA 2009). The riverbed and banks are largely composed of boulders and cobbles, ranging in size from a few inches to several yards in diameter. There are no stream gages on the Merced River within Segments 3 and 4, but hydrology is similar to the Pohono Bridge gaging station (Segment 2). Tributaries within the gorge are small; Cascade Creek flows into the Merced River as the river enters the steepest part of the gorge.

In late 2003 and early 2004, the Cascades Diversion Dam was removed from the gorge segment of the river. The Cascades Diversion Dam was located near the far western end of Yosemite Valley where the river transitions from the Valley floodplain into the steep river gorge. This dam was originally constructed to divert water from the Merced River into a hydroelectric power plant that is no longer in use. The removal of the dam allowed the accumulation of sediments retained behind the dam to redistribute downriver during periods of higher river flows.

El Portal is an area located downstream of the Merced River gorge where gradients flatten, and water velocity decreases after being routed through the gorge. El Portal includes various bar type deposits, with large boulder bars that include boulders up to several feet across and weighing many tons located

on the eastern end. Cobble sizes reduce across the area from east to west. Thus, river morphology in this area transitions from steep boulder cascades to step pools to a pool-riffle system. River meanders begin to occur in this area.

The Merced River within El Portal is confined by roads and revetment, which in some areas encroaches into the river's historical bed. A small deflection bar protects the Trailer Court, along with a berm along El Portal Road that cut off the river's floodplain and a historic meander (Odgers Pond), remnant rock diversions, and the remnants of the Greenmeyer sand pit, which was used until 1997.

#### *Segments 5, 6, 7, and 8: South Fork Merced River*

The watershed area of the South Fork Merced River at Wawona is approximately 63,000 acres (98 square miles) and expands to 154,000 acres (76,000 acres within the park boundary) by the South Fork Merced River's confluence with the main stem outside of the park boundary. The headwaters of the South Fork Merced River originate near Triple Divide Peak at an elevation of approximately 10,500 feet. The South Fork Merced River flows westward over an area underlain by granitic bedrock to Wawona and then flows northwest over an area underlain by meta-sedimentary rocks at a 3,500-foot elevation (USGS 1996). Upstream from Wawona, tributaries enter the steep-walled canyon (glacial gorge) of the South Fork Merced River from the north and south. In the Wawona area, the river meanders through a large floodplain meadow with substantial gravel bars within the channel.

In Wawona (elevation 4,000 feet), precipitation occurs either as rain or snow, which melts quickly. At higher altitudes of the South Fork Merced River basin, precipitation usually occurs as snow, which melts more slowly and sustains the flow of the river during the spring and early summer. Average annual precipitation at the South Entrance Station is approximately 40 inches. Precipitation averages 50–60 inches per year in the upstream reaches of the South Fork Merced River basin.

The total length of the South Fork Merced River is 43 miles from its headwaters to its confluence with the main stem of the Merced River, several miles downstream from the western park boundary (USGS 1992). Streamflow records exist for the South Fork Merced River at the Merced River confluence from 1911–1921 and at Wawona, upstream of the Big Creek confluence, from 1958–1968. From these records, between 1911 and 1921, the average annual discharge was 356 cubic feet per second at the Merced River confluence. Between 1958 and 1968, upstream of the Big Creek confluence, the average annual flow was 174 cubic feet per second.

Within the Wawona area, a small impoundment created to pool water at the intake of Wawona's surface water supply is located near the end of Forest Drive. This area is designed to maintain a sufficient water level for the intake. Over time, the pool has filled with small cobbles, sands, and other sediments but does not represent a major source of sediment or act as a significant barrier to river flow and dynamics.

## **Infrastructure in the River Corridor**

### ***Segment 1: Merced River Above Nevada Fall***

Human infrastructure along the Merced River corridor above Nevada Fall includes hiking trails, bridges, a diversion wall, small utility systems, the Lower Yosemite Valley Ranger Station, three wilderness designated camping areas, and the Merced Lake High Sierra Camp facilities. Bridges in this upper watershed consist of footbridges made of wood and stone that can obstruct the free flow of the river during high flows. Before the 1900s, a diversion dam was constructed at Nevada Fall to divert flow away from what is now the Mist Trail to protect the trail that once led to the former La Casa Nevada Hotel just below Nevada Fall.

### ***Segment 2: Yosemite Valley***

The Yosemite Valley segment of the river corridor contains numerous picnic areas, hiking trails, campgrounds, lodging facilities, roadways, parking areas, bridges, and utility systems. A more expansive discussion of infrastructure is presented in the “Park Operations and Facilities” section, below.

Three large campgrounds exist within the Valley. These include Upper Pines Campground, North Pines Campground, and Lower Pines Campground. Tent-style lodging facilities are available in Curry Village and at Housekeeping Camp. Some of the campsites and tent-style lodging units are located in proximity to the Merced River and are subject to periodic flooding. In addition, the location of some of these facilities has resulted in soil compaction, vegetation denudation, and increased erosion along some shoreline areas. Past and present structures constructed within the floodplain can impede hydrologic flows and/or are subject to recurring flooding. Eleven bridges cross the Merced River between Happy Isles and the Pohono Bridge. Many of these bridges influence the width, location, and velocity of the Merced River (Madej et al. 1991). All bridges constrict flow to some degree, but hydraulic constrictions are especially pronounced at the four arch bridges built in the 1920s (Clark’s Bridge, Ahwahnee Bridge, Sugar Pine Bridge, and Stoneman Bridge) as well as at Housekeeping Bridge. Milestone (1978) found the average constriction to be almost 50 feet, or 40%, of the natural channel width. Flow constriction by bridges creates eddies upstream and downstream causing bank erosion, and enhances channel bed scour that results in bar formation downstream forcing lateral migration of the river. Bridges have also created hard points that anchor channel migration, preventing channel evolution. The effects of some of these bridges are exacerbated by the elevated road causeways leading to them, which intercept and concentrate floodplain flows at high water.

One bridge (the Happy Isles Gage Bridge) was removed from the channel following the 1997 flood, and Sentinel Bridge was reconstructed immediately upstream of its original location. **Table 9-1** describes the level of concern associated with each bridge, as identified in an earlier study of Segment 2 (Madej et al. 1991).

### ***Segments 3 and 4: Merced Gorge and El Portal***

The Merced River through the gorge and El Portal is locally confined by riprap, Highway 140/El Portal Road, and Foresta Road. The Merced River in El Portal is also confined by the deflection bar near the trailer village and the levee that protects the infrastructure near the market and gas station. There are



**TABLE 9-1: BRIDGES CAUSING HYDRAULIC CONSTRICTIONS IN YOSEMITE VALLEY**

Bridge	Level of Concern <sup>a</sup>
Sugar Pine Bridge	Severe
Stoneman Bridge	Serious
Housekeeping Footbridge	Moderate
Sentinel Bridge <sup>b</sup>	Moderate
Ahwahnee Bridge <sup>c</sup>	Moderately low
Clark's Bridge	Low
<sup>a</sup> The level of concern is based on the expected damage that would occur to park resources if corrective work is not undertaken. Potential damage ranges from severe, in the case of Sugar Pine Bridge (where major changes in channel patterns could easily be triggered by continued enlargement of the cutoff channel), to low, in the case of Clark's Bridge (where the channel is steep and bridge effects are confined to local scouring downstream of the right abutment). <sup>b</sup> Based on 1989 field work. Sentinel Bridge was later reconstructed. <sup>c</sup> Ahwahnee Bridge was not evaluated without Sugar Pine Bridge in place. SOURCE: Madej et al. 1991	

numerous vehicle turnouts and a picnic area along the gorge segment of the Merced River, but no bridge crossings. There are two bridge crossings in the El Portal segment: the Highway 140 Bridge, near Middle Road, and the Foresta Bridge. Numerous formal and informal parking areas exist along Foresta Road, near the NPS administrative building. On the southeast side of the river, opposite Rancheria Flat, lies the former Greenemeyer sand pit. Fill material associated with the former mining operation precludes flooding and regeneration of riparian plant communities in this area.

#### ***Segments 5, 6, 7, and 8: South Fork Merced River***

Infrastructure within Segments 5, 6, 7, and 8 includes numerous roads and hiking trails, three bridge crossings, two picnic areas, and two campgrounds, among other things. Bridge crossings include the Wawona Swinging Bridge (a footbridge), Wawona Covered Bridge, and the Wawona Bridge. Camping facilities include the Wawona campgrounds. Picnic areas are near the Wawona Store and near the Wawona Campground. Other structures in Wawona include the gas station and various small barns and other small structures. In addition, a small impoundment created to pool water at the intake of Wawona's surface water supply is near the end of Forest Drive. This area is designed to maintain a sufficient water level for the intake.

#### **Water Supply and Use**

Water supply within the study area comes primarily from groundwater aquifers, though the Merced Lake High Sierra Camp and Wawona rely on some diversions from the Merced River (surface water). There are four general types of groundwater in Yosemite National Park: large alluvial valleys such as Yosemite Valley; small deposits of alluvium, colluvium, and glacial till; porous geologic formations; and fractured rocks. The shallow aquifers of alluvial deposits tend to be highly responsive to groundwater recharge and withdrawals. The deep aquifers within the fractured rock are mostly unresponsive to any yearly hydrologic change, though these deep systems have not been fully studied.

### ***Segment 1: Merced River Above Nevada Fall***

The Merced River High Sierra Camp has a seasonal water system that draws surface water from the Merced River. This water system serves tent-style lodging, a kitchen/store, shower facilities, flush toilets, and a backpacker campground. Approximately 50—150 persons can use this water system on a daily basis. The camp is operational from early July through early September. The system has a design capacity of approximately 3,000 gallons per day and is regulated by a permit from the California Department of Health Services.

### ***Segments 2, 3, and 4: Yosemite Valley, Merced Gorge, and El Portal***

In 1985, the NPS stopped using surface water in Yosemite Valley and the El Portal area (diversions from the Merced River) and began drawing from newly drilled groundwater wells. Currently, groundwater pumping in Yosemite Valley provides up to 200 million gallons of water annually from three supply wells with a capacity up to 1,000 gallons per minute (ROCHE 2012). During peak visitation, between July and September, groundwater pumping can reach up to 700,000 gallons per day. This pumping rate can equal as much as 5% of the total flow of the Merced River. However, observations and modeling of the surface-groundwater interactions of the Merced River and the underlying water table have concluded that the impact of groundwater pumping on streamflows in the Merced River is small (Newcomb and Fogg 2011). Groundwater is used in both Yosemite Valley and El Portal for potable water supplies. In El Portal, six wells support a capacity of approximately 220 gallons per minute (Whitfield and Barton 2004).

### ***Segments 5, 6, 7, and 8: South Fork Merced River***

Water supplies along the South Fork Merced River and Wawona segments come from both surface water withdrawals and groundwater wells. Four potable water distribution systems and multiple private wells supply water to the Wawona area. The NPS is responsible for operating one of the distribution systems that supplies surface water from the impoundment on the South Fork Merced River to NPS and concessioner employee residences, the Wawona Hotel, the Wawona Campground, and 30 private residences. The NPS's potable water production system is regulated under a Regional Water Quality Control Board permit and is designed to draw 480 gallons per minute (1.1 cubic feet per second). In 1987, NPS implemented the *Wawona Water Conservation Plan*, which set the rate of diversion from the Wawona water intake at 288 gallons per minute (0.59 cubic feet per second) (NPS 1987C). To protect in-stream flows for aquatic habitat, the plan enacted mandatory water conservation whenever the river reaches flows of less than 6 cubic feet per second. At flows of less than 6 cubic feet per second, diversions are limited to 10% of the river flow. Recently modeling efforts have concluded that aquatic habitats in the South Fork Merced River have likely not been affected by water diversions in Wawona, though a potential for detrimental effects occurs at very low flows associated with droughts (Holmquist and Waddle 2011). No other diversions take place on the South Fork Merced River (Wood 2004).

## **Water Quality**

The U.S. Geological Survey began monitoring water quality constituents at the Happy Isles gage in 1968, and water quality monitoring in the Merced River is ongoing. The NPS published a comprehensive water quality report in 1994, which established baseline water quality data for the

Merced River. This report found that the river's water quality was exceptionally high, with relatively few impacts caused by development and visitor use. More recently, studies that measured a wider range of constituents have revealed that some anthropogenic pollutants (e.g., petroleum hydrocarbons) are present in the Merced River, though concentrations of these pollutants are well below established water quality thresholds (Clow et al. 2011; Peavler et al. 2008). Yosemite's Visitor Use and Impact Monitoring Program has collected water quality and streambank stability information since 2004. Through the monitoring program, NPS tests for such water quality constituents as nutrients, E. coli, and petroleum hydrocarbons, and characterizes streambank stability by measuring channel dimensions, bank vegetation cover, substrate size, and the amount of large wood in the channel (Newburger et al. 2009d).

The Central Valley Regional Water Quality Control Board's *Water Quality Control Plan* designates the Merced River and South Fork Merced River with existing beneficial use for irrigation; wildlife habitat; and freshwater habitat; as well as recreational activities that include canoeing, rafting, noncontact recreation, and water contact recreation (Central Valley Regional Water Quality Control Board 2010).

High water quality is critical for the survival and health of species associated with riparian and aquatic ecosystems. Water quality elements that affect aquatic ecosystems include water temperature, dissolved oxygen, suspended sediment, nutrients, and chemical pollutants. These elements interact in complex ways within aquatic systems to directly and indirectly influence patterns of growth, reproduction, and mobility of aquatic organisms. Potential contributors to water quality impacts within the study area are briefly summarized below. A discussion of water quality within the Merced River segments follows.

### *Sources of Water Quality Impacts*

**Bank Erosion.** Water quality has the potential to be affected in areas where visitor use of the Merced River is high. High use of the streambank induces bank erosion through the loss of vegetative cover and soil compaction. Bank erosion can result in the widening of the river channel and loss of riparian and meadow floodplain areas. Water quality can then be altered through increased suspended sediments caused by erosion, higher water temperatures from a lack of riparian cover, and lower dissolved oxygen levels due to elevated temperatures and shallower river depths.

**Nonpoint Pollution Sources.** Human activities and the use of vehicles can result in potential water pollutants that may collect on land surfaces and later be transported into the river or its tributaries by stormwater runoff. Recreational activities, such as pack animal use, swimming, and hiking, can lead to the introduction of organic, physical, and chemical pollutants into aquatic systems. Nonpoint-source runoff from roads and parking lots may potentially affect water quality by contributing hydrocarbons and heavy metals to land surfaces. Additionally, sediment derived from road sanding during winter can contribute elevated sediment loads to area waterways.

Stormwater runoff from developed surfaces is discharged directly or indirectly into the Merced River and other streams and lakes throughout the park. In the Yosemite Wilderness, nonpoint-source pollutants include human and pack animal wastes and sediments contributed through erosion (Derlet et al. 2008). These sources have the potential to affect water quality in all segments of the Merced River.

In addition to local sources, water resources in the park can be affected by regional air pollution through atmospheric deposition (Clow et al. 1996). The entire Sierra Nevada range is sensitive to acid precipitation due to its granitic substrate and the resulting low-buffering capacity of its water resources (Melack et al. 1982). The Sierra Nevada are also sensitive to nitrogen deposition from remote fossil fuel emissions (Clow et al. 2010). Ongoing studies are examining the effects of external and internal air pollutants on natural resources, including surface water resources.

**Underground Tanks and Abandoned Landfills.** Numerous underground storage facilities exist within the park, including fuel and waste storage tanks. Since 1986, more than 100 underground tanks have been located and removed. The park currently has over 30 known contamination sites from leaking underground storage tanks. The park also contains a number of old landfill and surface dumpsites that are potential contaminant sources impacts to water quality.

**Point Sources of Pollution.** Point sources of pollution include discharges from pipes or other devices where the discharge can be traced to a single point or location. Facilities in Yosemite Valley and El Portal are connected to a wastewater collection system that terminates at the El Portal Wastewater Treatment Plant. Treated wastewater is discharged to percolation and evaporation ponds at the treatment facility. Water quality impacts from wastewater may occasionally occur as a result of sanitary sewer overflow. A tertiary wastewater treatment plant serves public and private sources in Wawona, and the treated wastewater is used to irrigate the Wawona Golf Course. Periodically, the treated wastewater is discharged to the South Fork of the Merced River, when the storage capacity is insufficient and use for golf course irrigation is not feasible. Both wastewater facilities are regulated by the Central Valley Regional Water Quality Control under the National Pollutant Discharge Elimination System.

**Fires.** Fire is a natural component of the Sierra Nevada region and Yosemite National Park. The recurrence of fire shapes the ecosystems of the park, with many common plants exhibiting specific fire-adapted traits. The NPS has adopted a *2004 Fire Management Plan/EIS* (NPS 2004b), which has clear guidelines about when and where to allow natural and prescribed fires to burn. The effects of fire on water quality are potentially large due to increases of fine sediment, mass wasting events (e.g., landslides), and alteration of runoff patterns. However, the impacts of fire on water quality are generally short-lived and part of the natural watershed response. With respect to the use of fire retardants, the *Fire Management Plan* addresses the use of fire retardant and its potential effects on water quality, which are generally temporary effects primarily associated with the addition of nutrients.

### ***Segment 1: Merced River Above Nevada Fall***

Although limited data has been collected for Segment 1, the available information indicates that water quality is high (Clow et al. 1996). Nutrient levels are generally low (Clow et al. 2011). Nitrogen concentrations are higher above Nevada Fall than in Yosemite Valley, which is consistent with the lower rate of nitrogen assimilation that occurs at higher elevations (Clow et al. 2011).

Several studies have attempted to discern a link between pack stock use and transport of pathogens to receiving waters in rivers (Derlet and Carlson 2002; Derlet and Carlson 2006; and Derlet et al. 2008). These studies establish that pack stock manure can potentially contain pathogens, though the extent to which these same pathogens can be transported into rivers and streams remains unclear. A more

comprehensive water quality study on the main stems of rivers in Yosemite conducted over multiple months in multiple years has found low levels of *E. coli* in Yosemite wilderness waters (Clow et al. 2011). It is possible that localized impacts to water resources from pack stock use may occur (at trail crossings on smaller tributary streams for example), though these impacts do not appear to propagate to the main river channels. While rigorous scientific studies establishing the nature and extent of potential impacts to water quality resulting from pack stock use are not yet available, existing peer-reviewed research (Clow et al. 2011) indicates that overall water quality in Yosemite wilderness remains high.

### *Segment 2: Yosemite Valley*

Water quality in Yosemite Valley is high, with minor indications of impacts from human activities. Surface water is generally low in nutrients, salts, and suspended sediment and high in dissolved oxygen. Most water quality constituents are measured near natural background levels. Occasional concentrations above freshwater criteria are noted for lead, cadmium, and mercury (NPS 1994a). Given the proximity of the Merced River to development in Segment 2, these pollutants may have originated as runoff from impervious surfaces (such as parking lots and roads) or leakage from underground tanks or landfills. Bacteria levels are higher in the vicinity of Sentinel Bridge and Pohono Bridge than elsewhere in the watershed, but levels are well below public health limits (Clow et al. 2011).

Nutrient concentrations are very low (Brown and Short 1999) and have been near background levels for similar undeveloped areas (Clow et al. 2011). Nitrogen concentrations are lower in Yosemite Valley than in the watershed above Nevada Fall, which is consistent with the effects of atmospherically deposited nitrogen and the lower rate of nitrogen assimilation that occurs at higher elevations. Phosphorus levels are higher in Yosemite Valley than levels above Nevada Fall, reflecting typical patterns of phosphorus weathering due to increased drainage area size (Clow et al. 2011). Dissolved oxygen levels are very high, with most samples near 100% saturation (Brown and Short 1999). Nine to 14% of water quality samples in Yosemite Valley indicate some presence of petroleum hydrocarbons (Peavler et al. 2008), most likely due to stormwater runoff from parking lots and roads, however concentrations are well below water quality limits. Eleven percent of samples contained detectable concentrations of petroleum hydrocarbons. The median concentration of samples with petroleum hydrocarbons detected was 0.023 milligrams per liter (Peavler et al. 2008), whereas the water quality action level for California waterbodies is 15 milligrams per liter (California State Water Resources Control Board 2007).

### *Segment 3 and 4: Merced Gorge and El Portal*

Limited water quality data have been collected in the Merced gorge, but available data indicates that water quality characteristics are similar to those in the Merced River in Yosemite Valley. Nutrient concentrations are very low (Brown and Short 1999) and have been found to be near the background levels in similar undeveloped areas (Clow et al. 2011). Dissolved oxygen levels are very high, with most samples near 100% saturation (Brown and Short 1999).

Water quality in the Merced River near El Portal is high, with minor indications of impacts from human activities. The water is low in nutrients, salts, and suspended sediment and high in dissolved oxygen (NPS 1994a). Bacteria levels are generally low (Peavler et al. 2008), and dissolved oxygen is near saturation (Peavler et al. 2008). Nutrient concentrations are slightly elevated near the El Portal Wastewater Treatment Plant, especially during periods of low streamflow. However, water quality is still within established limits (Peavler et al. 2008; Clow et al. 2011).

#### ***Segment 5, 6, 7, and 8: South Fork Merced River***

Water quality in the South Fork Merced River in Segments 5, 6, 7, and 8 is high, with minor indications of impacts from human activities. The water is low in nutrients, salts, and suspended sediment (NPS 1994a). Bacteria levels are generally low (Peavler et al. 2008), and dissolved oxygen is near saturation (Peavler et al. 2008). Elevated phosphorus levels have been detected on the South Fork Merced River downstream from the Wawona Campground. The presence of hydrocarbons was found in 11% of water quality samples in Wawona, but was far below water quality limits (Peavler et al. 2008).

### **Floodplains**

Within the park, flood levels depend on the amount of snowpack, water content of the snowpack, rate of snowmelt, and amount and timing of rainfall. Although most of the park's precipitation occurs between October and April, melting of the snowpack caused by warming springtime temperatures usually signals the beginning of an increase in streamflow that persists into June (Madej 1994). Flood events associated with this flow increase are often termed spring floods. Under normal conditions most of the runoff occurs from mid-April through July, with peak flows in May and June. From 1916 through 1989, 124 of 140 recorded high flows on the Merced River in Yosemite Valley occurred in response to snowmelt (Madej 1994). A second type of flood typical of the Merced River can occur between September and April and is commonly referred to as a winter flood or a rain-on-snow event (Madej 1994). These floods occur when a storm is accompanied by warm air temperatures and rainfall and coincides with the presence of snow in the vicinity of the storm. Although these events account for only about 10% of the floods in the park, they are responsible for the highest floods recorded, as seen by the events of January 1997. The January 1997 flood resulted from high elevation, heavy, warm rains that melted snow, thereby contributing to excessively high volumes of surface runoff (NPS 1997b). Rain alone occasionally causes peak discharge events that are usually local in nature but sometimes cover a large area.

Frazil ice, while less common, is another cause of flooding within the park. Frazil ice is a phenomenon that occurs in connection with waterfalls. Small ice crystals develop in turbulent, super-cooled stream water at the base of a waterfall when air temperature suddenly drops below freezing. The ice crystals join to become slush and then press together as more crystals form. Frazil ice lacks the erosional force of regular stream ice, but it can cause streams to overflow their banks and change course. Frazil ice sometimes reaches a depth of more than 20 feet along Yosemite Creek at the Lower Yosemite Fall Bridge. A 1954 flow of frazil ice completely filled the streambed of the creek and covered the footbridge near Lower Yosemite Fall with many feet of ice (Hubbard and Brockman 1961). The Yosemite Falls footbridge was covered with frazil ice in February 1996.

Flooding plays a necessary role in the overall adjustment of a river system. Periodic flooding provides sediment and nutrients that are essential for the aquatic and vegetative health of the floodplain. Floodplains are features that are both the products of the river environment and important functional parts of the system. However, human-made structures, such as bridges and buildings, placed within a floodplain can impede natural flow and result in injury to visitors and damage to structures. Discussion of flooding and floodplains is most relevant to the potential loss of life and the influence on the Merced River from development in the floodplain.

In areas where dynamic natural processes cannot be avoided, developed facilities should be sustainably designed (e. g., removable in advance of hazardous storms or other conditions). When facilities must be located in such areas, their design and siting would be based on (1) a thorough understanding of the nature of the physical processes, and avoiding or mitigating the risks to human life and property; and (2) the effect of the facility on natural physical processes and the ecosystem (Director's Order #77-2 [*Floodplain Management*]).

### ***Segment 1: Merced River Above Nevada Fall***

The Merced River's floodplains in remote areas above Nevada Fall have not been defined. Steep topography limits the floodplain in the upper canyon areas. Within Little Yosemite Valley, the floodplain likely encompasses most of the valley floor; however, the 100-year floodplain has not been mapped here.

### ***Segment 2: Yosemite Valley***

Regular flooding and subsequent deposition of alluvial sediments have been instrumental in the formation of Yosemite Valley. Flooding continues to support a variety of natural processes in Yosemite Valley, such as deposition of flood-borne sediment; channel avulsion (i.e., abandonment of an old river channel and the creation of a new one); and the development of complex channel patterns and valuable riparian and wetland habitat. Significant flood events continue to alter the floodplain of Yosemite Valley. The largest events occurred in 1937, 1950, 1955, and 1997, with peak discharges measured in the range of 22,000 to 25,000 cubic feet per second at Pohono Bridge. These floods were the result of rain-on-snow events during which rain fell on winter snowpack and caused snowmelt in combination with rain-related runoff.

The January 1997 flood was the largest recorded flood within the park with a peak discharge of 10,000 cubic feet per second at Happy Isles and 25,000 cubic feet per second at Pohono Bridge (Eagan 1998). The flood inundated roads, picnic areas, park offices, and lodging units. It caused extensive damage to NPS facilities, including roads, bridges, buildings, and Yosemite Valley's electric, water, and sewer systems. The flood also altered natural features and caused downed trees, movement of landslide talus into streams, channel erosion, and substantial changes in channel morphology (NPS 1997b). This flood was estimated to have a recurrence interval of 90 years (NPS 1997b), or about a 1.1% chance of occurring in any given year. NPS staff mapped the actual extent of the 1997 flood inundation in Yosemite Valley and El Portal. These data were used to establish the 100-year floodplain in Yosemite Valley.



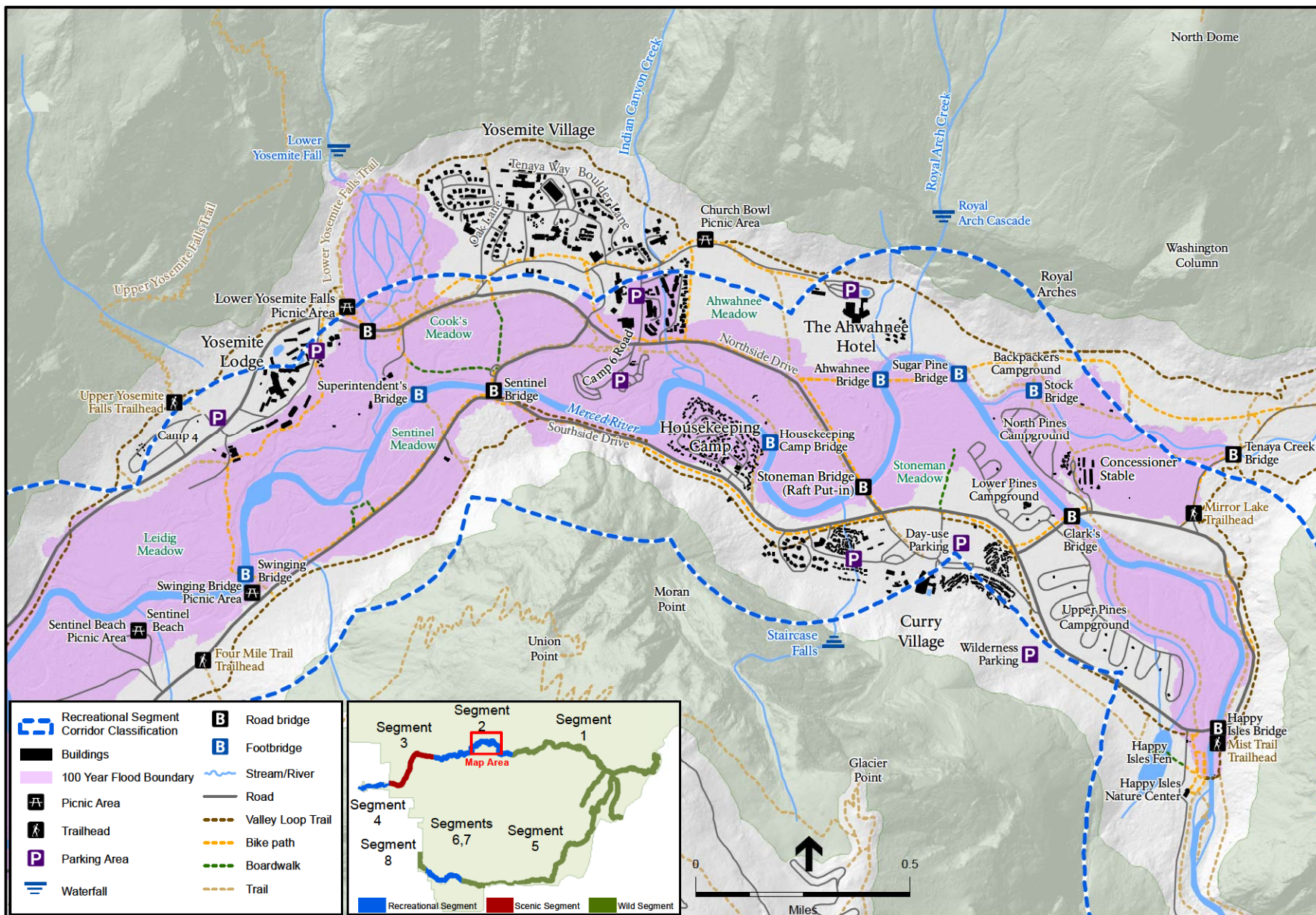
In Yosemite Valley, the character of the floodplain varies in different locations due to local hydraulic controls. From Clark's Bridge to Housekeeping Camp in the east Valley, the Merced River floods areas outside the main river channel with shallow swift flows that cut across meander bends. Near Yosemite Lodge and downstream to the El Capitan moraine, flood waters back up against the dense vegetation and tend to be deep, low velocity, and low energy. From the El Capitan moraine downstream, the river channel is steeper and confined in the narrow river canyon, the floodplain is narrow, and flow velocities are high.

As shown in **figures 9-3 and 9-4**, the following facilities are located within the 100-year floodplain in Segment 2:

- portions of the Upper Pines Campground area, including six individual campsites and a recreational vehicle dump station
- portion of Lower Pines Campground, including four restrooms
- most of North Pines Campground, including four restrooms and a lift station
- portion of Backpackers Campground
- most of the Curry Village stables and associated housing, including 18 housing units and a community kitchen
- most of Housekeeping Camp, including lodging units, bathrooms, and other structures
- two small employee apartment buildings in Yosemite Village
- concession headquarters (General Office)
- Residence 1 and the associated garage
- Yosemite Lodge structures: the Maple, Alder, Hemlock, and Juniper motel units, six miscellaneous structures near the Wellness Center, and three miscellaneous small structures near Dogwood Cottage
- Yosemite Creek sewage lift station
- groundwater wells near Yosemite Creek
- kennel in Lamon Orchard

### ***Segments 3 and 4: Merced Gorge and El Portal Watershed***

From the location of the former Cascades Diversion Dam downstream to the El Portal Administrative Site, the river channel is steep and confined to a narrow river gorge. In this area, the floodplain is narrow and flow velocities are very high. The Merced River channel in El Portal can shift during large floods, including movement of large boulders that define the channel. Within this area, El Portal Road and small levees alter the floodplain by restricting flow during flood events and forming a barrier to channel migration. Noted above, fill material precludes the Merced River's utilization of the floodplain area of the former Greenemeyer sand mining operation. During extreme flood events, the river has shown the capability to undermine or spill over and damage the roadway.



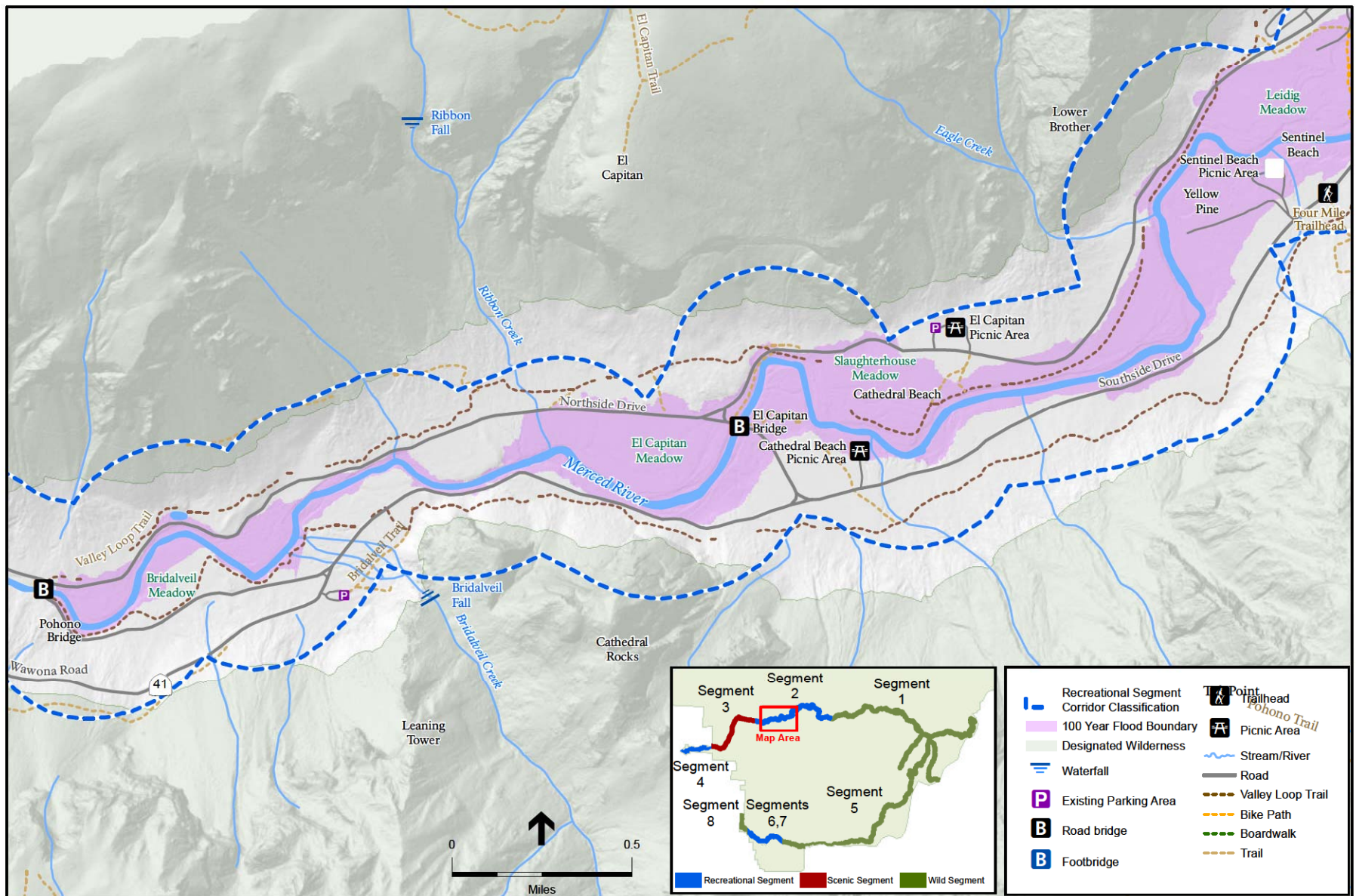
SOURCE: NPS, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-3**

100-Year Flood Zone at Yosemite Valley East





SOURCE: NPS, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-4**

100-Year Flood Zone at Yosemite Valley West

In El Portal, the 100-year discharge of the Merced River is estimated to be 32,800 cubic feet per second (PBS&J 2011). Hydraulic modeling of the Merced River at this location indicates that under the 100-year event, minor flooding occurs on the right (north) floodplain near the El Portal support facility. Portions of the El Portal Administrative Site parking areas and access roads are within the 100-year floodplain. Further upstream, portions of Highway 140, portions of El Portal Trailer Village and El Portal Market are all within the 100-year floodplain.

As shown in **figure 9-5**, the following facilities are located within the 100-year floodplain in Segments 3 and 4:

- El Portal Special Park Uses Trailers
- Embankment/levee between El Portal Market and gas station
- Portions of Odger's fuel transfer center
- Portions of Abbieville and Trailer Court
- NatureBridge office and dorm

#### ***Segments 5, 6, 7, and 8: South Fork Merced River***

Within Wawona, the 100-year discharge of the South Fork Merced River is estimated to be 19,700 cubic feet per second (PBS&J 2011). The 100-year floodplain inundation area along Segments 5, 6, 7, and 8 is fairly limited, except in the Wawona area, because of the river corridor's steep topography. Within Wawona, most development is located outside of the 100-year floodplain.

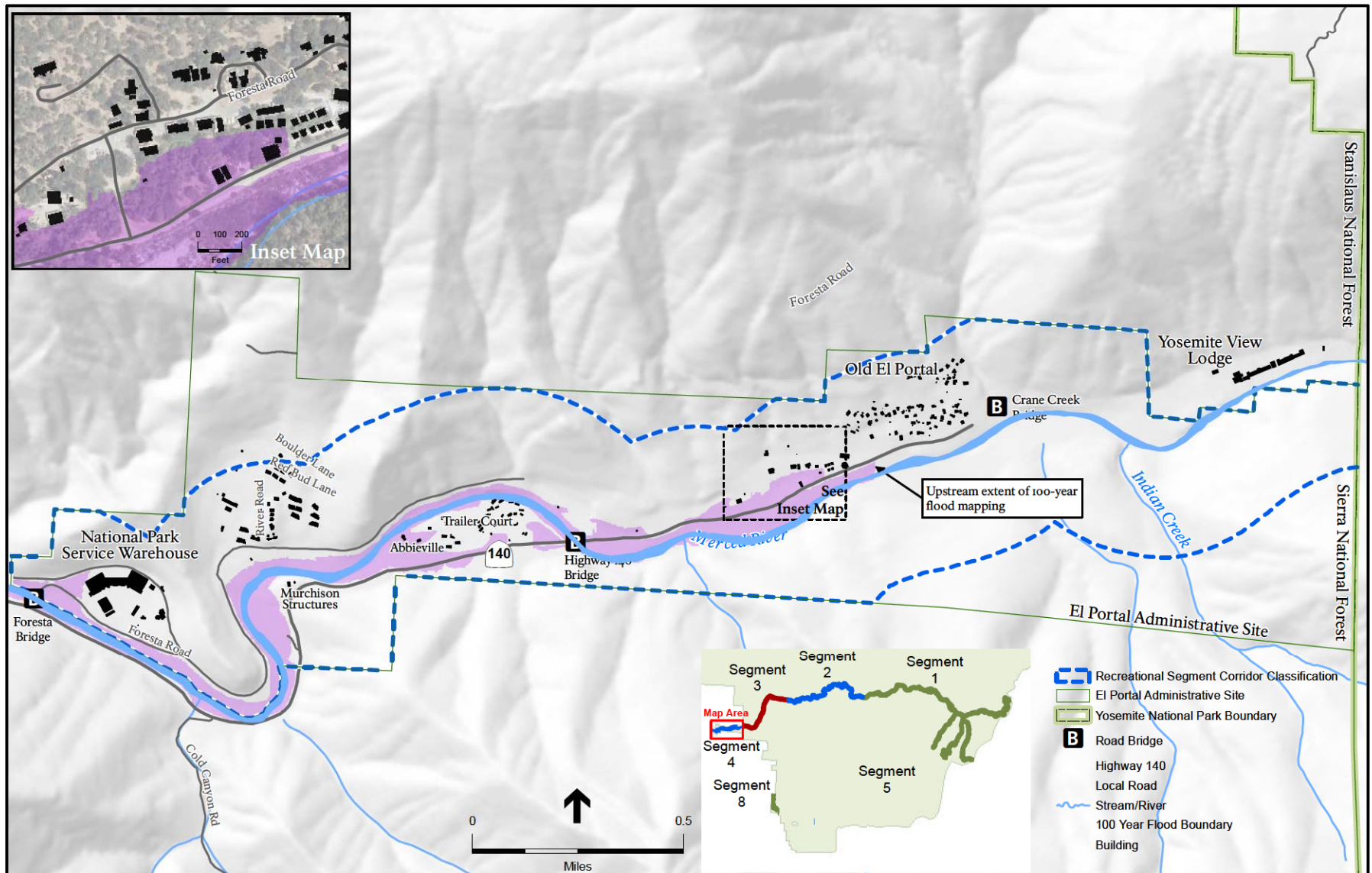
As shown in **figure 9-6**, the following facilities are located within the 100-year floodplain in Segment 7:

- portions of the Pioneer Yosemite History Center
- Wawona Covered Bridge and Wawona Road Bridge
- Portions of Wawona Campground
- South Fork Wawona Picnic Area

#### ***Environmental Consequences Methodology***

Proposed management actions for each alternative are evaluated in terms of the context, intensity, and duration of the hydrologic impacts, and whether the impacts are considered beneficial or adverse to the hydrologic environment.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a designated segment of the river (i.e., 1-8). This analysis further identifies whether there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the Merced River corridor and the project area within Yosemite National Park. Regional impacts would potentially have an influence throughout the Sierra Nevada.

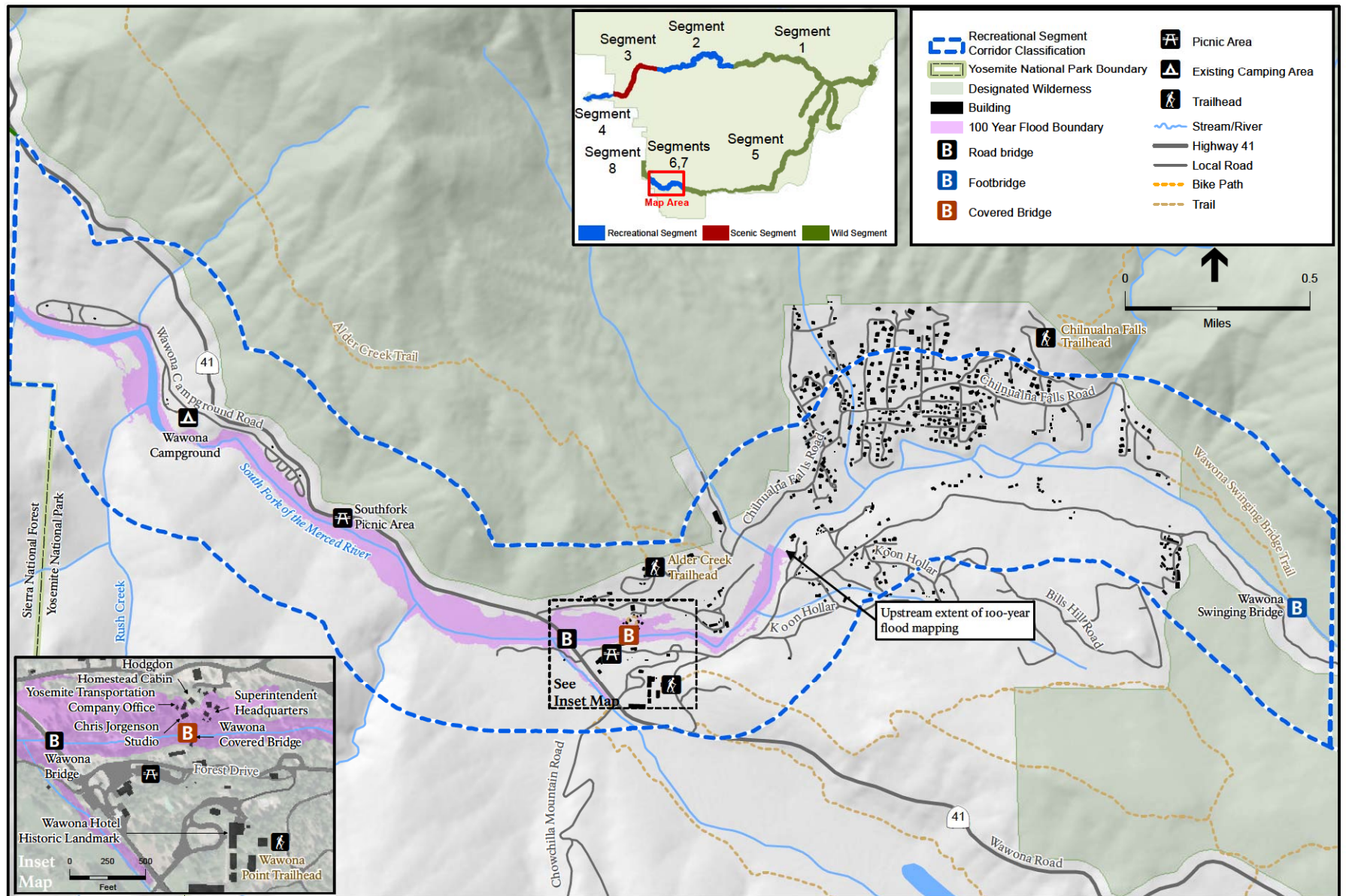


SOURCE: NPS, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-5**  
100-Year Flood Zone at El Portal





SOURCE: NPS, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-6**  
100-Year Flood Zone at Wawona

- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts would not be detectable and would have no discernible effect on the hydrology of the Merced River or detectable change in water quality constituents. Minor impacts on hydrologic processes or water quality constituents would be slightly detectable, but would not be expected to have an overall effect on the character of the river, its floodplain, or water quality. Moderate impacts on hydrology would be clearly detectable, and could have an appreciable effect on hydrologic processes and the adjacent floodplain. Moderate impacts on water quality would cause a clearly detectable change in water quality constituents, but would not exceed public health or aquatic habitat thresholds. Major impacts on hydrology would have a substantial, highly noticeable influence on the hydrologic environment and could permanently alter river processes, floodplain formation, and evolution. Major impacts on water quality would cause water quality constituents to exceed public health or aquatic habitat thresholds.
- **Duration.** The duration of an impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional activities, such as facility construction or road removal. A long-term impact would have a permanent effect on the hydrologic environment, such as altering the dynamic processes that govern the free-flowing nature of the river, floodplain formation and evolution, or the condition of water quality.
- **Type of Impact.** Impacts were evaluated in terms of whether they would be beneficial or adverse to the hydrologic environment. Beneficial impacts would sustain streamflow dynamics, allow natural processes to prevail, and protect or improve water quality. Adverse impacts would negatively alter hydrologic processes, thereby hindering natural processes and reducing protection of the river, its floodplain, and water quality.

### ***Environmental Consequences of Alternative 1 (No Action)***

The following discussion provides an overview of the impacts on hydrology (including related processes, such as stream erosion and channel migration); floodplains; and water quality that could occur within each segment of the Merced River corridor from application of Alternative 1 (No Action).

#### **Impacts Common to Segments 1–8**

##### ***Impacts of Actions to Protect and Enhance River Values (Corridorwide Actions)***

Under Alternative 1, the NPS would continue maintenance and management practices that maintain existing improvements within the Merced River corridor. Specific practices are described in detail below.

**Hydrology.** Existing riprap interferes with natural river processes. For example, replacement of riparian vegetation with riprap generally increases flow velocities, which results in a higher frequency and intensity of erosive flows, and therefore leads to increased erosion and associated river widening. Persistence of riprap and revetment would continue to cause erosion and river widening in a detectable manner and would result in a corridorwide, long-term, minor, adverse impact on hydrology.



Abandoned infrastructure, such as underground pipelines, wastewater treatment facilities, and manholes that affect hydrology would remain. These facilities contribute to dewatering of meadows and alteration in the natural hydrologic regime of the Merced River, increasing the amount and altering the timing of runoff entering the river. Allowing abandoned infrastructure to remain would continue to affect the hydrology of the river in a detectable manner near abandoned infrastructure locations and would result in a local, long-term, minor, adverse impact on hydrology.

Large wood would continue to be removed from the river due to safety concerns and infrastructure protection, particularly in the areas around the campgrounds and areas where rafting occurs. Removal of large wood can result in a reduction in channel complexity and a reduction in natural channel processes. These would be expected to occur in a slightly detectable manner and would result in a corridorwide, long-term, minor, adverse impact on hydrology.

Informal trailing that fragments meadow habitat and alters meadow hydrology would continue. Areas that have been denuded of vegetation due to trampling would be remain, resulting in compacted soils and altered runoff characteristics. This would result an alteration of the runoff characteristics of the meadow from natural conditions, though not in a detectable manner. These actions would result in a local, long-term, negligible, adverse impact on hydrology.

The NPS would not establish an official riparian buffer to protect water quality and riparian habitat. A riparian buffer is a strip of riparian vegetation along the banks of a river that filters runoff and provides a transition zone between the river and human land use. The concept of a riparian buffer to protect river resources is well established in the scientific literature and has been applied by numerous federal, state, and local land management agencies. The effective width of a riparian buffer depends on local topography, soil, vegetation type(s), and the nature and extent of human land use.

The primary justifications for employing a riparian buffer are to protect water quality and riparian habitat. Riparian buffers help trap pollutants that could otherwise directly enter the river, improving water quality. Buffers reduce overland flow, absorb sediment, and attenuate compounds such as nitrogen and phosphorous and pathogens such as *E. coli*. Riparian buffer vegetation helps to stabilize riverbanks, reduce erosion, and regulate river flow by allowing surface water to infiltrate the soil. Riparian buffer vegetation provides a source of large wood to the river and adjacent floodplain. Riparian buffers enhance important habitat for birds and other wildlife by allowing establishment of new vegetation and persistence of a complex habitat structure. Buffers also protect aquatic ecosystems by providing organic nutrients, supplying woody debris, and moderating water temperatures by shading.

The lack of protection that would occur in the absence of a riparian buffer can lead to trampling of streambanks and, as a result, an alteration of natural stream processes. Visitor use would continue on sensitive banks of the Merced River. Locations include those adjacent to Lower Pines and North Pines campgrounds, Yosemite Lodge beach access, Swinging Bridge Picnic Area, Sentinel Beach Picnic Area, Cathedral Beach Picnic Area, Devil's Elbow, riverside areas between Pohono Bridge and the El Portal Road/Big Oak Flat Road intersection, and along the Valley Loop Trail. The resulting alteration of natural stream processes would result in a local, long-term, minor, adverse impact on hydrology.

Localized riverbank erosion, and scouring effects associated with bridges would remain. Erosion and scouring effects from bridges would continue to result in alteration of stream hydrology. This would result in a local, long-term, major, adverse impact on hydrology.

**Water Quality.** Persistence of riprap and revetment would continue to cause erosion and result in a detectable increase in fine sediment loading in the Merced River and would result in a corridorwide, long-term, minor, adverse impact on water quality.

Areas of denuded vegetation resulting from informal trailing have the potential to result in an increase in soil erosion, likely resulting in a nondetectable increase in fine sediment in the Merced River. This would have a local, long-term, negligible, adverse impact on water quality.

The lack of a riparian buffer can lead to increased soil erosion and the introduction of fine sediment to the Merced River. Lack of a riparian zone also decreases the filtering/interception capacity of riparian vegetation that would otherwise reduce and moderate sediment and nutrient inputs from upland areas. This would result in a local, long-term, minor, adverse impact on water quality.

Continued erosion due to trampling of streambanks would be expected to occur on an ongoing basis. This would contribute to an increase in fine sediment levels in the Merced River, resulting in a local, long-term, minor, adverse impact on water quality.

Ongoing scouring due to bridges would continue in a clearly detectable manner. This would result in an increase in fine sediment levels in the Merced River, resulting in a local, long-term, minor, adverse impact on water quality.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** The continued presence of the Nevada Fall Diversion Dam, and of the diversion for the Merced Lake High Sierra Camp would minimally alter the natural processes of the Merced River, but would not have an overall effect on the character of the river. This would result in a local, long-term, negligible, adverse impact on hydrology. Informal trails at Triple Peak Fork, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and continued administrative pack stock grazing at the Merced Lake Ranger Station Meadow have resulted in compacted soils, which can alter the runoff characteristics of the area, though not in a detectable manner. This would result in a local, long-term, negligible, adverse impact on hydrology.

**Water Quality.** Water quality in Segment 1 would be expected to remain high, with isolated instances of minor contamination, especially after storm events, but would not be expected to exceed water quality standards. The continued presence of braided trails at Triple Peak Fork, wetlands near Echo Valley and Merced Lake shore, mineral springs between Merced Lake and Washburn Lake, and continued administrative pack stock grazing at the Merced Lake Ranger Station Meadow have the potential to cause denuded vegetation and compacted soils resulting in an increase in fine sediment concentrations in the Merced River, though not in a detectable manner. These actions would have a local, long-term, negligible, adverse impact on water quality.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** Impacts on hydrology resulting from visitor use would remain negligible due to the continuation of the wilderness trailhead quota system. Designated camping in Moraine Dome and Little Yosemite Valley would remain, resulting in a negligible amount of trampling and soil compaction. This would have a local, long-term, negligible, adverse impact on hydrology.

**Water Quality.** Water quality would remain high in Segment 1. Designated camping in Moraine Dome and Little Yosemite Valley would remain, resulting in a negligible amount of trampling and erosion. This would have a local, long-term, negligible, adverse impact on water quality.

**Merced Lake High Sierra Camp.** Under Alternative 1, 22 units (60 beds) would remain at Merced Lake High Sierra Camp. The continued presence of these facilities would result in continued trampling within the existing camp area, which would result in continued local, long-term, negligible, adverse impacts with respect to water quality, due to very minor increases in erosion associated with trampled areas. Use of flush toilets under existing conditions also contributes to local, long-term, negligible, adverse effects on water quality.

**Segment 1 Impact Summary:** The continued presence of infrastructure and visitors within Segment 1 would have a local, long-term, negligible to minor, adverse impact on the river's hydrology and water quality.

**Segment 2: Yosemite Valley***Impacts of Actions to Protect and Enhance River Values*

**Hydrology.** Under Alternative 1 (No Action), existing bridges in this segment would remain in their current locations and configurations. Bridges would continue to constrict flow, exacerbate scour, and cause streambank erosion leading to continued impediments to hydrology and the free-flowing character of the Merced River. Flow constrictions associated with bridges would continue to create backwaters during high flows, rapid channel scour, and create excessive sediment deposition upstream and downstream. The potential for channel avulsion (rapid formation of a new channel) would continue near bridges that severely constrict flow. This would cause corridorwide, long-term, moderate, adverse impacts on hydrology. The area around Sugar Pine Bridge could experience more substantial impacts, possibly with major intensity. The bridge has been identified as severely constricting flow and increases the potential for major channel avulsion. However, because channel avulsion did not take place during the 1% chance flood that occurred in 1997, the potential for a major impact to occur is estimated to be small.

Abutments and infrastructure associated with the former bridge at Happy Isles and the gage base would remain in their current location and condition. The infrastructure associated with the Pohono Bridge gaging station would also remain in place. The continued presence of these structures would slightly alter the natural processes of the Merced River, but would not have an overall affect on the character of the river. This would result in a local, long-term, minor, adverse impact on hydrology.

The NPS has largely ceased removal of large wood from the river since the mid 1990s; however, wood continues to be removed when it threatens infrastructure or public safety. Large wood loading is expected to increase in the future due to this changed practice, leading to in a corridorwide, long-term, minor, beneficial impact on hydrology.

Withdrawals of groundwater would continue at the present rate. Observations and modeling of the surface-groundwater interactions of the Merced River and the underlying water table have concluded that the impact of groundwater pumping on streamflows in the Merced River is small (Newcomb and Fogg 2011). Continuing groundwater pumping would have a corridorwide, long-term, negligible, adverse impact on hydrology.

Human-constructed ditches, pipelines, and underground tiles would remain in meadows throughout this segment, contributing to meadow dewatering. Abandoned roadbeds would continue to disconnect meadow areas from the Merced River. Compacted soils due to informal trailing would continue to persist, reducing infiltration. Informal shoulder parking would continue to encroach on meadows, affecting the hydrologic regime by destroying native vegetation and compacting soils, resulting in less infiltration of runoff. Under Alternative 1 (No Action), local, long-term, moderate, adverse impacts on the 100-year flood regime and floodplain would continue.

Continuing these actions would slightly alter runoff characteristics in this segment, but would not be expected to affect runoff in a detectable manner, resulting in a corridorwide, long-term, negligible, adverse impact on hydrology.

Visitor use and informal parking along the river would continue to result in the use and expansion of informal trailing, riverbank erosion, and loss of riparian vegetation, leading to a corridorwide, long-term, minor, adverse impact on hydrology.

**Water Quality.** Water quality in Segment 2 would be expected to remain high, with isolated instances of minor contamination especially after storm events, but would not be expected to exceed water quality standards. Informal trails and informal river access would continue to cause trail and streambank erosion, resulting in suspended sediments entering the river. Riverbank widening would continue unmitigated in Segment 2. Informal parking would continue to denude vegetation, leading to an increase in erosion. This would result in a local, long-term, minor, adverse impact on water quality.

Water supply and wastewater infrastructure, including water supply wells, dump stations, and sewage lift stations, would continue to be located in the 100-year floodplain. During floods, these facilities have the potential to release contaminants to the river, resulting in a corridorwide, short-term, minor, adverse impact on water quality during storm events.

**Floodplains.** Roadways, structures, and visitor use areas would continue to be present in the floodplain and would be subject to flood hazards under Alternative 1 (No Action). Water supply and wastewater infrastructure, including water supply wells, dump stations, and sewage lift stations, would continue to be located in the 100-year floodplain, resulting in a local, long-term, minor, adverse impact on floodplains.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** Visitor use of the Merced River corridor would continue to affect the hydrology of the river. Visitor use would continue to affect the adjacent floodplain by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Modifications to the river channel and floodplain (through soil compaction, loss of riparian vegetation, and accelerated erosion) could result in channel widening, streambank instability, loss of riparian cover, and channel erosion, which would cause an increase in fine sediment concentrations and decrease in overbank flooding. Continued concentrated visitor use on riverbanks would adversely affect floodplains in the Merced River corridor, especially in east Yosemite Valley. This effect would worsen over time as visitor use increased, and would constitute a corridorwide, long-term, minor, adverse impact on hydrology.

Where campsites were damaged and subsequently removed following the 1997 flood, these areas would be expected to continue to passively restore to natural conditions, resulting in a local, long-term, minor beneficial effect on hydrology.

Informal parking and informal trailing would continue to occur in Segment 2, causing compacted soils, denuded vegetation, and an alteration in the runoff characteristics of the area. This would result in a corridorwide, long-term, minor, adverse impact on hydrology.

**Water Quality.** Visitor use of the Merced River corridor would continue to slightly affect water quality, though water quality would still meet federal standards and would not be expected to occur in a detectable manner. Visitor use would continue to lead to trampling, reducing vegetative cover, altering streambanks, and inducing erosion. This would result in increased fine sediment concentrations and decreased overbank flooding. New parking areas located at Camp 6 would result in slight increases in the release of sediment and automobile related pollutants into stormwater, constituting a corridorwide, long-term, minor, adverse impact on water quality.

**Floodplains.** Several housing facilities, tent-style lodging, and campgrounds would continue to be partially located within the 100-year floodplain, including Housekeeping Camp, North Pines, Backpackers, Lower Pines, Tecoya concessioner employee housing area, portions of the Yosemite Lodge complex, Ahwahnee Row Housing, and various additional administrative and visitor facilities. This would present a local, long-term, minor, adverse impact on floodplains.

**Curry Village & Campground.** Under Alternative 1, the 400 existing lodging units in Curry Village would remain. These units contribute minimally to impervious surfaces within the area, where impervious surfaces prevent the natural infiltration of stormwater into the subsurface, resulting in elevated stormwater flows during storm events, as well as reduced hydrologic concentration time. This results in a local, long-term, negligible, adverse impact on hydrology. The existing facilities at Curry Village are located outside of the 100-year floodplain and therefore do not affect flooding in this area.

**Camp 6 and Yosemite Village.** Existing transportation and circulation related infrastructure would remain under Alternative 1, including roads, pedestrian walkways and crossings, intersections, and parking areas. These features contribute to the overall amount of impervious surfaces within these areas. Because impervious surfaces increase stormwater runoff and contribute to greater peak runoff flows, the continued presence of this infrastructure would contribute to a local, long-term, minor,

adverse impact on hydrology. The associated release of sediments, oils, greases, and other transportation and road related pollutants from these areas would continue to have local, long-term, minor, adverse impacts on water quality. Although select roadways and parking lots, particularly in the area of Camp 6, are located within the 100-year floodplain, these facilities generally do not include large buildings or other obstructions that could potentially interfere with flood flows. The Concessioner Garage is, however, located within the existing floodplain, and could potentially interfere with flood flows. Localized grading associated with these structures can contribute negligibly to interference with floodplain function. Therefore, the continued presence of these facilities within the floodplain would result in local, long-term, minor, and adverse impacts.

**Yosemite Lodge and Camp 4.** The existing pedestrian crossing west of the intersection of Northside Drive and Yosemite Lodge Drive would continue to have a local, long-term, negligible to minor, adverse impact on hydrology due to its contribution to the complex's total area of impervious surfaces. Existing facility operations (the crossing of pedestrians) and infrastructure do not noticeably contribute to stormwater quality pollution in the area. The existing facility is located outside of the floodplain, and does not contribute to flooding on site or downstream.

**Segment 2 Impact Summary:** The continued presence of infrastructure in the river channel and concentrated visitation along Segment 2 riverbanks would have local, long-term, minor to moderate, adverse impacts on the river's floodplain. These factors would also contribute to local, long-term, negligible to minor, adverse hydrology and water quality impacts.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** A levee protecting infrastructure along Highway 140; riprap along the river in El Portal; and abandoned infrastructure and imported fill at Cascades Picnic Area, Abbieville, and Trailer Village would remain, slightly affecting natural river processes. This would result in a local, long-term, minor, adverse impact on hydrology.

Greenemeyer sandpit would continue to contain fill material that precludes natural flooding, causing a local, long-term, minor, adverse impact on hydrology.

**Water Quality.** Water quality would continue to remain high in Segments 3 and 4. Components of Alternative 1 (No Action) have the potential to release pollutants to the Merced River in a slightly detectable manner, but would not be expected to have an overall effect the river's water quality.

The off-street and roadside parking areas would continue to be located between the Merced River and Foresta Road, and underneath valley oaks. These areas have the potential to introduce minimal amounts hydrocarbons and sediment to the river, in a slightly detectable manner, resulting in a localized long-term, negligible, adverse local, impact on water quality.

A bulk storage facility for petroleum fuels and a gas station would continue to be located in El Portal, and the transportation of fuels would continue in the Merced River corridor. The risk of a fuel release would remain, but would be mitigated by compliance with standard regulatory requirements for the

transportation and storage of such materials and normal park operation and maintenance procedure, resulting in a local, long-term, negligible, adverse impact on water quality.

**Segments 3 & 4 Impact Summary:** The continued presence of infrastructure within Segments 3 & 4 would have a local, long-term, minor, adverse impact on hydrology. Continued use of these facilities, namely vehicle use on roads and parking areas, would contribute to local, long-term, negligible, adverse water quality impacts.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Under Alternative 1 (No Action), the impoundment at Wawona would be retained, slightly affecting river processes, and would result in a local, long-term, minor, adverse impact on hydrology.

Surface water withdrawals from the South Fork Merced River in Wawona would continue and would continue to be managed by the *Wawona Water Conservation Plan*. Flows in the South Fork Merced River would not be affected to a detectable level, though a potential for adverse impacts could occur at very low flows associated with droughts (Holmquist and Waddle 2011). This would present a local, short-term, minor, adverse impact on hydrology.

Abandoned metal pipe in side channels on the South Fork Merced River would remain, dewatering the floodplain terrace, and would continue to cause a local, long-term, minor, adverse impact on hydrology.

The Wawona Store Picnic Area near Pioneer History Center would continue to experience visitor use levels during peak periods that exceed the design of the existing infrastructure. There would be no formal river access point there, resulting in the potential for streambank erosion from trampling. This would present a local, short-term, minor, adverse impact on hydrology.

**Water Quality.** Water quality would continue to remain high in Segments 5, 6, 7, and 8. Components of Alternative 1 have the potential to release pollutants to the South Fork Merced River in a slightly detectable manner, but would not be expected to have an overall effect on the river's water quality.

Wawona Campground would continue to be served by septic tanks and leach fields. The septic systems at Wawona Campground, which serve six restrooms, have exceeded their design life by several years, and are not part of the Wawona sewer collection system. Heavy use of the restrooms, combined with high groundwater at the campgrounds can stress the septic system and leach field, creating potential water quality impacts during peak use or wet weather. One leach field has failed and cannot be repaired in its current location and configuration. When the capacity is exceeded, or if other system failures occur or existing failures are not repaired, there would be potential for effluent to migrate into groundwater and the river. This would result in a local, short-term to long-term, moderate, adverse impact on water quality.



River access and picnicking at the Wawona Store Picnic Area, near Pioneer Yosemite History Center would continue to receive visitor use levels during peak periods that exceed the design of the existing infrastructure. There would be no formal river access point here on this steep riverbank. This would result in a local, long-term, negligible, adverse impact on water quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Wawona.** The Wawona campground contains 97 campsites, including 96 individual sites and one group site. The existing campground is located in close proximity to the river, and exists within the 100-year floodplain. The close proximity of the campground to the river promotes trampling of riparian vegetation and results in riverbank erosion. With continued operation of the campground at capacity, these activities will continue to have local, long-term, minor, adverse impacts on water quality due to erosion, and local, long-term, negligible, adverse impacts on floodplains due to the nominal potential for interference of existing facilities with flood flows.

**Segments 5-8 Impact Summary:** The continued presence of infrastructure within Segments 6 and 7 would have a local, long-term, negligible to minor, adverse impact on the river's hydrology, water quality, and flooding.

### **Summary of Alternative 1 (No Action) Impacts**

Development and visitor use in the Merced River corridor have affected hydrologic processes, floodplains, and water quality. Under Alternative 1 (No Action), existing facilities and actions within the river corridor would continue to have short-term and long-term, minor, adverse impacts on water quality; long-term, minor to major impacts on hydrologic processes; and short-term and long-term, minor to moderate impacts on floodplains. Impacts are identified as either localized or segmentwide, while no impacts are identified as parkwide. Impacts would be most pronounced in areas with concentrated facilities and visitor use (e.g., Yosemite Valley, El Portal, Wawona). NPS administrative requirements do afford some protection to the river from future actions (e.g. ongoing water quality monitoring), but no comprehensive or unified plan exists to protect the hydrology, floodplains, and water quality of the Merced River. Under Alternative 1, the presence and continued maintenance of structures such as bridges and facilities within the floodplain, and concentrated visitor use on riverbanks would contribute to local, long-term, minor to moderate, adverse impacts on hydrology, floodplains, and water quality.

### **Cumulative Impacts of Alternative 1 (No Action)**

The discussion of cumulative impacts on hydrology, water quality, and floodplains is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region, in combination with the potential effects of Alternative 1 (No Action). The projects identified below include those projects that have the potential to affect the watershed of the Merced River.

### ***Past Actions***

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include the following: restored hydrological conditions from removal or repair of structures and restored natural drainage features; and benefits to the watershed from management plans that limit or end consumptive uses, such as grazing, formalized camping, and launch facilities for nonmotorized watercraft, and that concentrate visitor impacts. Specific examples of past projects include the following:

- ***Restored Hydrological Conditions:*** Cascades Housing Removal (including associated restoration work), Cascades Diversion Dam Removal, Cook's Meadow Ecological Restoration Happy Isles Dam Removal, Happy Isles Fen Habitat Restoration Project, Happy Isles Gauging Station Bridge Removal, and Merced River Ecological Restoration at Eagle Creek Project.
- ***Management and Planning:*** *South Fork and Merced Wild and Scenic River Implementation Plan* (BLM and USFS 1991)

Adverse impacts from past actions include: modifications to hydrological conditions from the introduction of obstructions in the Merced River channel (e.g., bridges); deterioration of water quality (streambank erosion, nonpoint-source pollution); and changes to natural drainage patterns (soil compaction, loss of vegetation) from facility development. In addition, the development and improvement of roadways affects the water quality immediately adjacent to the roadway during construction; however, these projects include measures to reduce the overall, short-term impacts through the implementation of a compliance monitoring program, avoidance of sensitive habitats, erosion and sediment control measures, hazardous materials controls, and revegetation and reclamation. Specific examples of past projects include the following:

- ***Modified Hydrological Conditions:*** Previous development of bridges, riprap, dikes, flood walls, impoundments, and facilities in the Merced River channel or floodplain; widespread removal of large wood from the river channel from early park management until the 1990s
- ***Rehabilitation of Roadways:*** El Portal Road Improvement Projects, Yosemite Valley Loop Road Rehabilitation, Wawona Road Rehabilitation Project
- ***Facility Development:*** Curry Village development, Yosemite Valley Lost Arrow Temporary Employee Housing and Yosemite Valley Ahwahnee Temporary Employee Housing

### ***Present Actions***

Present actions contribute to similar beneficial and adverse impacts, as described for past actions, above.

Beneficial impacts from present actions are similar to those discussed for past actions. Specific examples of present projects include the following:

- ***Restored Hydrological Conditions:*** General Ecological Restoration

- **Management and Planning:** Grazing restrictions contained in Commercial Use Authorizations for commercial pack stock operators, *Vegetation Management Plan*

Adverse impacts from present actions are similar to those discussed for past actions. Specific examples of present projects include the following:

- **Facility Development:** *East Yosemite Valley Utilities Improvement Plan/EA*, Wahhoga Indian Cultural Center
- **Large Wood Management:** Removal of large wood and debris from the channel in Segment 2

### ***Reasonably Foreseeable Future Actions***

Impacts from future actions are similar to those discussed for past and present actions. A specific example of a future project with beneficial impacts is the forthcoming *Yosemite Wilderness Stewardship Plan/EIS*, while the Concessioner Parking Lot Restoration Project could result in adverse impacts similar to past and present roadway rehabilitation projects

### ***Overall Cumulative Impact***

Overall development and recreational uses within the Merced River watershed have resulted in local, long-term, moderate, adverse impacts on natural hydrology, water quality, and floodplains throughout the Yosemite region. A number of past, present, and future projects have benefited the river through planning or restored hydrological conditions, though the overall impact remains adverse. Under Alternative 1 (No Action), the presence and continued maintenance of structures such as bridges and facilities within the floodplain, and concentrated visitor use on riverbanks, would contribute to local, long-term, moderate, adverse impacts on hydrologic values, floodplains, and water quality. In a cumulative context in conjunction with other actions in the Yosemite region, the impact on hydrologic processes would be long-term, minor, and adverse.

## ***Environmental Consequences of Actions Common to Alternatives 2–6***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Under Alternatives 2–6, restoration activities would cause local, long-term, minor to moderate, beneficial impacts on hydrology. Abandoned infrastructure, such as underground pipelines, wastewater treatment facilities, and manholes that affect hydrology would be removed. (These facilities contribute to dewatering of meadows and alteration in the natural hydrologic regime of the river, increasing the amount and altering the timing of runoff entering the Merced River.) Removing infrastructure that affects hydrology would have a local, long-term, minor, beneficial impact on hydrology.

Six miles of informal trailing on meadows and near archeological sites, including at El Capitan, Cooks, and Sentinel Meadows, would be removed and restored to natural conditions. Areas that have been

denuded of vegetation due to trampling would be decompacted and replanted with native species. Fencing and signage would be used near the El Capitan and Swinging Bridges to direct traffic to less sensitive areas that can accommodate some use without compromising meadow and riparian ecosystem health. Restored trail areas with compacted soils would be decompacted; soils and ruts would be filled with native soils. Conifer seedlings and saplings would be removed from Royal Arches, Ahwahnee, and other valley meadows and low-intensity, high-frequency fire would be restored as an ecological process. The riparian zone would be protected from new development within 150 feet from the ordinary high-water mark. These actions would restore the ability of soils to infiltrate runoff and promote a more natural hydrologic regime. These actions would have a corridor-wide, long-term, moderate, beneficial impact on hydrology.

The riparian zone would be protected from new development within 150 feet of the ordinary high-water mark, and all campsites would be relocated at least 100 feet away from the ordinary high-water mark. Areas susceptible to erosion, such as steep riverbanks and areas of trampled or denuded vegetation, would be closed and restored using bioengineering and revegetation. Large wood, engineered log jams, and brush layering would be used in the vicinity of bridges to decrease bed scouring and streambank instability. Riprap would be removed where possible and replaced with native riparian vegetation, using bioengineering techniques. Large wood and constructed log jams can deflect erosive flows away from bridge abutments and other structures, and also promote desirable sediment deposition. Use of constructed logjams could, however, require ongoing maintenance by the NPS in order to maintain their efficacy, such as following major storm events which could result in logjam washout or alteration. In the event that such actions do not improve conditions, bridge redesign or removal could be reconsidered. These actions would increase the integrity of hydrologic processes and would have a corridor-wide, long-term, moderate, beneficial impact on hydrology.

Constructed logjams would be installed in the river and large wood would be managed according to a large wood management plan. Large wood that does not compromise visitor safety or infrastructure would be allowed to remain in the Merced River. Large wood would be incorporated into riverbanks to provide structure for eroded riverbanks. In developed areas, where hazard trees must be removed for safety, they would be felled into the river rather than cut and removed. Constructed logjams would be installed into the river in severely widened reaches, improving hydrologic function. An increase in the wood load of the river would promote more complex morphology of the Merced River and reduce river widening. These actions would have a corridor-wide, long-term, moderate, beneficial impact on hydrology.

Under Alternatives 2–6, 3,400 feet of riprap would be removed and revegetated with riparian species as needed. An additional 2,300 feet of riprap would be removed and replaced with bioengineered riverbank stabilization. Riprap hardens riverbanks preventing channel erosion and other natural stream processes such as lateral migration and point bar formation. Riprap also reduces flow velocity dissipation that would be provided by riparian vegetation, thereby impacting areas downstream. Removal of riprap and replacing it with natural vegetation or biostabilization would partially restore hydrologic processes in a detectable manner, and would have corridorwide, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternatives 2–6, restoration actions, including those described above for Hydrology, would cause corridor-wide long-term, minor, beneficial impacts and corridor-wide, short-term, minor, adverse impacts on water quality. Restoration of meadows in the areas of informal trails and revegetation of floodplains and streambanks would reduce the amount of erosion and fine sediment entering the stream. Visitor use would be limited in unstable areas and directed to more resilient access points; constructed logjams would be installed to protect erosive areas; and riprap would be removed and replaced with native riparian vegetation, using bioengineering techniques. These actions would have corridor-wide, beneficial, long-term, minor impacts on water quality.

Restoring low-intensity, high-frequency fire to the Merced River corridor would temporarily remove vegetation that stabilizes fine sediment and prevents erosion. This would have the potential to increase the generation of fine sediment that enters the river over the short term, until vegetation can regenerate to restabilize soils. Such effects would be limited, however, during most prescribed burning, because most prescribed fires would be small and generally located on flat terrain. This action would have a local, short-term, minor, adverse impact on water quality.

Eroded riverbanks would be stabilized using bioengineering techniques, such as brush layering of willow cuttings. Visitor use would be directed away from vulnerable riverbanks and to more resilient access points, such as sandy beaches and low-angle slopes, through delineated trails, signs, maps, and brochures. Signage and fencing would be established to protect vulnerable riverbanks. These actions would reduce instability of riverbanks and reduce erosion and the amount of fine sediment entering the Merced River. These actions would have a corridor-wide, long-term, moderate, beneficial impact on water quality.

The riparian zone would be protected from new development within 150 feet of the ordinary high-water mark, and all campsites would be relocated at least 100 feet away from the ordinary high-water mark. Areas susceptible to erosion, such as steep riverbanks and areas of trampled or denuded vegetation, would be closed and restored using bioengineering and revegetation techniques. Large wood, constructed logjams, and brush layering would be used in the vicinity of bridges to decrease bed scouring and streambank instability. Large wood and constructed logjams can deflect erosive flows away from bridge abutments and promote sediment deposition near bridges. Riprap would be removed where possible and replaced with native riparian vegetation, using bioengineering techniques. These actions would promote local streambank stability, which would reduce the amount of fine sediment entering the river, leading to a corridor-wide, long-term, minor, beneficial impact on water quality.

Constructed logjams would be installed in the Merced River and large wood would be managed according to a large wood management plan. Large wood that does not compromise visitor safety or infrastructure would be allowed to remain in the river. Large wood would be incorporated into riverbanks to provide structure for eroded riverbanks. In developed areas where hazard trees must be removed for safety, they would be felled into the river rather than cut and removed. Constructed logjams would be installed into the river in severely widened reaches, improving hydrologic function. Use of constructed logjams could, however, require ongoing maintenance by the NPS in order to maintain their efficacy, such as following major storm events which could result in logjam washout or alteration. In the event that such actions do not improve conditions, bridge redesign or removal could

be reconsidered. Constructed logjams would decrease channel widening and increase channel resistance to erosion, leading to a corridor-wide, long-term, minor, beneficial impact on water quality.

**Floodplains.** Under Alternatives 2–6, restoration activities, including those described above for Hydrology, would cause corridor-wide, long-term, minor to moderate, beneficial impacts on floodplains. The riparian zone would be protected from new development within 150 feet from the ordinary high-water mark. This action would reconnect the river to its floodplain in some areas where it has been affected by development. These actions would have a corridor-wide, long-term, beneficial, moderate impact on floodplains.

Constructed logjams would be installed in the Merced River and large wood would be managed according to a large wood management plan. Large wood that does not compromise visitor safety or infrastructure would be allowed to remain in the river. Large wood would be incorporated into riverbanks to provide structure for eroded riverbanks. In developed areas, where hazard trees must be removed for safety, they would be felled into the Merced River instead of cut and removed. Constructed logjams would be installed into the river in severely widened reaches, improving hydrologic function. An increase in the wood load of the river would promote more complex morphology and increase shallow overbank flooding. These actions would have a corridor-wide, long-term, minor, beneficial impact on high-frequency floodplains. An increase in the wood regime and installation of constructed logjams would slightly increase the roughness of the river, thereby increasing water surface elevations during low-frequency events such as the 100-year storm event, though not in a manner that is expected to be detectable. This would result in a corridor-wide, long-term, negligible, beneficial impact on floodplains.

**Hydrologic/Geologic Resource Actions.** Under Alternatives 2–6, 3,400 feet of riprap would be removed and revegetated with riparian species, as needed. An additional 2,300 feet of riprap would be removed and replaced with bioengineered riverbank stabilization. Riprap hardens riverbanks, preventing channel erosion, but can accelerate channel velocity and result in downstream impacts. Removing riprap and replacing it with natural vegetation or biostabilization would lead to more stable banks. Riprap would be removed using a track-mounted excavator. Operators would pick up boulders with the bucket of the excavator and either stockpile the rocks on adjacent terraces or load them directly into a dump truck. Bioengineering techniques would include hydrodrilling, brush layering, and wood incorporation. Willow wattles and anchoring logs could be used to accrete sediment. Willow cuttings would be taken from established plants and placed deeply into the soil to promote regeneration and prevent them from washing away during high-water events. Rocky or compacted riverbanks would most effectively and efficiently be planted using a hydraulic excavator. In fine sediment, a hydro-drill (a pump with a high-powered stream of water) would create deep holes into which cuttings would be placed. Willows could also be bundled into wattles and partially buried and anchored along riverbanks. Large wood could also be used to provide structure when repairing highly eroded riverbanks or after riprap removal. Earth-moving activities during construction have the potential to mobilize fine sediment, which would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce this impact to negligible. After construction, this action would improve water quality in a detectable manner by reducing incidence of erosion and bank failure, and would have a segmentwide, long-term, minor, beneficial impact on water quality.

## **Segment 1: Merced River Above Nevada Fall**

### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** In Segment 1, informal trails in Merced Lake Shore Meadow, adjacent the Merced Lake High Sierra Camp have fragmented meadow habitat and stunted vegetation lining the lakeshore. Compacted soils are less able to infiltrate runoff than noncompacted soils, altering the hydrologic regime. Under Alternatives 2–6, informal trails would be removed, soils would be decompacted, and ruts would be filled with native soils. Denuded areas would be planted with native species. These actions would promote infiltration of runoff and would result in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Pack stock used for administrative purposes would no longer graze on meadow vegetation near the Merced Lake Ranger Station. This would help protect meadow vegetation, which in turn would help to stabilize soils in the area. This would result in a local, long-term, negligible, beneficial impact on water quality.

In Segment 1, informal trails in the meadow adjacent the Merced Lake High Sierra Camp, have the potential to increase fine sediment delivery. Compacted soils are less able to infiltrate runoff than noncompacted soils, altering the hydrologic regime and increasing the intensity of runoff. In addition denuded areas have less vegetation to stabilize sediments, increasing the potential for erosion from informal trails. Under Alternatives 2–6, informal trails would be removed, soils would be decompacted, and ruts would be filled with native soils. Denuded areas would be planted with native species. These actions would reduce the intensity of runoff and reduce fine sediment delivery to the Merced River. This would result in a local, long-term, minor, beneficial impact on water quality.

**Segment 1 Impact Summary:** Actions to protect and enhance river values would have a local, long-term, negligible to minor, beneficial hydrology and water quality impacts.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** In Segment 2, roads over meadows and paved bicycle paths have disconnected the floodplain from the Merced River, creating a negligible impediment to the free-flowing condition of the river during high flows. Large portions of the floodplain become disconnected from the river, disrupting the ecological function of the meadows. Under Alternatives 2–6, road and bicycle path improvements over meadows would use wide box culverts or other design components such as rolling dips, permeable subgrade, etc., to improve water flow. This would have a segment-wide, long-term, negligible, beneficial impact on hydrology.

Under Alternatives 2–6, large wood, constructed logjams, and brush layering would be used from El Capitan Moraine to the Sentinel Picnic Area, and in the vicinity of Clark's Bridge, Housekeeping Camp footbridge, Happy Isles Bridge, Sentinel Bridge, and Swinging Bridge to decrease bed scouring and streambank instability in the vicinity of these bridges. At Housekeeping Camp Bridge, the channel downstream has widened beyond its historic width, contributing to streambank failure. Large wood



and constructed logjams can enhance channel complexity and deflect erosive flows away from bridge abutments and promote sediment deposition near bridges. Use of constructed logjams could, however, require ongoing maintenance by the NPS in order to maintain their efficacy, such as following major storm events which could result in logjam washout or alteration. In the event that such actions do not improve conditions, bridge redesign or removal could be reconsidered. These actions would promote local streambank stability, leading to a local, long-term, minor, beneficial impact on the free-flowing nature of the Merced River.

Under Alternatives 2–6, restoration activities in meadow areas would result in minor to negligible, beneficial impacts on the free-flowing nature and hydrology of the Merced River. Informal trails in the vicinity of Leidig Meadow and Sentinel Meadow have fragmented meadows and compacted soils. Soil compaction reduces the infiltration rate and affects river hydrology. Meadow disconnection creates a negligible impact on the free-flowing nature of the river. Under Alternatives 2–6, informal trails in these areas would be removed, decompacted, and restored to native meadow vegetation. This would result in a local, long-term, minor, beneficial impact on hydrology due to restoration of soil infiltration and a local, long-term, negligible, beneficial impact on the free-flowing nature of the river by reconnecting meadow areas.

Abandoned roadbeds exist adjacent to Ahwahnee Meadow, Bridalveil Meadow, in the vicinity Cook's Meadow, and near Royal Arches Meadow, causing a disconnection of meadow areas and a reduction of the infiltration capacity of the soil. Under Alternatives 2–6, former roadbeds in these areas would be removed, and the soils decompacted and replanted with native species, resulting in a local, long-term, beneficial, negligible impact on the free-flowing nature of the Merced River and a local, long-term, minor, beneficial impact on hydrology.

Abandoned underground tiles and pipes exist adjacent to Bridalveil Meadow, Eagle Creek Meadow, near the former Rocky Point Sewage Plant, and Royal Arches Meadow. These tiles and pipes contribute to dewatering of meadows and affect the natural hydrologic regime of the river, increasing the amount and timing of runoff entering the river. Under Alternatives 2–6, abandoned underground infrastructure would be removed, resulting in a segment-wide, long-term, minor, beneficial impact on hydrology.

Adjacent to Bridalveil Meadow, a deep headcut in the meadow from a former ditch is causing meadow dewatering and downstream erosion. Willows were once removed from the meadow and have not been present for over 100 years, potentially increasing the rate of erosion around the headcut. Under Alternatives 2–6, this area would be treated by inserting live willow cuttings into the headcut area, the riverbank, and the adjacent meadow, thereby stabilizing the area and arresting future erosion. This would prevent dewatering of the meadow, resulting in a local, long-term, minor, beneficial impact on hydrology.

At Ahwahnee Meadow, several topographic modifications and impervious areas affect the hydrologic function of the meadow, including ditching, fill material at the former golf course, and the tennis courts. Under Alternatives 2–6, the Ahwahnee Meadow would be restored by removing tennis courts, restoring topography, removing abandoned irrigation lines and fill, filling ditches, and revegetating with native meadow vegetation. This would restore the hydrologic regime of 5.65 acres of meadow, resulting in a local, long-term, minor, beneficial impact on hydrology.

Informal shoulder parking is encroaching on Cook's Meadow at Sentinel Drive and Northside Drive. The footprint of this area is estimated to be up to 25 feet, reducing the meadow extent and causing a minor impact on the hydrologic regime by destroying native vegetation and compacting soils, which leads to less infiltration of runoff. Under Alternatives 2–6, roadside parking along Cook's Meadow would be removed and the area would be restored to meadow conditions, creating a local, long-term, minor, beneficial impact on hydrology.

The western portion of Lower Pines Campground and the former Yosemite Lodge cabin area and volunteer center were affected by the 1997 flood and subsequently abandoned. Remaining areas of roadbeds, fill, and compacted soils are still present, causing a reduction of the infiltration capacity of the soil. Under Alternatives 2–6, 20 acres of floodplain adjacent to Lower Pines Campground, as well as 13.2 acres of riparian area near the former Yosemite Lodge cabin area and volunteer center, would be restored and decompacted, resulting in a local, long-term, minor, beneficial impact on hydrology.

Restoration actions in Eagle Creek would restore its natural braided morphology. Channelization of the creek affects the natural hydrology of the Merced River by altering the timing and velocity of runoff. Under Alternatives 2–6, the berm and parking lot abutting Eagle Creek would be removed and culverts would be added to allow more dispersed water delivery to Eagle Creek Meadow and the Merced River. The restored areas would be revegetated with native upland species, resulting in a local, long-term, minor, beneficial impact on hydrology.

High visitor use along sensitive riverbanks near El Capitan Bridge; Swinging Bridge Designated Picnic Area; Sentinel Beach Designated Picnic Area, between Happy Isles and the Mist Trail; Devil's Elbow; and in Yosemite Valley campgrounds is causing vegetation trampling and soil compaction, resulting in riparian vegetation loss, riverbank erosion, and decreased soil infiltration. Under Alternatives 2–6, visitors would be redirected to access the river at resilient sandbar points through signage, campground maps, and brochures. Picnic areas would be delineated by fencing, and river terraces would be revegetated with native species. Vulnerable steep slopes would be fenced off to prevent further bank erosion. These actions would result in a local, long-term, minor, beneficial impact on hydrology by restoring native soil infiltration and runoff characteristics.

Cultural restoration activities would result in local, long-term, minor, beneficial impacts on hydrology. Informal trails near archeological sites would be removed and restored, resulting in restored vegetation and decompacted soils, which in turn would restore the hydrologic regime to natural conditions. This would result in a local, long-term, minor, beneficial impact on hydrology.

Overflow day parking has developed along the road shoulder of Sentinel Drive, resulting in vegetation being trampled and destroyed. Under Alternatives 2–6, roadside parking along Sentinel Drive would be removed and restored to natural conditions. This would restore the hydrologic regime in this area, resulting in a local, long-term, minor, beneficial impact on hydrology.

Unnecessary infrastructure at the former Happy Isles footbridge (including old Happy Isles Bridge Abutments and the abandoned gaging station base) that restrict the free-flowing nature of the Merced River would be removed under Alternatives 2–6. The Pohono Bridge gaging station, which is currently located within the bed and banks of the Merced River, would be relocated north of Northside Drive, out of the river channel, and connected to the river via conduits under the road. Footings and other

structures would be removed from the bed and banks of the river, and denuded vegetation would be restored, resulting in a local, long-term, minor, beneficial impact on the free-flowing nature of the river.

Under Alternatives 2–6, parking and traffic circulation at the Ahwahnee and Wilderness-related parking areas (i.e., hotel parking and also formal parking areas for access to wilderness areas) would be rehabilitated to include proper drainage and stormwater best management practices. Drainage improvements would include swales, bioretention areas, or infiltration areas, which would reduce stormwater peak flows and reduce the velocity of runoff entering the Merced River. These would have a beneficial, minor, long-term effect on hydrology.

The western portion of Lower Pines Campground was affected by the 1997 flood and most infrastructure was subsequently removed. Remaining areas of roadbeds, fill, and compacted soils are still present, causing a reduction of the infiltration capacity of the soil, and precludes riparian vegetation growth. Under Alternatives 2–6, 20 acres of floodplain adjacent to Lower Pines Campground, as well as 13.2 acres of riparian area near the former Yosemite Lodge cabin area and volunteer center, would be restored and decompacted, resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternatives 2–6, restoration activities in meadow areas would result in local, long-term, minor, beneficial impacts on water quality. Methods for meadow and riparian restoration would include asphalt removal, recontouring, ditch removal, and decompaction. Asphalt surfaces would be broken using heavy equipment. Asphalt would then be loaded into dump trucks, using a loader to be moved off-site. Small asphalt pieces may be manually collected and removed. Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer may be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer may push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil, as decompaction occurs, using an excavator or a dozer with winged rippers. Earth-moving activities during construction have the potential to mobilize fine sediment, which would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce this impact to negligible.

Informal trails in the vicinity of Leidig Meadow and Sentinel Meadow have denuded vegetation, which can contribute to fine sediment entering runoff. Under Alternatives 2–6, informal trails in these areas would be removed, decompacted, and restored to native meadow vegetation. This would result in a local, long-term, minor, beneficial impact on water quality due to reducing the amount of fine sediment entering the Merced River.

The area located adjacent to Bridalveil Meadow would be treated by inserting live willow cuttings into the headcut area, the riverbank, and the adjacent meadow, thereby stabilizing the area and arresting

future erosion. This would result in a local, long-term, minor, beneficial impact on water quality due to reducing the amount of fine sediment entering the Merced River.

Informal shoulder parking is encroaching on Cook's Meadow at Sentinel Drive and Northside Drive. The footprint of this area is estimated to be up to 25 feet, reducing the meadow extent and causing a minor impact on water quality by removing vegetation that can stabilize soils, which leads to an increased chance of fine sediment being mobilized in stormwater. Under Alternatives 2–6, roadside parking along Cook's Meadow would be removed and the area would be restored to meadow conditions, creating a local, long-term, minor, beneficial impact on water quality by reducing the amount of fine sediment entering the Merced River.

The western portion of Lower Pines Campground and the former Yosemite Lodge cabin area and volunteer center were affected by the 1997 flood and subsequently removed. Remaining areas of roadbeds, fill, and compacted soils are still present, causing a potential source of fine sediment. Under Alternatives 2–6, 20 acres of floodplain adjacent to Lower Pines Campground, as well as 13.2 acres of riparian area near the former Yosemite Lodge cabin area and volunteer center, would be restored resulting in a local, long-term, minor, beneficial impact on water quality.

Restoration actions in Eagle Creek would restore its natural braided morphology. Channelization of the creek affects the natural hydrology of the Merced River by altering the timing and velocity of runoff, thus increasing the potential for erosion. Under Alternatives 2–6, the berm and parking lot abutting Eagle Creek would be removed and culverts would be added to allow more dispersed water delivery to Eagle Creek Meadow and the Merced River. The restored areas would be revegetated with native upland species, thereby reducing erosion and resulting in a local, long-term, minor, beneficial impact on water quality.

High visitor use along sensitive riverbanks near El Capitan Bridge; Swinging Bridge Designated Picnic Area; Sentinel Beach Designated Picnic Area, between Happy Isles and the Mist Trail; Devil's Elbow; and in Valley campgrounds is causing vegetation trampling, resulting in riparian vegetation loss, river bank erosion, and a potential for erosion of fine sediment. Under Alternatives 2–6, visitors would be redirected to accessing the Merced River to resilient sandbar points through signage, campground maps, and brochures. Picnic areas would be delineated by fencing, and river terraces would be revegetated with native species. Vulnerable steep slopes would be fenced off to prevent further bank erosion. These actions would result in a segment-wide, long-term, minor beneficial impact on water quality by reducing the potential for erosion.

Informal trails near archeological sites contribute to vegetation denudation and can contribute to erosion and fine sediment entering the river. Informal trails near archeological sites would be removed and restored, resulting in restored vegetation and a reduction in fine sediment entering the river, resulting in a local, long-term, minor, beneficial impact on water quality.

**Biological Resource Actions.** Biological resources actions common to Alternatives 2–6 and located in Segment 2 include restoration of 5.65 acres of Ahwahnee Meadow to natural conditions; installation of 150 feet of boardwalk at Sentinel Meadow; restoration and removal of non-native species and encroaching conifers at Stoneman Meadow; formalization of parking and river access areas from Pohono Bridge to Diversion Dam, including soil decompaction and riparian revegetation; removal of

all campsites within 100 feet of the bed and banks of the river, including removal of asphalt parking, decompacting of soils, revegetation and recontouring; rerouting of trails, removal of informal trails, replacement of culverts, and installation of new culverts at El Capitan Meadow; relocation of parking and removal of informal trails at Devil's Elbow; restore riverbank with brush layering and restrict visitor access at Housekeeping Camp riparian and river access areas; designate river access points, reestablish riparian vegetation, remove parking from the riparian zone, decompact soils, remove infrastructure (toilets, parking, picnic tables) from the 10-year floodplain at Cathedral Beach Picnic Area; fill 2,155 feet of ditches not serving current operational needs along Valley meadows.

Restoration of meadows and other areas located outside of the floodplain could contribute to increased stormwater infiltration capacity and increased storm event hydrologic concentration times. Decompaction of soils and restoration of riparian vegetation would have similar effects. Restoration of riparian vegetation would generally slow floodwaters in the vicinity of the restored area, more closely mimicking natural conditions, resulting in a segment-wide, long-term, negligible, beneficial impact to hydrology.

Removal of all campsites, existing infrastructure, and other facilities as discussed above from within 100 feet of the river bed and banks would reduce existing constraints on the natural floodplain of the river. Reductions in these constraints would support the free-flowing condition of the river, and would reduce existing interference within the floodplain. Therefore, this is considered a segment-wide, long-term, minor, beneficial impact with respect to flooding.

Extending the permeable road base across the entire segment of Northside Drive through El Capitan Meadow and adding more box culverts beneath Northside Drive, with bottom elevations equal to the meadow surface elevation, would support drainage at El Capitan Meadow. Installation of culverts would alleviate or reduce localized flooding during storm events, which is considered a local, long-term, minor, beneficial impact to flooding.

Construction of the proposed biological resources actions could result in temporary disturbance to surface sediments and vegetation. Disturbance would result primarily from the use of heavy machinery. Heavy machinery would be used for soil decompaction, removal and relocation of asphalt parking lots including those located within 150 feet of the bed and banks of the river, recontouring of topography, rerouting of trails, removal of informal trails, replacement or installation of culverts, removal of infrastructure from the 10-year floodplain, and removal of fill as noted previously. Minimal additional disturbance could occur during restoration activities and installation of the 150 foot boardwalk, due to localized disturbance. Additionally, construction related use of heavy machinery could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants, during the construction process. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant

levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

**Hydrologic/Geologic Resource Actions.** Hydrologic resources actions common to Alternatives 2-6 and Segment 2 include removal of abandoned gauging station infrastructure located at Pohono Bridge, and restoration of the riparian buffer to natural conditions; removal of the Happy Isles former footbridge remnant footings, along with the river gauge base, and revegetate denuded informal trails; comprehensive restoration within the river reach between Clark’s and Sentinel bridges, construction of eight engineered log jams plus revegetation to repair localized erosion.

With respect to hydrology, the existing structures located along the Merced River, including abandoned gauging infrastructure at Pohono Bridge and at the Happy Isles former footbridge, and remnant footings for the Happy Isles former footbridge, contribute to altered hydrology along the river by restricting the free-flowing condition of the river. Removal of these structures would alleviate the hydrologic restrictions, resulting in a local, long-term, negligible, beneficial impact on hydrology

Between Clark’s and Sentinel Bridges, the river is more than twice its historic width, shallower than its historic depth, and lacks complexity. Installation of the eight proposed constructed logjams is expected to reduce the intensity and extent of this condition, by adding complexity to the river channel and reducing existing channel width. Potential uncertainty regarding the long-term efficacy of the proposed logjams is noted, which could potentially be subject to washout or other hydrologic processes. However, considering the anticipated reduction of channel width to a more natural state, this action would result in a local, long-term, moderate, beneficial impact on hydrology.

With respect to flooding, removal of the remnant infrastructure, as noted above, would reduce existing obstructions to the free-flowing condition of the river. Revegetation of informal trails and riparian areas would result in increased complexity and roughness within the river floodplain, and installation of the proposed constructed logjams would also result in increased roughness and complexity within the system. The anticipated increased roughness would contribute to a slowing of floodwaters during a flood event, but any changes in flood height or extent are expected to be non-detectable. Therefore, these actions would result in a local, long-term, negligible, beneficial impact with respect to flooding.

During construction for each of the proposed resource actions noted above, potential water quality degradation could occur as a result of the proposed activities involving facility removal and installation. Specifically, removal of abandoned gauging station infrastructure, removal of remnant footings, construction and installation of log jams, and restoration activities could require the use of heavy construction equipment. Equipment used may include excavators, backhoes, bulldozers, semi-trucks, and other construction equipment. Use of such machinery during construction could result in disturbance to surface sediments and soils, and temporary disturbance to existing vegetation. As a result, increased sediment loading could occur during storm events, which could result affect natural waters in the Merced River. Additionally, use of heavy machinery could result in the accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants. These potential impacts would be limited to the construction period. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential water quality impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage could result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

**Cultural Resource Actions.** Cultural resource actions in Segment 2 common to Alternatives 2-6 would include the removal of campsite 208 from the Upper Pines campground, including the existing bear box, and footpath to restroom facilities. Under existing conditions, the campsite is located in close proximity to pounding rocks/bedrock mortars, which are being degraded due to campground use. Removal of this campsite would not remove or add any impervious surfaces, would not remove or create any major structures that could impede flood flows, and would not result construction of facilities or other actions that could result in a detectable change in stormwater quality. For these reasons, no detectable impacts, adverse or beneficial, on hydrologic resources would occur.

**Scenic Resource Actions.** A suite of scenic resource actions would occur within Segment 2 under Alternatives 2-6. Briefly, these would include at several locations within Segment 2: removal and selective thinning of encroaching conifers and other vegetation; and monitoring and maintenance of distant views; restoration of grassland and oak habitat. Specific actions relevant to hydrology and water quality include burning of undergrowth in the vicinity of Sentinel Bridge; repair of riverbank erosion at Clark's Bridge.

Riverbank erosion at Clark's Bridge contributes to impacted hydrologic processes along the Merced River. Repair of existing riverbank erosion in this area would alleviate the existing impacted condition, resulting in a local, long-term, negligible, and beneficial impact on water quality.

Conifer and other tree/shrub thinning or removal could involve limited use of heavy machinery during the thinning or removal process. Restoration activities could also involve the limited use of heavy machinery. Use of heavy machinery could result in the accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, sediment, and other potential construction related water quality pollutants. These potential impacts would be limited to the construction period, and would be limited in extent due to the limited use of such equipment. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential water quality impacts to local, short-term, negligible, and adverse.

Immediately following selective burning, elevated levels of nutrients, sediment, and other potential water quality pollutants may be present in stormwater inclement on burned areas. Selective burning associated with the proposed scenic resource actions evaluated here would be used in limited areas that would generally not be located immediately adjacent to the Merced River. Therefore, potential impacts of selective burning on water quality are considered local, short-term, negligible, and adverse.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** To educate visitors on natural river processes and protection and stewardship of river-related resources, an interpretive walk through Lower River Campground would be developed. It would emphasize river-related natural processes, the NPS's ecological restoration work, and what



visitors can do to protect the river. Increased visitor awareness of ways to protect the river would lead to protection of streambanks and floodplain areas, resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** The area adjacent to Bridalveil Meadow would be treated, under Alternatives 2-6, by inserting live willow cuttings into the headcut area, the riverbank, and the adjacent meadow, thereby stabilizing the area and arresting future erosion. This would result in a local, long-term, minor, beneficial impact on water quality due to reducing the amount of fine sediment entering the Merced River.

**Camp 6 and Yosemite Village.** Actions common to Alternatives 2-6 proposed for the Yosemite Village area include removal the existing Concessioner General Office with relocation of essential functions to the Concessioner Maintenance and Warehouse building; relocation of the Concessioner Garage to the Government Utility Building, with Camp 6 parking being expanded into the existing garage service area footprint; removal of the pool and tennis courts from The Ahwahnee complex, removal of the Arts and Activities Center (Bank Building) and informal parking overflow from the Camp 6 day use area; repurposing of the Village Sport Shop as a visitor contact station; and construction of a new maintenance building near the Government Utility Building, and of pathways leading from the Camp 6 parking lot to the existing Village Sport Shop building.

Removal of the Concessioner General Office, the Concessioner Garage building, the pool and tennis courts, and the Arts and Activities Center would result in a net reduction in the total area of impervious surfaces within the complex. Impervious surfaces prevent the infiltration of stormwater into the soil, causing increased discharges of stormwater into receiving waters and a shortened hydrologic concentration time, as compared to existing conditions. Additionally, removal of the existing informal parking area near Camp 6 would result in the restoration of soils that have become partially compacted due to vehicle usage. Compacted surfaces reduce stormwater infiltration capacity and, similar to impervious surfaces, result in a net increase in stormwater runoff and a reduction in hydrologic concentration times. Removal of impervious and partially compacted areas within the complex would therefore help to restore natural stormwater infiltration. Construction of the proposed maintenance building and the expansion of Camp 6 parking would partially, but not entirely, offset the reduction in impervious surfaces associated with facility removal. The expanded parking lot would, however, include the installation of bioswales to help manage stormwater and stormwater quality. Repurposing of the existing Sport Shop would not alter existing impervious surfaces or cause other changes that would affect stormwater hydrology. In total, these actions would contribute to an approximately 0.68 acre reduction in existing impervious surfaces, would move select existing infrastructure further from the river, and would support updating of existing drainage infrastructure, and would result of the installation of bioswales at parking lots. Therefore, these proposed actions would cause in a net reduction in total impervious surfaces on site, resulting in a local, long-term, minor, beneficial impact on hydrology.

Demolition of existing facilities slated for removal, as well as construction of the proposed buildings and parking lots discussed above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the

accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The existing Concessioner Garage is located in an area that is subject to inundation during a 100-year flood. The garage is used to service shuttles, tour buses, and visitor and concessioner vehicles. During a major flood event, if the facility were to become inundated, potential automotive related water quality pollutants could be released into flood waters. Inundation is anticipated to occur infrequently. Therefore, removal of the Concessioner Garage from the 100-year floodplain would result in a local, long-term, negligible, beneficial impact on water quality.

The existing informal parking area near Camp 6 is located within the 100-year floodplain. The existing Concessioner Garage is also located in the river corridor, within the 100-year floodplain. The proposed expansion of the Camp 6 parking lot would be located within the 100-year floodplain. Removal and restoration of the existing informal parking areas near Camp 6 would result in negligible changes to existing topography, and would not result in the installation or removal of any structures, berms, or other facilities that could interfere with or alter flood flows. Removal of the existing Concessioner Garage would result in the removal of a building that, under existing conditions, could interfere with flood flows. Replacement of the Concessioner Garage with additional parking area would therefore result in a net reduction in the level of potential flood-flow interference that would result from facilities in this area. Therefore, these actions would have a local, long-term, minor, beneficial floodplain impact.

**Yosemite Lodge and Camp 4.** Actions at Yosemite Lodge and immediately surrounding areas that would occur across Alternatives 2-6 include removal of the NPS Volunteer Office, post office, swimming pool, snack stand, and old and temporary housing at Highland Court; removal and replacement of Yosemite Lodge employee housing (Thousand Cabins) with new facilities; relocation of the Yosemite Lodge maintenance and housekeeping facilities; and re-purposing of the convenience and nature shops.

Removal of the NPS volunteer office, post office, swimming pool, snack stand, and housing would result in a net reduction in the total area of impervious surfaces located within the complex. In total, assuming that relocation of existing facilities would result in no net change in impervious surfaces, approximately 0.45 acres (net) of existing impervious surface area would be removed. Relocation of the existing Yosemite Lodge employee housing and maintenance/housekeeping facilities would change the location, but not the amount of impervious surface area. Repurposing of the existing convenience and nature shops would not result in the addition or removal of impervious surface areas. Therefore, implementation of the actions proposed for the Yosemite Lodge and its vicinity would result in a net reduction in total impervious surface area of 0.45 acres. Because impervious surfaces prevent the infiltration of stormwater and result in elevated peak flows and reduced hydrologic concentration times, a reduction in impervious surface coverage would result in a beneficial effect on hydrology. For these reasons, the proposed actions would result in a local, long-term, minor, beneficial impact on hydrology.

Water quality could be affected by construction of the proposed facilities. Construction activities would involve the demolition and removal of select facilities located on site, as well as construction of new facilities within the previously developed area. Construction activities associated with these actions would require the use of heavy equipment, which could loosen surface soils and sediments, creating increased potential for erosion. Use of heavy construction equipment can also result in the accidental release of oils, greases, antifreeze, hydraulic fluid, and other potential water quality pollutants. Additionally, demolition of the existing facilities could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Therefore, construction activities would result in a local, short-term, minor, adverse impact on water quality. However, implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the impact intensity to negligible.

With respect to flooding, two of the existing Yosemite Lodge employee housing (Thousands Cabins) cabins are located in the 100-year floodplain. However, replacement facilities would be located outside of the existing 100-year floodplain, in areas adjacent to the other Thousands Cabins site. Other proposed facilities in this area would be located outside of the 100-year floodplain. Replacement of existing facilities which are currently located within the 100-year floodplain, with facilities that are located outside of the 100-year floodplain would result in a local, long-term, minor, beneficial impact on floodplains.

**Bridalveil and West Valley:** Actions at Bridalveil/West Valley would include paving and formalization of five roadside pull-outs to support river access, installation of curbing along pull-outs along El Portal Road, removal of one pull-out that is not protective of resources, decompaction of soil and revegetation in areas that require restoration following parking and river access formalization.

Formalization/paving of pull-outs and associated facilities would minimally increase the area of impervious surfaces within this area. Decompaction of soils and revegetation would promote infiltration in restored areas, which would in part offset increased impervious surfaces. This would result in a local, long-term, negligible, adverse impact on hydrology.

Water quality could be affected by construction of the proposed facilities. Construction activities would involve the installation of pavement and the removal of select informal pull-outs. Construction activities associated with these actions would require the use of heavy equipment, which could loosen surface soils and sediments, creating increased potential for erosion. Use of heavy construction equipment can also result in the accidental release of oils, greases, antifreeze, hydraulic fluid, and other potential water quality pollutants. Additionally, demolition of the existing facilities could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Therefore, construction activities would result in a local, short-term, minor, adverse impact on water quality. However, implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the impact intensity to negligible.

With respect to flooding, installation of pavement would not involve the installation of large structures that could impede flood flows. While the proposed extent of the new parking lots would be limited, flood flows over smooth pavement can result in increased flood velocities in comparison to unpaved areas due to reduced roughness. Increased flood velocities can support increased erosion potential

and other deleterious hydrodynamic effects downstream. Therefore, installation of these relatively small facilities would result in a local, long-term, negligible, adverse impact on floodplains.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, long-term, moderate, beneficial, hydrology, water quality, and floodplain impacts. Actions to manage user capacities, land use, and facilities would result in local, long-term, minor, beneficial impacts on hydrology and water quality.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Removal of abandoned infrastructure and imported fill at Cascades Picnic Area, Abbieville, and Trailer Village would restore natural runoff processes in this area, resulting in a local, long-term, negligible, beneficial impact on hydrology.

Under Alternatives 2–6, a set of best management practices would be developed for revetment construction and repair throughout the Merced River corridor. Practices would include use of vertical retaining walls, where possible, to limit impacts on the Merced River channel. This would improve the ability of the river to undergo natural hydrologic processes, resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** The off-street and roadside parking areas at the maintenance and administrative complex would be paved to formalize and maximize visitor and employee parking within the existing footprint. Informal parking sites would be restored between Foresta Road and the Merced River. These actions would reduce the likelihood of petroleum hydrocarbons and sediment reaching the river, though not in a detectable manner, resulting in a local, long-term, negligible, beneficial impact on water quality.

**Biological Resource Actions.** Actions relevant to Alternatives 2-6 that would be located in Segment 4 include removal of asphalt and imported fill, recontouring, and planting of native vegetation within the 150 foot riparian buffer at Abbieville and the Trailer Village.

Removal of imported fill, removal of asphalt, and recontouring would remove these obstructions from the Abbieville/Trailer Village Areas. These obstructions are currently located within 150 feet of the riverbanks, and contribute altered floodplain hydrology along this segment of the Merced River. Removal of these existing obstructions would reduce existing interference of the facilities with the floodplain. This would result in a local, long-term, minor, beneficial impact to flooding.

Construction of the proposed biological resources actions could result in temporary disturbance to surface sediments and vegetation. Disturbance would result primarily from the use of heavy machinery for removal of imported fill and asphalt, and recontouring, and could result in increased levels of sediment reaching the Merced River. Additionally, construction related use of heavy machinery could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants, during the construction process. Adhering to

the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities at Abbieville and the Trailer Village, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would reduce sediment and other pollutant levels in stormwater that filters through these areas and drains into the Merced River. Therefore, the proposed restoration activities would result in a local, long-term, negligible, beneficial impact on water quality.

**Scenic Resource Actions.** Scenic resources actions relevant to Alternatives 2–6 that would be located along Segment 3 include selective removal of conifers at the Cascade Falls viewpoint. Selective removal of conifers in this area would not affect or alter hydrology, flooding, or water quality of the Merced River or other natural waterways.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** Asphalt and imported fill would be removed at Abbieville and El Portal Trailer Court housing. The area would be recontoured and planted with native riparian species and oaks within the 150-foot riparian buffer. This would restore natural runoff characteristics to the area, resulting in a local, long-term, negligible, beneficial impact on hydrology.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 & 4 would have local, long-term, negligible to minor, beneficial, hydrology, water quality, and floodplain impacts. Actions to manage user capacities, land use, and facilities would result in local, long-term, negligible, beneficial impacts on hydrology.

#### **Segments 5, 6, 7, and 8: South Fork Merced River**

##### *Impacts of Actions to Protect and Enhance River Values*

**Hydrology.** The removal of informal trails and informal parking in Segments 5, 6, 7, and 8, near archeology sites, picnic areas, riverbanks, and abandoned underground infrastructure, would slightly restore natural runoff processes, and thus would result in a local, long-term, negligible, beneficial impact on hydrology.

Under Alternatives 2–6, surface water withdrawals would continue at the Wawona Impoundment and would continue to be subject to the *1987 Wawona Water Conservation Plan*. Diversions would continue at the present rate of 0.59 cubic feet per second. When discharge in the South Fork Merced River is less than 6 cubic feet per second, diversions would be limited to 10% of the discharge in the South Fork Merced River to limit negative effects on aquatic life. This would result in a segment-wide, long-term, negligible, adverse impact on hydrology.

Seven campsites would be removed from the Wawona Campground because they could result in adverse affects on cultural resources. Campsite removal would decrease foot-traffic in this area,

leading to a potential recovery of vegetation. This would help to restore the hydrologic regime in the area, resulting in a local, long-term, negligible, beneficial impact on hydrology.

The Wawona maintenance yard consists of areas of denuded vegetation, compacted soils, and a parking lot, which alter the ability of the area to infiltrate runoff. Under Alternatives 2–6, areas of denuded vegetation, compacted soils, and portions of the parking lot that are located within 150 feet of the river would be removed. This would lead to increased infiltration and a more natural hydrologic regime, resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** The removal of informal trails and informal parking in Segments 5, 6, 7, and 8, near archeology sites, picnic areas, riverbanks, and abandoned underground infrastructure, would slightly decrease soil erosion. This, in turn, would result in a local, long-term, negligible, beneficial impact on water quality.

Development of a wastewater collection system at the Wawona Campground would include the building of a pump station above the Wawona Campground, to connect the facility to the existing wastewater treatment plant. This would alleviate existing issues related to old septic systems and associated infrastructure located on site, and would reduce the potential for effluent to migrate into the groundwater and the South Fork Merced River during times of heavy use. This would result in a local, long-term, moderate, beneficial impact on water quality.

Relocation of the Wawona dump station away from the South Fork Merced River would reduce the potential for pollutants to migrate to the river, resulting in a local, long-term, negligible, beneficial impact on water quality.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** Actions to remove roadside parking and to formalize South Fork Merced River access in Segments 5, 6, 7, and 8 would reduce trampling and soil compaction, resulting in a recovery of runoff processes. This would result in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Actions to remove roadside parking and to formalize South Fork Merced River access in Segments 5, 6, 7, and 8 would reduce trampling and erosion. In turn, this would reduce fine sediment loads in the river, though not in a detectable manner. This would result in a local, long-term, negligible, beneficial, impact on water quality.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions relevant to Alternatives 2-6 that would be located in Segment 7 include implementation of the water conservation plan at the Wawona surface water withdrawal site in order to adhere to the minimum flow analysis for the South Fork Merced River and the associated conservation plan.

Surface water withdrawals and the existing impoundment affect the free-flowing condition of the river, and minimally reduce the volume of water delivered downstream. Excessive water withdrawals can, however, adversely affect aquatic life. Implementation of the aforementioned conservation plan would reduce the volume of water withdrawn at Wawona, which would result in a segment-wide, long-term, minor, beneficial impact to hydrology downstream of the diversion point.

**Wawona.** Redesign of the proposed bus stop would result in negligible effects on hydrologic resources. During construction, minimal areas of the existing pavement and minimal roadside areas that are currently covered by grasses and low vegetation would be disturbed. Use of heavy equipment during construction would be limited, and the effects of heavy equipment use on water quality, including increases in releases of sediment and equipment-related pollutants, would be avoided through implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C). Therefore, this action would result in a local, short-term, negligible, adverse impact on water quality.

Installation of the proposed seating and sun cover would result in the installation of negligible areas of new impervious surfaces. Impervious surfaces can alter hydrology by reducing the volume of stormwater that is infiltrated, and increasing the volume of runoff, from a given area. However, given the very limited extent of the proposed facility, this area of new impervious surfaces would contribute to local, long-term, negligible, adverse impact on hydrology.

The proposed bus stop improvements are located outside of the 100-year floodplain. Therefore no effects on floodplains would occur.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segments 5-8 would have local, long-term, negligible, beneficial, hydrology, water quality, and floodplain impacts. Actions to manage user capacities, land use, and facilities would result in local, short-term and long-term, negligible to minor, beneficial and adverse impacts on the river's hydrology and water quality.

### **Summary of Impacts Common to Alternatives 2–6**

**Hydrology.** Actions common to Alternatives 2–6 would have long-term, minor to moderate, beneficial impacts on hydrology. Restoration actions associated with Alternatives 2–6 would decompact soil and restore meadow and riparian areas. Actions associated with the removal of impervious surfaces would increase infiltration and partially restore the natural hydrologic regime in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the Merced River, thereby restoring hydrologic processes in a detectable manner.

**Water Quality.** Actions common to Alternatives 2–6 would have long-term, minor, beneficial impacts on water quality. Restoration actions associated with Alternatives 2–6 would restore denuded vegetation and limit informal trails, leading to a reduction in erosion. Actions associated with in-river restoration would help to stabilize eroded areas, thereby reducing fine sediment in a detectable manner. Construction activities associated with restoration have the potential to adversely affect water quality over the short term, but would be mitigated to a negligible level by instituting mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C).

**Floodplains.** Actions common to Alternatives 2–6 would have long-term, beneficial impacts on floodplains, ranging from negligible to minor. Restoration actions associated with Alternatives 2–6 would reconnect the Merced River and its floodplain in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the river, partially reconnecting the river to its floodplain, and creating a nondetectable long-term, negligible, beneficial impact on 100-year floodplains.



## ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Pack stock used for administrative purposes would no longer graze on meadow vegetation near the Merced Lake Ranger Station. All administrative pack stock passing through the area would instead be required to carry pellet feed. This would help protect meadow vegetation, which in turn would produce a more natural hydrologic regime. This would result in a local, long-term, negligible, beneficial impact on hydrology.

Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced in Alternative 2, promoting dispersed camping. Concentrated camping areas would be converted to dispersed camping. This would reduce the potential for informal trails and vegetation trampling, and in turn reduced vegetation trampling would lead to an increase in the ability of the soil to infiltrate runoff. This action would not be expected to create a measurable change in hydrology in the Merced River and would result in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** The reduction of overnight capacities for Little Yosemite Valley and Merced Lake would reduce the potential for informal trails and vegetation trampling. In turn, this would reduce erosion but would not be expected to cause detectable change in Merced River water quality. Thus, reduced overnight capacities would result in a local, long-term, negligible, beneficial impact on water quality.

**Merced Lake High Sierra Camp.** Under Alternative 2, the Merced Lake High Sierra Camp would be closed and all facilities removed. In its place, dispersed camping at Merced Lake Backpackers Camping Area would expand into the High Sierra Camp footprint. The area of the former High Sierra Camp would be converted to designated wilderness.

With respect to hydrologic resources, removal of the Camp facilities and expansion of dispersed camping could result in the cutting of new trails and informal campsites. These activities could generate very localized and temporary increases in erosion and sedimentation in affected areas. However, these effects would be minimal to negligible in extent. With implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), potential water quality related impacts would be a local, short-term, negligible adverse impact on water quality.

Removal of the High Sierra Camp and expansion of camping into the areas would lessen impacts on water quality, hydrology, and flooding as compared to those of Alternative 1 (No Action). Impervious surfaces would be reduced, as would potential sources of water quality pollutants, and no potential floodplain obstructions would be installed. The resulting impacts would be local, long-term, negligible, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would result in a local, long-term, negligible, beneficial impact on hydrology.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Under Alternative 2, the Stoneman, Sugar Pine, and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. This action would have an appreciable effect on streamflow dynamics, allowing natural processes to prevail. Backwaters, rapid scour, and excessive sediment deposition upstream and downstream of bridges would be reduced. The removal of hard points associated with these bridges would promote channel migration and partially restore natural channel evolution. This action would improve hydrology in a clearly detectable manner and result in a local, long-term, major, beneficial impact on hydrology.

Under Alternative 2, all campsites, tent-style lodging, and associated infrastructure within the 100-year floodplain would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, and tent-style lodging at Housekeeping Camp. Other facilities that would be removed from the 100-year floodplain include select Yosemite Lodge infrastructure. Existing facilities located between the Village Store and Ahwahnee Meadow, including Ahwahnee Row housing and the Tecoya Dorms, would also be removed. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. The amount of impervious surface in restored areas would be reduced, increasing infiltration of runoff and restoring a more natural hydrologic regime. Removing infrastructure, including road prisms and ditches, would reconnect surface and groundwater within each meadow. Replanting restored areas with native vegetation would restore the natural runoff regime. In total, Alternative 2 would result in 337 acres of ecological restoration, corridorwide. These actions would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, moderate to major, beneficial impact on hydrology.

Temporary housing in the Lost Arrow parking lot would be removed and administrative parking would be reinstated, resulting in no net change in impervious surface area. This action would not affect hydrology.

Under Alternative 2, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points and restore natural runoff processes. This would be expected to have a measurable effect on hydrology in the river, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 2, the Stoneman, Sugar Pine, and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. These sites would have reduced scour and more stable riverbanks, which would reduce the amount of fine sediment in

the river. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 2, all campsites and associated infrastructure within the 100-year floodplain would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, and tent-style lodging at Housekeeping Camp. Other facilities that would be removed from the 100-year floodplain include select Yosemite Lodge infrastructure. Existing facilities located between the Village Store and Ahwahnee Meadow, including Ahwahnee Row housing and the Tecoya Dorms, would also be removed. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Methods for restoration would include recontouring, ditch removal, and decompaction. Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil, as decompaction occurs, using an excavator or a dozer with winged rippers. Earth-moving activities during construction have the potential to mobilize fine sediment, which would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would result in this impact being characterized as short-term, local, negligible, and adverse. After construction, restored areas would result in established vegetation that would be less likely to erode, thus reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, minor, beneficial impact on water quality.

Under Alternative 2, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points throughout the segment, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, thereby reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** Removal of the Stoneman, Sugar Pine and Ahwahnee bridges and associated berms would reduce constrictions in the Merced River and reduce water surface elevations during floods, thereby resulting in a local, long-term, minor, beneficial impact on floodplains.

Restoration of areas within the 100-year floodplain would occur, including locations at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campgrounds, former Upper River and Lower River campgrounds, Housekeeping Camp, and Yosemite Lodge. Existing facilities located between the Village Store and Ahwahnee Meadow, including Ahwahnee Row housing and the Tecoya Dorms, would also be removed. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows, which would increase

connectivity between the Merced River and its floodplain in a detectable manner. This would result in a local, long-term, moderate, beneficial impact on floodplains.

**Biological Resource Actions.** Proposed biological resource actions associated with Alternative 2 that would be deployed along Segment 2 include rerouting and consolidation of 350 feet of trail near Housekeeping Camp and Housekeeping Footbridge; removal of 900 feet of Northside Drive, relocation of the bike path, and vegetation restoration at Ahwahnee Meadow; restoration 1,335 feet of Southside Drive and road realignment at Stoneman Meadow, and application of engineering solutions to promote water flow at the Orchard Parking Lot, with installation of up to 275 feet of boardwalk at Curry Village; restoration of 35.6 acres of 10-year floodplain including decompaction of soils and removal of asphalt, former roads, and campsites, removal of the Lower River amphitheater structure and fill; removal of campsites within 100 feet of the river bed and banks with restoration of 25.1 acres of floodplain and riparian habitat at Valley Campgrounds; removal of informal trails and reduction of roadside parking at El Capitan meadow; restoration of 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged after the 1997 flood and subsequently removed), remove fill, decompact soils, and plant riparian plant species.

Rerouting and consolidation of trails, restoration of road areas and meadows, restoration of floodplain, decompaction, and removal of informal trails could contribute to increased stormwater infiltration capacity and increased storm event hydrologic concentration times. Restoration of riparian and floodplain vegetation would generally slow floodwaters in the vicinity of the restored area, more closely mimicking natural conditions, resulting in a local, long-term, minor, beneficial impact to hydrology and flooding.

Relocation and removal of facilities located in floodplain areas, including removal of existing amphitheater structure and fill, removal of campsites, removal of informal trails, relocation of paths, road realignments, and other proposed facility realignments would reduce existing constraints on the natural floodplain of the river. Reductions in these constraints would support the free-flowing condition of the river, and would reduce existing interference within the floodplain. Therefore, this is considered a segment-wide, long-term, minor, beneficial impact with respect to flooding.

Implementation of engineering solutions to promote water flow at the Orchard Parking Lot would alleviate existing stormwater/flood related constrictions at the parking lot. This would result in a local, long-term, minor, beneficial impact on flooding.

Construction of the proposed biological resources actions could result in temporary disturbance to surface sediments and vegetation. Disturbance would result primarily from the use of heavy machinery. Heavy machinery would be used for soil decompaction, removal and relocation of asphalt areas, recontouring of topography, rerouting of trails, removal of informal trails, and removal of other infrastructure as noted previously. Minimal additional disturbance could occur during restoration activities and boardwalk installation, due to localized disturbance. Additionally, construction related use of heavy machinery could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants, during the construction process. Adhering to the proposed mitigation measures MM-HYD-1 through

MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions that would occur under Alternative 2 along Segment 2 include movement of the unimproved parking area at Camp 6 north and closer to the Village Center, and rerouting of Northside Drive to outside of the 10-year floodplain, with removal of fill and restoration of meadow and floodplain ecosystems; and removal of three bridges including Stoneman Bridge, Sugar Pine Bridge, Ahwahnee Bridge and the associated road berms, including rerouting of trails and utilities, and redesign of affected roadways and intersections.

The three bridges that would be removed – Stoneman Bridge, Sugar Pine Bridge, and Ahwahnee Bridge – currently cause hydrologic constrictions along the Merced River. During moderate flow conditions, constrictions associated with these bridges interferes with natural hydrologic processes along the river, including reduction of channel migration, alteration of scour, and other hydrologic alterations. During high and flood flows, the bridges constrict flood flows, resulting in backup of flows behind the bridges, increases in flow velocity and scour in the vicinity of the bridges, and reduction in flows downstream of the bridges, in comparison to natural conditions. Therefore, removal of these three bridges would alleviate these conditions, resulting in a local, long-term, major, beneficial impact on hydrology and flooding.

Removal of the unimproved parking area at Camp 6 and rerouting of Northside Drive to outside of the 10-year floodplain, along with associated fill removal, would result in the removal of existing structures that interfere with floodplain function. Removal of these structures would thereby reduce existing obstructions within the floodplain, and would thereby result in a net local, long-term, minor, beneficial impact on flooding.

Removal of the various trails, berms, roadways, and intersections associated with the proposed bridge removals and the Camp 6 actions would represent the removal of existing obstructions within the floodway corridor of the Merced River. Removal of these features would contribute to a return towards natural flood stage hydrologic processes in the vicinity of these existing features, by removing floodplain obstructions from the 10-year floodplain. Therefore, these proposed actions would result in a local, long-term, minor, beneficial impact on flooding.

With respect to water quality, during construction, removal of the three bridges and other infrastructure from the Merced River and its floodplain, and associated restoration activities, would result in temporary construction related impacts to water quality. These could include incidental releases of sediment into natural waterways and the Merced River. Additionally, the use of heavy construction equipment during removal of bridges and other facilities could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants during the construction period. Adhering to the

proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, temporary, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Under Alternative 2, visitor-serving facilities and overall use would be reduced, including in riverside areas, thereby decreasing trampling, informal trail development, and riverbank erosion. The number of employee housing units, campsites, and lodging units would decrease. In addition, informal parking would also be reduced. These actions would have a net reduction in total impervious surface area, allowing soils and vegetation to recover, and lead to increased infiltration of runoff, reduced riverbank erosion, and increased streamflow dynamics. This would be expected to have a measurable effect on hydrology, but would not be expected to have an overall effect on the character of the Merced River, thus resulting in a segmentwide, long-term, minor, beneficial impact on hydrology.

Removal of trails and formalizing picnic areas would increase infiltration of runoff, restore riparian vegetation, and restore a more natural hydrologic regime. Formalizing Merced River access points and trails would reduce vegetation trampling. This would be expected to have a measurable effect on hydrology in the river, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 2, total visitation, residential and visitor serving facilities, and parking within the Valley would be reduced. These actions would reduce trampling of riparian vegetation, informal trail development, and riverbank erosion. Removal of facilities and informal parking would reduce impervious surfaces, allow soils and vegetation to recover, and improve infiltration. With the number vehicles entering the Valley reduced, the concentration of vehicle-associated pollutants in stormwater runoff would also decrease. These actions would be expected to lead to a detectable reduction in fine sediment and pollutants entering the Merced River, resulting in a segmentwide, long-term, minor, beneficial impact on water quality.

New parking areas located at the West of Yosemite Lodge parking and parking areas moved at Camp 6 would generate discharges of sediment and automobile related pollutants into stormwater. Release of these pollutants could result in negligible degradation of water quality downstream, and these actions constitute a local, long-term, negligible, adverse impact on water quality.

Removal of trails and formalizing picnic areas would restore riparian vegetation and reduce erosion. Formalizing Merced River access points and trails would reduce vegetation trampling and help to stabilize riverbanks. This would be expected to result in a local, long-term, negligible, beneficial impact on water quality.

**Curry Village & Campgrounds.** Actions to manage user capacities, land use, and facilities in this area would include an increase in total units from 400 existing units to 433 units. Total lodging within this area would consist of 290 tent-style lodging units retained in Curry Village, 78 newly constructed hard-sided units in Boys Town, 18 units retained at Stoneman House, and 47 cabin-with-bath units retained in Curry Village.

Installation of the new units in Boys Town would require the addition of new impervious surfaces, and a net increase in total impervious surface area would be anticipated within this area. As noted previously, impervious surfaces prevent the infiltration of stormwater into the subsurface, causing increased discharges of stormwater and a shortened hydrologic concentration time, as compared with those of under existing conditions. New impervious surfaces would be limited to facilities footprints, and some additional access areas. Because new impervious surface areas would be limited in extent, the proposed projects would result in a local, long-term, negligible, adverse impact on hydrology.

Construction of the proposed new units could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy construction equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

**Floodplains.** Under Alternative 2, existing development would be removed from the floodplain in several areas (see *Impacts of Actions to Protect and Enhance River Values*, above), no new development would occur within these areas, and the park would undertake active (e.g., Yellow Pines Campground) and passive (e.g., Upper and Lower Rivers Campgrounds) restoration actions. These actions would have a local, long-term, minor, beneficial impact on Segment 2 floodplains.

**Camp 6 and Yosemite Village.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 primarily concern transportation improvements. Proposed projects would involve improvements to intersection function at Village Drive and Northside Drive near Camp 6; relocation and redevelopment of the existing overflow parking area west of Yosemite Lodge to provide 150 additional overnight parking spaces; relocation of the Camp 6 day use parking area outside of the 10-year floodplain; and the rerouting of Northside Drive to south of the parking area. The Camp 6/ Village Center parking area would be increased to 550 units by redeveloping part of the current administrative footprint in that area. One hundred parking spaces would be added to the Yosemite Village parking area.

Installation of new parking areas and roadways would require the construction of new impervious surfaces. Net increases in impervious surface area would be largely offset by the removal of select existing parking facilities and roadways, as noted above, as well as improvements in drainage facilities associated with the new structures, and the addition of bioswales in parking areas. However, based on the anticipated increase in parking and road area, a net increase in impervious surfaces is anticipated. As noted elsewhere, impervious surfaces cause increased discharges of stormwater and shorten



hydrologic concentration time. The proposed actions would therefore result in a local, long-term, minor, adverse impact on stormwater hydrology.

Demolition of existing parking areas and roadways slated for removal, as well as construction of new parking areas and roads discussed above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would be required, and would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The use of the proposed new parking areas would serve to consolidate existing parking activities into formalized areas, reducing reliance on informal parking areas. Therefore, the anticipated increase in formalized parking spaces is not expected to result in increased use, but would accommodate existing use that currently relies on other facilities. Therefore, no net change in water quality pollutants related to parking lots is anticipated, because existing effects would be consolidated into formalized parking areas.

The existing Camp 6 day use parking area is located within the 10-year floodplain. Parking lots do not generally constitute major obstructions to flood flows, and so their presence within a floodplain is generally less obstructive than other vertical development; although minor effects, such as localized interference with flood flows, could still occur during a flooding event. A parking lot in the floodplain does, however, remove floodplain vegetation and soils. This rougher natural surface slows floodwaters, filters suspended sediment, and buffers the impacts of flooding. Therefore, removal of the existing facility to outside of the 10-year floodplain would reduce the frequency of inundation, and would reduce existing pressures on the existing floodplain area. Other facilities would not appreciably affect floodplain areas. These actions would result in a local, long-term, minor to moderate, beneficial impact with respect to flooding.

**Yosemite Lodge and Camp 4.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 are limited to removal of the existing on-grade pedestrian crossing located west of the intersection of Northside Drive and Yosemite Lodge Drive. This action would be completed in order to alleviate pedestrian/vehicle conflicts. The crossing would be moved to west of the existing intersection.

The impervious surfaces associated with this crossing would be removed from their existing location, and moved west, to a new location. Therefore, this action is not expected to result in a noticeable increase or decrease in impervious surfaces or other features that would affect stormwater flows, and therefore would not affect on site hydrology.

Demolition of the existing pedestrian crossing, as well as construction of the proposed relocated crossing, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy construction related equipment would also disturb surface sediments within affected areas, and could result in the accidental release of fuels,

oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The facilities in question would be located outside of the existing floodplain, and therefore would not affect flooding.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, long-term, beneficial impacts on hydrology, water quality, and floodplains, ranging from minor to moderate. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, minor to moderate, beneficial impacts on hydrology, water quality, and floodplains.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

**Hydrology.** Oak protection, removal of fill, and decompaction of soils in the Odger's fuel storage area would promote infiltration in the area, but would not have a discernible effect on the hydrology of the river, thus resulting in a local, long-term, negligible, beneficial impact on hydrology.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Hydrology.** Construction of new housing in the Rancheria Flatt and Abbieville areas of El Portal would involve vegetation removal, soils compaction, and increased areas of impervious surfaces outside the 100-year floodplain. These actions would have a local, long-term, minor, adverse impact on hydrology.

**Water Quality.** Construction of new housing and parking lots, as described above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have local, long-term, negligible, beneficial impact on the river's hydrology and water quality. Actions to manage visitor capacity, land use, and facilities would have a long-term, minor, adverse impact on hydrology.

## **Segments 5, 6, 7, and 8: South Fork Merced River**

### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas, and removal of the Wawona Golf Course would result in reduced trampling, increased area of natural vegetative cover, and an increase in soil infiltration. Impervious surfaces would be reduced, leading to an increase in the infiltration capacity of the area, thereby restoring the hydrologic regime. This would be expected to have local and segmentwide, long-term, moderate, beneficial impacts on hydrology.

**Water Quality.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas, and removal of the Wawona Golf Course would result in reduced trampling and greater cover of native vegetation that would be less likely to erode and would reduce stormwater runoff through improved infiltration. The work would require the use of heavy equipment, which could cause short-term, adverse impacts to water quality. With implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), such local impacts would be reduced to short-term, negligible to minor, and adverse. Over the long-term, the impacts on water quality would be segmentwide, minor, and beneficial.

**Floodplains.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas would increase connectivity between the South Fork Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Along Segment 7 under Alternative 2, relocation of two stock use campground sites from sensitive biological resource areas to Wawona Stables would result in long-term, localized, negligible, beneficial impacts to river or floodplain hydrology. Minor construction activities associated with relocation of these facilities could result in potential construction related water quality impacts – primarily the temporary release of elevated sediment levels into stormwater during construction activities, but to a lesser extent, potential release of oils, greases, fuels, and other construction related water quality pollutants associated with the use of heavy equipment. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, negligible, and adverse.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Under Alternative 2, visitor use would be reduced in Segments 5, 6, 7, and 8, including use in riverside areas. This would result in a decrease in trampling, informal trail development, and riverbank erosion. This also would lead to increased infiltration of runoff, reduced riverbank erosion, and increased streamflow dynamics. These results would be expected to have a measurable effect on hydrology, but would not be expected to have an overall effect on the character of the South Fork Merced River, thus resulting in a segmentwide, long-term, minor, beneficial impact on hydrology.

The removal of facilities under Alternative 2 would reduce the amount of impervious surfaces within Segments 5, 6, 7, and 8, leading to a more natural hydrologic regime, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial, impact on hydrology.

**Water Quality.** Under Alternative 2, visitor use would be reduced Segments 5, 6, 7, and 8, including use in riverside areas. This would result in a decrease in trampling, informal trail development, and riverbank erosion. While vehicles can contribute hydrocarbons, oil and grease, and metals to stormwater runoff, these actions would reduce the number of vehicles entering the South Fork Merced River corridor and thus result in a corresponding reduction in vehicle-associated pollutants. These actions would be expected to lead to a detectable reduction in fine sediment and pollutants, thereby resulting in a segmentwide, long-term, minor, beneficial impact on water quality.

**Wawona.** Removal of 32 campsites from areas located within the 100-year floodplain would reduce existing effects of trampling on riverbank areas, and would support reduced erosion rates within the area. This would result in a local, long-term, minor, beneficial impact on water quality due to reduced erosion rates. Similarly, removal of 32 campsites from within the existing floodplain would result in a net reduction in floodplain area that is impacted by existing facilities. Removal of these sites would result in a local, long-term, negligible, beneficial impact on floodplains and flooding. Finally, removal of the existing facilities would involve minimal demolition related activities, which could include the use of heavy machinery, as well as other minor restoration activities. These construction activities would require implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), which would ensure that potential water quality impacts would be local, short-term, negligible, and adverse.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segments 5-8 would have local and segmentwide, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

**Hydrology.** Actions associated with Alternative 2 would have long-term, minor to major, beneficial, impacts on hydrology. Restoration actions associated with all alternatives would decompact soil and restore meadow and riparian areas. Actions associated with the removal of impervious surfaces would increase infiltration and partially restore the natural hydrologic regime in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the Merced River, thereby restoring hydrologic processes in a detectable manner. Actions associated with bridge removal would restore lost hydrologic processes in a clearly detectable manner and would have a long-term, moderate to major, beneficial impact on hydrology.

**Water Quality.** Actions associated with Alternative 2 would have long-term, minor, beneficial impacts on water quality. Restoration actions associated with Alternatives 2-6 would restore denuded vegetation and limit informal trails, leading to a reduction in erosion. Actions associated with in-river

restoration would help to stabilize eroded areas, thereby reducing fine sediment in a detectable manner. Construction activities associated with restoration have the potential to adversely affect water quality over the short term, but would be mitigated to a negligible level by instituting mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C).

**Floodplains.** Actions associated with Alternative 2 would have long-term, negligible to moderate, beneficial and adverse impacts on floodplains. Restoration actions associated with Alternatives 2–6 would reconnect the Merced River and its floodplain in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the river, partially reconnecting the river to its floodplain, combined with restoration of areas within the 100-year floodplain would combine to create a long-term, moderate, beneficial impact on 100-year floodplains.

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

The cumulative impacts analysis for Alternative 2 reflects the historic timeframe for installation of the various past, present, and reasonably foreseeable future actions listed below. The spatial dimension for the cumulative impacts analysis encompasses the portion of the Merced River watershed that is located within the park. The cumulatively considerable projects for Alternative 2 would be the same as those presented in Alternative 1.

#### ***Overall Cumulative Impact Common for Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

Under Alternative 2, removal of riprap, removal of three bridges and unnecessary infrastructure, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, moderate to major, beneficial cumulative impacts on hydrology, and floodplains, and a local, long-term, minor to moderate, beneficial cumulative impact on water quality.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Pack stock used for administrative purposes would graze on meadow vegetation near the Merced Lake Ranger Station in accordance with established grazing capacities. This would help protect meadow vegetation, which in turn would produce a more natural hydrologic regime. This would result in a local, long-term, negligible, beneficial impact on hydrology.

Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced under Alternative 3, thereby promoting dispersed camping. Concentrated camping areas would be converted

to dispersed camping. This would reduce the potential for informal trails and vegetation trampling, thereby leading to an increase in the ability of the soil to infiltrate runoff. This action would not be expected to create a measurable change in hydrology in the Merced River and would result in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** The reduction of overnight capacities for Little Yosemite Valley and Merced Lake would reduce the potential for informal trails and vegetation trampling. In turn, this would reduce erosion but would not be expected to cause detectable change in Merced River water quality. Thus, reduced overnight capacities would result in a local, long-term, negligible, beneficial, impact on water quality.

**Merced Lake High Sierra Camp.** Under Alternative 3 the Merced Lake High Sierra Camp would be closed, all existing permanent infrastructure removed, and the area converted into a temporary pack camp with a maximum of 15 people allowed. The area would be converted to designated wilderness.

With respect to hydrologic resources, removal of existing facilities would result in a negligible net reduction in impervious surfaces on site. This would provide a negligible benefit to hydrology, because impervious surfaces contribute to increased stormwater runoff and other effects on hydrology. Total impervious surfaces removed would be less than half an acre. Therefore, potential impacts on hydrology associated with this action are considered to be local, long-term, negligible, and beneficial.

Removal of existing facilities and conversion to a temporary pack camp in the same vicinity could result in negligible disturbance during facility removal and the establishment of pack camp sites. These activities could generate very local and temporary increases in erosion and sedimentation in affected areas. However, these effects would be limited to the construction period, and would be negligible in extent. With implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), potential water quality related impacts would have a local, temporary, negligible, adverse impact on water quality.

Removal of the High Sierra Camp and conversion to a temporary stock camp would lessen impacts on water quality, hydrology, and flooding as compared to those of Alternative 1 (No Action). Impervious surfaces would be reduced, as would potential sources of water quality pollutants, and no potential floodplain obstructions would be installed. The resulting impacts would be local, long-term, negligible, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would result in a local, long-term, negligible, beneficial impact on hydrology.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Under Alternative 3, the Stoneman, Sugar Pine, and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. This action would have an appreciable effect on streamflow dynamics, allowing natural processes to prevail. Backwaters,

rapid scour, and excessive sediment deposition upstream and downstream of bridges would be reduced. The removal of hard points associated with these bridges would promote channel migration and partially restore natural channel evolution. This action would improve hydrology in a clearly detectable manner and result in a local, long-term, major, beneficial impact on hydrology.

Under Alternative 3, campsites and associated infrastructure located within 150 feet of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, and Yellow Pines Campground. All tent-style lodging at Housekeeping Camp would be removed and the area would be repurposed as river access. Restoration actions would result in the restoration of approximately 230 acres of meadow, riparian, and other habitat types.

Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. The amount of impervious surface in restored areas would be reduced, increasing infiltration of runoff and restoring a more natural hydrologic regime. Removing infrastructure, including road prisms and ditches, would reconnect surface and groundwater within each meadow. Replanting restored areas with native vegetation would restore the natural runoff regime. These actions would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, moderate, beneficial impact on hydrology.

Under Alternative 3, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at Merced River access points, and restore natural runoff processes. This would be expected to have a measurable effect on hydrology in the river, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 3, the Stoneman, Sugar Pine and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. These sites would have reduced scour and more stable riverbanks, thus reducing the amount of fine sediment in the river. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 3, campsites and associated infrastructure located within 150 feet of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, and Yellow Pines Campgrounds. All tent-style lodging at Housekeeping Camp would be removed and the area would be repurposed as river access. Methods for restoration would include recontouring, ditch removal, and decompaction. Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase



revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil, as decompaction occurs, with an excavator or dozer with winged rippers. Earth-moving activities during construction have the potential to mobilize fine sediment, which would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce this impact to negligible. After construction, restored areas would result in established vegetation that would be less likely to erode, thus reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 3, river access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable Merced River access points throughout the segment, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, thereby reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** Removal of the Sugar Pine and Ahwahnee bridges and associated berms would reduce constrictions in the Merced River and would reduce water surface elevations during floods, resulting in a local, long-term, minor, beneficial impact on floodplains.

Restoration of areas within the 150-foot river buffer would include locations at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, former Upper River and Lower River campgrounds, Housekeeping Camp, the Curry Orchard parking lot, and Yosemite Lodge. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows, which would increase connectivity between the Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Proposed biological resource actions associated with Alternative 3 that would be deployed along Segment 2 include rerouting and consolidation of 350 feet of trail near Housekeeping Camp and Housekeeping Footbridge; removal of 900 feet of Northside Drive, relocation of the bike path, and vegetation restoration at Ahwahnee Meadow; restoration 1,335 feet of Southside Drive and road realignment at Stoneman Meadow, and application of engineering solutions to promote water flow at the Orchard Parking Lot, with installation of up to 275 feet of boardwalk at Curry Village; restoration of 30 acres of 10-year floodplain including decompaction of soils and removal of asphalt, former roads, and campsites, removal of the Lower River amphitheater structure and fill; restoration of 12 acres of riparian habitat at North Pines Campgrounds; removal of select informal trails at El Capitan meadow; restoration of 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged after the 1997 flood and subsequently removed), remove fill, decompact soils, and plant riparian plant species.

Rerouting and consolidation of trails, restoration of road areas and meadows, restoration of floodplain, decompaction, and removal of informal trails could contribute to increased stormwater infiltration capacity and increased storm event hydrologic concentration times. Restoration of riparian and floodplain vegetation would generally slow floodwaters in the vicinity of the restored area, more closely mimicking natural conditions, resulting in a local, long-term, minor, beneficial impact to hydrology and flooding.

Relocation and removal of facilities located in floodplain areas, including removal of existing amphitheater structure and fill, removal of campsites, removal of informal trails, relocation of paths, road realignments, and other proposed facility realignments would reduce existing constraints on the natural floodplain of the river. Reductions in these constraints would support the free-flowing condition of the river, and would reduce existing interference within the floodplain. Therefore, this is considered a segment-wide, long-term, minor, beneficial impact with respect to flooding.

Implementation of engineering solutions to promote water flow at the Orchard Parking Lot would alleviate existing stormwater/flood related constrictions at the parking lot. This would result in a local, long-term, minor, beneficial impact on flooding.

Construction of the proposed biological resources actions could result in temporary disturbance to surface sediments and vegetation. Disturbance would result primarily from the use of heavy machinery. Heavy machinery would be used for soil decompaction, removal and relocation of asphalt areas, recontouring of topography, rerouting of trails, removal of informal trails, and removal of other infrastructure as noted previously. Minimal additional disturbance could occur during restoration activities and boardwalk installation, due to localized disturbance. Additionally, construction related use of heavy machinery could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants, during the construction process. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions that would occur under Alternative 3 along Segment 2 would be the same as those that would occur under Alternative 2 along Segment 2. Potential impacts associated with these activities under Alternative 3 would be the same as those discussed for Alternative 2. Please refer to the prior discussion for impacts on hydrology, floodplains, and water quality for Alternative 2, Segment 2.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** Under Alternative 3, visitor-serving facilities and overall use would be reduced, including in riverside areas, thereby decreasing trampling, informal trail development, and riverbank erosion. While

number of campsites would increase slightly, employee housing and overnight lodging would decrease. In addition, informal parking would also be reduced. These actions would have a net reduction in total impervious surface area, allowing soils and vegetation to recover, and lead to increased infiltration of runoff, reduced riverbank erosion, and increased streamflow dynamics. This would be expected to have a measurable effect on hydrology, but would not be expected to have an overall effect on the character of the Merced River, thus resulting in a segmentwide, long-term, minor, beneficial impact on hydrology.

Temporary housing in the Lost Arrow parking lot would be removed and administrative parking would be reinstated, resulting in no net change in impervious surface area. This action would not affect hydrology.

Removal of trails and formalizing picnic areas would increase infiltration of runoff, restore riparian vegetation, and restore a more natural hydrologic regime. Formalizing river access points and trails would reduce vegetation trampling. This would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor impact on hydrology.

**Water Quality.** Under Alternative 3, total visitation, residential and visitor serving facilities, and parking within the Valley would be reduced. These actions would reduce trampling of riparian vegetation, informal trail development, and riverbank erosion. Removal of facilities and informal parking would reduce impervious surface area, allow soils and vegetation to recover, and improve infiltration. With the number vehicles entering the Valley reduced, the concentration of vehicle-associated pollutants in stormwater runoff would also decrease. This would be expected to lead to a detectable reduction in fine sediment and pollutants, thereby resulting in a segmentwide, long-term, minor, beneficial impact on water quality.

New parking areas located at the West of Yosemite Lodge parking and parking areas moved at Camp 6 would generate discharges of sediment and automobile related pollutants into stormwater. Release of these pollutants could result in negligible degradation of water quality downstream, and these actions constitute a local, long-term, minor, adverse negligible impact on water quality.

Removal of trails would restore riparian vegetation and reduce erosion. Formalizing picnic areas, Merced River access points and trails would reduce vegetation trampling and help to stabilize riverbanks. This would be expected to result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** Under Alternative 3, existing development would be removed from the floodplain in several areas (see *Impacts of Actions to Protect and Enhance River Values*, above). No new development would occur within these areas, and the park would provide for passive restoration of previously disturbed areas (e.g., Upper and Lower Rivers Campgrounds). These actions would have a local, long-term, negligible, beneficial impact on Segment 2 floodplains.

**Curry Village & Campground.** Actions to manage user capacities, land use, and facilities in this area would include a reduction in total units from 400 existing units to 355 units. Total lodging within this area would include 290 tent-style lodging units retained in Curry Village, 18 units retained at

Stoneman House, and 47 cabin-with-bath units retained in Curry Village. At Boys Town, Southside Drive would be re-routed and restored.

Removal of approximately 45 existing units would result in negligible reductions in impervious surfaces associated with existing facilities and access areas. Re-routing of Southside Drive would result in essentially no net change in total impervious surface area. Impervious surfaces can increase volumes of stormwater runoff and reduce hydrologic concentration time. Therefore, a local, long-term, negligible, beneficial impact to hydrology would result from these actions.

Removal of the existing units and rerouting/construction associated with Southside Drive could result in minimal and temporary release of debris, sediment, and other potential water quality pollutants into stormwater. The use of heavy construction related equipment, as warranted, would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The existing and proposed facilities would be located outside of the 100-year floodplain and therefore would not interfere with floodplain characteristics or flood flows.

**Camp 6 and Yosemite Village.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 primarily concern transportation improvements. Proposed projects would involve improvements to intersection function at Village Drive and Northside Drive near Camp 6; relocation and redevelopment of the existing overflow parking area west of Yosemite Lodge to provide 150 additional parking spaces; relocation of the Camp 6 day use parking area outside of the 10-year floodplain; and the rerouting of Northside Drive. The Camp 6/Village Center parking area would be increased to 550 units by redeveloping part of the current administrative footprint in that area. One hundred parking spaces would be added to the Yosemite Village parking area. The existing tour bus drop off area would be relocated to the Highland Court area, in order to provide 3 additional bus loading/unloading spaces. The Highland Court area is currently used for the placement of temporary housing in the existing parking lot, following the 1997 flood.

Installation of new parking areas and roadways would require the construction of new impervious surfaces. Net increases in impervious surface area would be largely offset by the removal of select existing parking facilities and roadways, as noted above, as well as improvements in drainage facilities associated with the new structures, and the addition of bioswales in parking areas. However, based on the anticipated increase in parking and road area, a net increase in impervious surfaces is anticipated. As noted elsewhere, impervious surfaces cause increased discharges of stormwater and shorten hydrologic concentration time. This would result in a local, long-term, minor, adverse impact on stormwater hydrology. Relocation of the bus drop-off area and additional bus loading and unloading spaces would not result in a change in impervious surfaces, because the affected areas are already impervious.

Demolition of existing parking areas and roadways slated for removal, as well as construction of new parking areas and roads and other activities discussed above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff.

Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The use of the proposed new parking areas would serve to consolidate existing parking activities into formalized areas, reducing reliance on informal parking areas. Therefore, the anticipated increase in formalized parking spaces is not expected to result in increased use, but would accommodate existing use that currently relies on other facilities. Similarly, moving the existing bus stop to a new location would not represent a new or increased intensity of use. Therefore, no net change in water quality pollutants related to parking lots is anticipated, because existing effects would be consolidated into formalized parking areas.

The existing Camp 6 day use parking area is located within the 10-year floodplain. Parking lots do not generally constitute major obstructions to flood flows, and so their presence within a floodplain is generally less obstructive than other vertical development; although minor effects, such as localized interference with flood flows, could still occur during a flooding event. A parking lot in the floodplain does, however, remove floodplain vegetation and soils. The rougher natural surfaces of vegetation and soils slow floodwaters, filter suspended sediment, and buffer the impacts of flooding. Therefore, removal of the existing facility to outside of the 10-year floodplain would reduce the frequency of inundation, and would reduce existing pressures on the existing floodplain area. Other facilities would not appreciably affect floodplain areas. These actions would result in a local, long-term, minor to moderate, beneficial impact with respect to flooding.

**Yosemite Lodge and Camp 4.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 are limited to removal of the existing on-grade pedestrian crossing located west of the intersection of Northside Drive and Yosemite Lodge Drive. This action would be completed in order to alleviate pedestrian/vehicle conflicts. The crossing would be moved to west of the existing intersection.

The impervious surfaces associated with this crossing would be removed from their existing location, and moved west, to a new location. Therefore, this action is not expected to result in a noticeable increase or decrease in impervious surfaces or other features that would affect stormwater flows, and therefore would not affect on site hydrology.

Demolition of the existing pedestrian crossing, as well as construction of the proposed relocated crossing, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy construction related equipment would also disturb surface sediments within affected areas, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate

(see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The facilities in question would be located outside of the existing floodplain, and therefore would not affect flooding.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, long-term, minor to moderate, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Oak protection, removal of fill, and decompaction of soils in the Odger's fuel storage area would promote infiltration in the area, but would not have a discernible effect on the hydrology of the Merced River, thus resulting in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** Parking restrictions in the Odger's fuel storage area would result in established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Hydrology.** Construction of new housing in the Rancheria Flatt area of El Portal would involve vegetation removal, soils compaction, and increased areas of impervious surfaces outside the 100-year floodplain. These actions would have a local, long-term, minor, adverse impact on hydrology.

**Water Quality.** Construction of new housing and parking lots, as described above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1, through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have local, long-term, negligible, beneficial impact on the river's hydrology and water quality. Actions to manage visitor capacity, land use, and facilities would have a long-term, minor, adverse impact on hydrology.

## Segments 5, 6, 7, and 8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

**Hydrology.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas, and removal of the Wawona Golf Course would result in reduced trampling, increased area of natural vegetative cover, and an increase in soil infiltration. Impervious surfaces would be reduced, leading to an increase in the infiltration capacity of the area, thereby restoring the hydrologic regime. This would be expected to have local and segmentwide, long-term, moderate, beneficial impacts on hydrology.

**Water Quality.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas, and removal of the Wawona Golf Course would result in reduced trampling and greater cover of native vegetation that would be less likely to erode and would reduce stormwater runoff through improved infiltration. The work would require the use of heavy equipment, which could cause short-term, adverse impacts to water quality. With implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), such local impacts would be reduced to short-term, negligible to minor, and adverse. Over the long-term, the impacts on water quality would be segmentwide, minor, and beneficial.

**Floodplains.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas would increase connectivity between the South Fork Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Along Segment 7 under Alternative 3, relocation of two stock use campground sites from sensitive biological resource areas to Wawona Stables would be the same as described for Alternative 2, and therefore would incur the same impacts as discussed for Alternative 2. Please refer to the discussion for Alternative 2.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** The removal of facilities under Alternative 3 would reduce the amount of impervious surfaces within Segments 5, 6, 7, and 8, leading to a more natural hydrologic regime, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on hydrology.

**Wawona.** Removal of 27 campsites from areas located within 150 feet of the river would reduce existing effects of trampling on riverbank areas, and would support reduced erosion rates within the area. This would result in a local, long-term, minor, beneficial impact on water quality due to reduced erosion rates. Similarly, removal of 27 campsites from within the existing floodplain would result in a net reduction in floodplain area that is impacted by existing facilities. Removal of these sites would result in a local, long-term, negligible, beneficial impact on floodplains and flooding. Finally, removal of the existing facilities would involve minimal demolition related activities, which could include the use of heavy machinery, as well as other minor restoration activities. These construction activities would require implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as



appropriate (see Appendix C), which would ensure that potential water quality impacts would be local, short-term, negligible, and adverse.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segments 5-8 would have local, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains.

### **Summary of Impacts of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

**Hydrology.** Actions associated with Alternative 3 would have long-term, moderate to major, beneficial impacts on hydrology. Restoration actions associated with Alternative 3 would decompact soil and restore meadow and riparian areas. Actions associated with the removal of impervious surfaces would increase infiltration and partially restore the natural hydrologic regime in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the Merced River, thereby restoring hydrologic processes in a detectable manner.

**Water Quality.** Actions associated with Alternative 3 would have long-term, minor, beneficial impacts on water quality. Restoration actions associated with Alternative 3 would restore denuded vegetation and limit informal trails, leading to a reduction in erosions. Actions associated with in-river restoration would help to stabilize eroded areas, thereby reducing fine sediment in a detectable manner. Construction activities associated with restoration have the potential to adversely affect water quality over the short term, but would be mitigated to a negligible level by instituting measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C).

**Floodplains.** Actions associated with Alternative 3 would have negligible to minor, beneficial and adverse, long-term impacts on floodplains. Restoration actions associated with Alternative 3 would reconnect the Merced River and its floodplain in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the Merced River, partially reconnecting the river to its floodplain and creating a long-term, minor, beneficial impact on 100-year floodplains.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The cumulative impacts analysis for Alternative 3 reflects the historic timeframe for installation of the various past, present, and reasonably foreseeable future actions listed below. The spatial dimension for the cumulative impacts analysis encompasses the portion of the Merced River watershed that is located within the Park. The cumulatively considerable projects for Alternative 3 would be the same as those presented in Alternative 1.

***Overall Cumulative Impact Common for Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

Under Alternative 3, removal of riprap, removal of three bridges and unnecessary infrastructure, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, moderate to major, beneficial cumulative impacts on hydrology and floodplains, and a local, long-term, minor to moderate, beneficial cumulative impact on water quality.

***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

**Segment 1: Merced River Above Nevada Fall**

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Pack stock used for administrative purposes would no longer graze on meadow vegetation near the Merced Lake Ranger Station. All administrative pack stock passing through the area would instead be required to carry pellet feed. This would help protect meadow vegetation, which in turn would produce a more natural hydrologic regime. This would result in a local, long-term, negligible, beneficial impact on hydrology.

Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced under Alternative 4, thereby promoting dispersed camping. Concentrated camping areas would be converted to dispersed camping. This would reduce the potential for informal trails and vegetation trampling. In turn, this would lead to an increase in the ability of the soil to infiltrate runoff. This action would not be expected to create a measurable change in hydrology in the Merced River and would result in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** The reduction of overnight capacities for Little Yosemite Valley and Merced Lake would reduce the potential for informal trails and vegetation trampling. In turn, this would reduce erosion but would not be expected to cause detectable change in Merced River water quality. Thus, reduced overnight capacities would result in a local, long-term, negligible, beneficial impact on water quality.

**Merced Lake High Sierra Camp.** Under Alternative 4, the Merced Lake High Sierra Camp would be closed and the area restored to natural conditions, as designated wilderness.

With respect to hydrologic resources, removal of existing facilities would result in a negligible net reduction in impervious surfaces on site. This would provide a negligible benefit to hydrology, because impervious surfaces increase stormwater runoff, among other effects on hydrology. Total impervious surfaces removed would be less than half an acre. Therefore, potential impacts on hydrology associated with this action are considered to be local, long-term, negligible, and beneficial.

Removal of existing facilities and restoration to natural conditions could result in negligible disturbance during facility removal and the establishment of restored vegetation. These activities could generate very local and temporary increases in erosion and sedimentation in affected areas. However, these effects would be limited to the construction period, and would be minimal to negligible in extent. With implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), potential water quality related impacts would be a local, temporary, negligible adverse impact on water quality.

Removal of the High Sierra Camp and conversion to a temporary stock camp would lessen impacts on water quality, hydrology, and flooding as compared to those of Alternative 1 (No Action). Following construction, the area would experience reduced trampling, which could result in negligible reductions in erosion on site. Impervious surfaces would be reduced and no potential floodplain obstructions would be installed. The resulting impacts would be local, long-term, negligible, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would result in a local, long-term, negligible, beneficial impact on hydrology.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Under Alternative 4, the Sugar Pine and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. This action would have an appreciable effect on streamflow dynamics, allowing natural processes to prevail. Backwaters, rapid scour, and excessive sediment deposition upstream and downstream of bridges would be reduced. The removal of hard points associated with these bridges would promote channel migration and partially restore natural channel evolution. This action would improve hydrology in a clearly detectable manner and result in a local, long-term, moderate to major, beneficial impact on hydrology.

The placement of large wood (including large trees with root wads) near Stoneman Bridge would add complexity by creating scour around the large wood area and deflecting flows. Depths would be deeper in the reduced area of the Merced River channel. This would have a slightly detectable impact on river dynamics, but would not be expected to have an overall effect on the character of the Merced River, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

Under Alternative 4, all campsites and associated infrastructure within 150 feet of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campground, Yellow Pines Campground, and tent-style lodging at Housekeeping Camp. Other facilities that would be removed from the 100-year floodplain include the select Yosemite Lodge infrastructure. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows.

Restoration actions would result in the restoration of approximately 194 acres of meadow, riparian, and other habitat types. The amount of impervious surface in restored areas would be reduced,

increasing infiltration of runoff and restoring a more natural hydrologic regime. Removing infrastructure, including road prisms and ditches, would reconnect surface and groundwater within each meadow. Replanting restored areas with native vegetation would restore the natural runoff regime. These actions would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, moderate to major, beneficial impact on hydrology.

Under Alternative 4, river access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable Merced River access points throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, and restore natural runoff processes. This would be expected to have a measurable effect on hydrology in the river, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 4, the Sugar Pine and Ahwahnee bridges and associated berms would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. These sites would have reduced scour and more stable riverbanks, thus reducing the amount of fine sediment in the river. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 4, all campsites and associated infrastructure within the 100-year floodplain would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, and tent-style lodging at Housekeeping Camp. Other facilities that would be removed from the 100-year floodplain include the select Yosemite Lodge infrastructure. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Methods for restoration would include recontouring, ditch removal, and decompaction. Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil, as decompaction occurs, with an excavator or dozer with winged rippers. Earth-moving activities during construction have the potential to mobilize fine sediment, which would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce this impact to negligible. After construction, restored areas would result in established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 4, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** Removal of the Sugar Pine and Ahwahnee bridges and associated berms would reduce constrictions in the Merced River and would reduce water surface elevations during floods, resulting in a local, long-term, minor, beneficial impact on floodplains.

**Restoration.** Restoration of areas within the 100-year floodplain, including locations at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, former Upper River and Lower River campgrounds, Housekeeping Camp, and Yosemite Lodge. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows, which would increase connectivity between the Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Proposed biological resource actions associated with Alternative 4 that would be deployed along Segment 2 include removal or realignment of Northside Drive and bike path would not occur, improve hydrologic connectivity along both sides of the road, and remove fill and replace with a boardwalk at Ahwahnee Meadow; restoration 1,335 feet of Southside Drive and road realignment at Stoneman Meadow, and application of engineering solutions to promote water flow at the Orchard Parking Lot, with installation of up to 275 feet of boardwalk at Curry Village; restoration of 16.5 acres of floodplain including decompaction of soils and removal of asphalt, former roads, and campsites, re-establishment of filled channels, placement of large box culverts under road to all water flow, close riparian zone to prevent trampling at former Upper and Lower Rivers Campground; restoration of 12 acres of riparian habitat at North Pines Campgrounds; designate access points using boardwalks and viewing platforms, restore informal trails at El Capitan meadow; restoration of 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged after the 1997 flood and subsequently removed), remove fill, decompact soils, and plant riparian plant species.

Rerouting and consolidation of trails, restoration of road areas and meadows, restoration of floodplain, decompaction, and removal of informal trails could contribute to increased stormwater infiltration capacity and increased storm event hydrologic concentration times. Restoration of riparian and floodplain vegetation would generally slow floodwaters in the vicinity of the restored area, more closely mimicking natural conditions, resulting in a local, long-term, minor, beneficial impact to hydrology and flooding.

Relocation and removal of facilities located in floodplain areas, including removal of existing fill, removal of campsites, removal of informal trails, relocation of paths, and other proposed facility realignments would reduce existing constraints on the natural floodplain of the river. Reductions in these constraints would reduce existing interference within the floodplain. Installation of large box culverts and restoration of filled channels would also support floodplain function. Therefore, this is considered a segment-wide, long-term, minor, beneficial impact with respect to flooding.

Implementation of engineering solutions to promote water flow at the Orchard Parking Lot would alleviate existing stormwater/flood related constrictions at the parking lot. This would result in a local, long-term, minor, beneficial impact on flooding.

Construction of the proposed biological resources actions could result in temporary disturbance to surface sediments and vegetation. Disturbance would result primarily from the use of heavy machinery. Heavy machinery would be used for soil decompaction, removal and relocation of asphalt areas, recontouring of topography, rerouting of trails, removal of informal trails, and removal of other infrastructure as noted previously. Minimal additional disturbance could occur during restoration activities and boardwalk installation, due to localized disturbance. Additionally, construction related use of heavy machinery could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants, during the construction process. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions that would occur under Alternative 4 along Segment 2 include movement of the unimproved parking area at Camp 6 north by approximately 150 feet away from the ordinary high water mark, and restore riparian habitat along the river; removal of two bridges including Sugar Pine Bridge and Ahwahnee Bridge and the associated road berms, including rerouting of trails and utilities, and redesign of affected roadways and intersections; placement of large wood, brush layering, and an engineered log jam so as to reduce the effects of Stoneman Bridge on hydrology and flooding characteristics of the river; install culverts along Northside Drive to improve drainage.

Stoneman Bridge, Sugar Pine Bridge, and Ahwahnee Bridge currently cause hydrologic constrictions along the Merced River. During moderate flow conditions, constrictions associated with these bridges interferes with natural hydrologic processes along the river, including reduction of channel migration, alteration of scour, and other hydrologic alterations. During high and flood flows, the bridges constrict flood flows, resulting in backup of flows behind the bridges, increases in flow velocity and scour in the vicinity of the bridges, and reduction in flows downstream of the bridges, in comparison to natural conditions. Therefore, removal of the Sugar Pine and Ahwahnee Bridges would alleviate these conditions in localized areas. Installation of the proposed large wood, brush layering, and engineered log jam would reduce the deleterious effects of Stoneman Bridge on the hydrology and flooding characteristics of the Merced River in its vicinity, but would not completely alleviate the existing constriction. Therefore, implementation of these actions would result in a local, long-term, moderate, beneficial impact on hydrology and flooding.

Installation of the proposed culverts along Northside Drive would reduce existing stormwater drainage issues in that area, thereby reducing localized flooding conditions during major storm events. This would result in a net improvement with respect to flooding, and is considered a local, long-term, minor, beneficial impact on flooding.

Moving the unimproved parking area at Camp 6 north and away from the ordinary high water mark of the river would result in the removal of existing structures that interfere with floodplain function. Removal of these structures would thereby reduce existing obstructions within the floodplain, and would thereby result in a net local, long-term, minor, beneficial impact on flooding.

Removal of the various trails, berms, roadways, and intersections associated with the proposed bridge removals and the Camp 6 actions would represent the removal of existing obstructions within the floodway corridor of the Merced River. Removal of these features would contribute to a return towards natural flood stage hydrologic processes in the vicinity of these existing features, by removing floodplain obstructions from the 10-year floodplain. Therefore, these proposed actions would result in a local, long-term, minor, beneficial impact on flooding.

With respect to water quality, during construction, removal of the two bridges and other infrastructure from the Merced River and its floodplain, placement of logjams and other infrastructure near Stoneman Bridge, and associated restoration activities, would result in temporary construction related impacts to water quality. These could include incidental releases of sediment into natural waterways and the Merced River. Additionally, the use of heavy construction equipment during bridge removal could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants during the construction period. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, temporary, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Under Alternative 4, visitor-serving facilities and overall use would be reduced, including in riverside areas, thereby decreasing trampling, informal trail development, and riverbank erosion. While number of campsites would increase, employee housing and overnight lodging would decrease. In addition, informal parking would also be reduced. These actions would have a net reduction in total impervious surface area, allowing soils and vegetation to recover, and lead to increased infiltration of runoff, reduced riverbank erosion, and increased streamflow dynamics. This would be expected to have a measurable effect on hydrology, but would not be expected to have an overall effect on the character of the Merced River, thus resulting in a segmentwide, long term, minor, beneficial impact on hydrology.



Temporary housing in the Lost Arrow parking lot would be removed and permanent housing constructed, resulting in no net change in impervious surface area. This action would not affect hydrology.

Removal of trails and formalizing picnic areas would increase infiltration of runoff, restore riparian vegetation, and restore a more natural hydrologic regime. Formalizing Merced River access points and trails would reduce vegetation trampling. This would be expected to have a measurable effect on hydrology in the river, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 4, total visitation, residential and visitor serving facilities, and parking within the Valley would be reduced. These actions would reduce trampling of riparian vegetation, informal trail development, and riverbank erosion. Despite the increase in campsites, the overall reduction in facilities and informal parking would reduce impervious surface area, allow soils and vegetation to recover, and improve infiltration. With the number vehicles entering the Valley reduced, the concentration of vehicle-associated pollutants in stormwater runoff would also decrease. This would be expected to lead to a detectable reduction in fine sediment and pollutants, resulting in a segmentwide, long-term, minor, beneficial impact on water quality.

New parking areas located at the West of Yosemite Lodge parking and parking areas moved at Camp 6 would generate discharges of sediment and automobile related pollutants into stormwater. Release of these pollutants could result in negligible degradation of water quality downstream, and these actions constitute a local, long-term, negligible, adverse impact on water quality.

Removal of trails and formalizing picnic areas would restore riparian vegetation and reduce erosion. Formalizing Merced River access points and trails would also reduce vegetation trampling and help to stabilize riverbanks. This would be expected to result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** Under Alternative 4, existing development would be removed from the floodplain in several areas (see *Impacts of Actions to Protect and Enhance River Values*, above). The park would construct new campgrounds at the former Upper and Lower Rivers campgrounds, Upper Pines Campground, and install new RV camping facilities west of Yosemite Lodge. While these facilities would be constructed more than 150 feet from the river's ordinary high water mark, they would remain within the 100-year floodplain. The presence of such facilities would not be expected to substantially impact flood flows. Nonetheless, the presence of these campgrounds within the 100-year floodplain would make them susceptible to periodic flooding. The resulting floodplain impact would be local, long-term, negligible, and adverse.

**Curry Village & Campground.** Actions to manage user capacities, land use, and facilities in this area would include a reduction in total units from 400 existing units to 355 units. Total lodging within this area would consist of 290 tent-style lodging units retained in Curry Village, 18 units retained at Stoneman House, and 47 cabin-with-bath units retained in Curry Village. At Boys Town, Southside Drive would be re-routed and a 40-site campground would be constructed.

Removal of approximately 45 existing units and installation of new campgrounds would result in negligible increases in impervious surfaces associated with facilities and access areas. The re-routing of Southside Drive would result in essentially no net change in total impervious surface area. Impervious surfaces increase stormwater discharge volumes and shorten hydrologic concentration time. Therefore, a local, long-term, negligible, adverse impact to hydrology would result from these actions.

Removal of the existing units, installation of new units, and rerouting/construction associated with Southside Drive could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy construction related equipment, as warranted, would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The existing and proposed facilities would be located outside of the 100-year floodplain and therefore would not interfere with floodplain characteristics or flood flows.

**Camp 6 and Yosemite Village.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 primarily concern transportation improvements. Proposed projects would involve improvements to intersection function at Village Drive and Northside Drive near Camp 6, including construction of a pedestrian underpass to alleviate traffic congestion; installation of a three-way intersection at Sentinel Drive and the entrance to the parking area; relocation and redevelopment of the existing overflow parking area west of Yosemite Lodge to provide 150 additional parking spaces; and relocation of Camp 6 day use parking area north by 150 feet in order to facilitate riparian restoration (restoration actions evaluated above). The Camp 6/Village Center parking area would be increased to 750 units by redeveloping part of the current administrative footprint in that area. One hundred parking spaces would be added to the Yosemite Village parking area. The existing tour bus drop off area would be relocated to the Highland Court area, in order to provide 3 additional loading and unloading spaces. The Highland Court area is currently used for the placement of temporary housing in the existing parking lot, following the 1997 flood.

Installation of new parking areas, roadways, intersection, and the pedestrian underpass would require the construction of new impervious surfaces. Net increases in impervious surface area would be largely offset by the removal of select existing parking facilities and roadways, as noted above, as well as improvements in drainage facilities associated with the new structures, and the addition of bioswales in parking areas. However, based on the anticipated increase in parking and road area, a net increase in impervious surfaces is anticipated. As noted elsewhere, impervious surfaces cause increased stormwater discharge and shorten hydrologic concentration time. This would result in a local, long-term, minor, adverse impact on stormwater hydrology. Relocation of the bus drop-off area and additional bus loading and unloading spaces would not result in a change in impervious surfaces, because the affected areas are already impervious.

Demolition of existing parking areas and roadways slated for removal, as well as construction of new parking areas, roads, and the pedestrian underpass and other activities discussed above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The use of the proposed new parking areas would serve to consolidate existing parking activities into formalized areas, reducing reliance on informal parking areas. Therefore, the anticipated increase in formalized parking spaces is not expected to result in increased use, but would accommodate existing use that currently relies on other facilities. Similarly, moving the existing bus stop to a new location would not represent a new or increased intensity of use. Therefore, no net change in water quality pollutants related to parking lots is anticipated, because existing effects would be consolidated into formalized parking areas.

The existing Camp 6 day use parking area is located within the 10-year floodplain. Parking lots do not generally constitute major obstructions to flood flows, and so their presence within a floodplain is generally less obstructive than other vertical development; although minor effects, such as localized interference with flood flows, could still occur during a flooding event. A parking lot in the floodplain does, however, remove floodplain vegetation and soils. This rougher natural surface slows floodwaters, filters suspended sediment, and buffers the impacts of flooding. Moving the existing facility by up to 150 feet could result in a negligible reduction in the area of parking lot that is located within the 10-year floodplain. However, the parking lot would remain within the 100-year floodplain and therefore continue to have a local, long-term, minor, adverse impact with respect to flooding.

**Yosemite Lodge and Camp 4.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 are limited to the replacement of the existing on-grade pedestrian crossing located west of the intersection of Northside Drive and Yosemite Lodge Drive with a pedestrian underpass. This action would be completed in order to alleviate pedestrian/vehicle conflicts.

Installation of an underpass would result in a slight expansion of the area of impervious facilities located on site, as compared to existing conditions. Because impervious surfaces increase stormwater runoff and peak runoff flows, the anticipated net increase in impervious surfaces would result in a local, long-term, negligible, adverse impact on hydrology.

Construction of the proposed underpass, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy excavation and construction related equipment would also disturb surface sediments within affected areas, could require stockpiling of spoils, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation

measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The facilities in question would be located outside of the existing floodplain, and therefore would not affect flooding.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, long-term, minor to moderate, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible to minor, beneficial impacts on hydrology and water quality, and a local, long-term, negligible, adverse impact on floodplains.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Oak protection, removal of fill, and decompaction of soils in the Odger's fuel storage area would promote infiltration in the area, but would not have a discernible effect on the hydrology of the river, thus resulting in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** Parking restrictions in the Odger's fuel storage area would result in established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Hydrology.** Construction of new housing in the Rancheria Flatt area of El Portal would involve vegetation removal, soils compaction, and increased areas of impervious surfaces outside the 100-year floodplain. These actions would have a local, long-term, minor, adverse impact on hydrology.

**Water Quality.** Construction of new housing and parking lots, as described above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have local, long-term, negligible, beneficial impact on the river's hydrology and water quality. Actions to manage visitor capacity, land use, and facilities would have a long-term, minor, adverse impact on hydrology.

## Segments 5, 6, 7, and 8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

**Hydrology.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas would result in a decrease of trampling and an increase in soil infiltration. Impervious surfaces would be reduced, leading to an increase in the infiltration capacity of the area, thereby restoring the hydrologic regime. This would be expected to have a measurable effect on hydrology in the South Fork Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas would result in reduced trampling and established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas would increase connectivity between the South Fork Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Along Segment 7 under Alternative 4, relocation of two stock use campground sites from sensitive biological resource areas to Wawona Stables would be the same as described for Alternative 2, and therefore would incur the same impacts as discussed for Alternative 2. Please refer to the discussion for Alternative 2.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** The removal of facilities under Alternative 4 would reduce the amount of impervious surfaces within the Segments 5, 6, 7, and 8, thereby leading to a more natural hydrologic regime, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on hydrology.

**Wawona.** Removal of 27 campsites from areas located within 150 feet of the river would reduce existing effects of trampling on riverbank areas, and would support reduced erosion rates within the area. This would result in a local, long-term, minor, beneficial impact on water quality due to reduced erosion rates. Similarly, removal of 27 campsites from within the existing floodplain would result in a net reduction in floodplain area that is impacted by existing facilities. Removal of these sites would result in a local, long-term, negligible, beneficial impact on floodplains and flooding. Finally, removal of the existing facilities would involve minimal demolition related activities, which could include the use of heavy machinery, as well as other minor restoration activities. These construction activities would require implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), which would ensure that potential water quality impacts would be local, short-term, negligible, and adverse.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segments 5-8 would have local, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains.

#### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

**Hydrology.** Actions associated with Alternative 4 would have long-term, minor to moderate, beneficial impacts on hydrology. Restoration actions associated with Alternative 4 would decompact soil and restore meadow and riparian areas. Actions associated with the removal of impervious surfaces would increase infiltration and partially restore the natural hydrologic regime in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the Merced River, thereby restoring hydrologic processes in a detectable manner.

**Water Quality.** Actions associated with Alternative 4 would have long-term, minor, beneficial impacts on water quality. Restoration actions associated with Alternatives 4 would restore denuded vegetation and limit informal trails, leading to a reduction in erosions. Actions associated with in-river restoration would help to stabilize eroded areas, thereby reducing fine sediment in a detectable manner. Construction activities associated with restoration have the potential to adversely affect water quality over the short term, but would be mitigated to a negligible level by instituting measure MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C).

**Floodplains.** Actions associated with Alternative 4 would have long-term, negligible to minor, beneficial and adverse impacts on floodplains. Restoration actions associated with Alternative 4 would reconnect the Merced River and its floodplain in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the river, partially reconnecting the river to its floodplain, and creating a long-term, negligible, beneficial impact on 100-year floodplains.

#### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The cumulative impacts analysis for Alternative 2 reflects the historic timeframe for installation of the various past, present, and reasonably foreseeable future actions listed below. The spatial dimension for the cumulative impacts analysis encompasses the portion of the Merced River watershed that is located within the park. The cumulatively considerable projects for Alternative 2 would be the same as those presented in Alternative 1.

#### ***Overall Cumulative Impact Common for Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

Under this alternative, removal of riprap, removal of two bridges and unnecessary infrastructure, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water

quality. This would contribute to local, long-term, moderate, beneficial cumulative impacts on hydrology and floodplains, and local, long-term, minor to moderate, beneficial impacts on water quality.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Pack stock used for administrative purposes would graze on meadow vegetation near the Merced Lake Ranger Station in accordance with established grazing capacities. This would help protect meadow vegetation, which in turn would produce a more natural hydrologic regime. This would result in a local, long-term, negligible, beneficial impact on hydrology.

The reduction in capacity at Merced Lake High Sierra Camp would slightly reduce the amount of localized vegetation trampling, leading to an increase in the ability of the soil to infiltrate runoff. This action would not be expected to create a measurable change in hydrology in the Merced River and would result in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** The reduction in capacity at Merced Lake High Sierra Camp would slightly reduce the amount of localized vegetation trampling, leading to a decrease in erosion. This action would not be expected to create a measurable change in hydrology in the Merced River and would result in a local, long-term, negligible, beneficial impact on water quality.

**Merced Lake High Sierra Camp.** Under alternative 5, the Merced Lake High Sierra Camp would be reduced in size to 11 units (42 beds), and existing flush toilets would be replaced with composting toilets.

With respect to hydrologic resources, removal of select existing facilities would result in a negligible net reduction in impervious surfaces on site. This would provide a negligible benefit to hydrology, because impervious surfaces prevent the natural infiltration of stormwater during storm events, resulting in increased runoff and other effects on stormwater hydrology. Total impervious surfaces removed would be less than one quarter of an acre. Therefore, potential impacts on hydrology associated with this action are considered to be local, long-term, negligible, and beneficial.

Removal of existing facilities and restoration of the area to natural conditions could result in negligible disturbance during facility removal. These activities could generate very localized and temporary increases in erosion and sedimentation in affected areas. However, these effects would be limited to the construction period, and would be minimal to negligible in extent. With implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), potential water quality related impacts would be a local, temporary, negligible, and adverse.



Removal of 11 High Sierra Camp units would lessen impacts on water quality, hydrology, and flooding as compared to those of Alternative 1 (No Action). Impervious surfaces would be reduced, as would potential sources of water quality pollutants, and no potential floodplain obstructions would be installed. The resulting impacts would be local, long-term, negligible, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would result in a local, short-term and long-term, negligible, beneficial impact on hydrology.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Under Alternative 5, the Sugar Pine Bridge would be removed and restored to natural conditions. This action would have an appreciable effect on streamflow dynamics, allowing natural processes to prevail. Backwaters, rapid scour, and excessive sediment deposition upstream and downstream of bridges would be reduced. The removal of hard points associated with these bridges would promote channel migration and partially restore natural channel evolution. This action would improve hydrology in a clearly detectable manner and result in a local, long-term, moderate to major, beneficial impact on hydrology.

The placement of large wood and constructed logjams (including large trees with root wads) to mitigate the effects of the Stoneman and Ahwahnee bridges would add complexity by creating scour around the large wood area and deflecting flows. Depths would be deeper in the reduced area of the Merced River channel. This would have a slightly detectable impact on river dynamics, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

Under Alternative 5, all campsites and associated infrastructure within 100 feet of the ordinary high-water mark of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, and tent-style lodging units at Housekeeping Camp. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Restoration actions would result in the restoration of approximately 182 acres of meadow, riparian, and other habitat types. The amount of impervious surface in restored areas would be reduced, increasing infiltration of runoff and restoring a more natural hydrologic regime. Removing infrastructure, including road prisms and ditches, would reconnect surface and groundwater within each meadow. Replanting restored areas with native vegetation would restore the natural runoff regime. These actions would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, moderate to major, long-term, beneficial impact on hydrology.

Under Alternative 5, river access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable Merced River access points throughout the segment, and areas of compacted soils would be decompacted and restored. These

actions would improve bank stability at river access points, and restore natural runoff processes. This would be expected to have a measurable effect on hydrology in the river, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 5, the Sugar Pine Bridge would be removed and restored to natural conditions. The multi-use trail on Sugar Pine and Ahwahnee bridges would be rerouted along the north bank of the Merced River. These sites would have reduced scour and more stable riverbanks, thus reducing the amount of fine sediment in the river. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 5, all campsites and associated infrastructure within 100 feet of the ordinary high-water mark of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, and tent-style lodging units at Housekeeping Camp. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Methods for restoration would include recontouring, ditch removal, and decompaction. Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil as decompaction occurs, using an excavator or dozer with winged rippers. Earth-moving activities during construction have the potential to mobilize fine sediment, which would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce this impact to negligible. After construction, restored areas would result in established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 5, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at Merced River access points, thus reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** Removal of the Sugar Pine Bridge would reduce constrictions in the Merced River and would reduce water surface elevations during floods, resulting in a local, long-term, minor, beneficial impact on floodplains.

The placement of large wood and constructed logjams (including large trees with root wads) at the bases of Ahwahnee and Stoneman bridges would increase roughness in the Merced River, allowing it to reconnect to its floodplain during moderate flows, though not in a manner that would have a substantial effect on the character of the river. This would result in a local, long-term, minor, beneficial impact on floodplains. During higher flows, this action could increase 100-year water surface elevations, though in a manner that would be minimally detectable, and would result in a local, long-term, minor, beneficial impact on floodplains and infrastructure located in floodplains.

Restoration of areas within the 150-foot Merced River buffer, including locations at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, former Upper River and Lower River campgrounds, Housekeeping Camp, the Curry Orchard parking lot, and Yosemite Lodge. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows, which would increase connectivity between the Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Proposed biological resource actions associated with Alternative 5 that would be deployed along Segment 2 include replacement of a trail with boardwalk, removal or realignment of Northside Drive and bike path would not occur, improve hydrologic connectivity along both sides of the road by installing culverts, and remove fill and replace with a boardwalk at Ahwahnee Meadow; and application of redesign and engineering solutions to promote water flow at the Orchard Parking Lot, with installation of up to 275 feet of boardwalk at Curry Village; restoration of 16.5 acres of floodplain including decompaction of soils and removal of asphalt, former roads, and campsites, re-establishment of filled channels, placement of large box culverts under road to all water flow, close riparian zone to prevent trampling at former Upper and Lower Rivers Campground; removal of all campsites and infrastructure within a 100 foot buffer of the river along Valley campgrounds with restoration of 6.5 acres of riparian habitat; designate access points using boardwalks and viewing platforms, restore informal trails at El Capitan meadow; restoration of 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged after the 1997 flood and subsequently removed), remove fill, decompact soils, and plant riparian plant species.

Rerouting and consolidation of trails, restoration of road areas and meadows, restoration of floodplain, decompaction, and removal of informal trails could contribute to increased stormwater infiltration capacity and increased storm event hydrologic concentration times. Restoration of riparian and floodplain vegetation would generally slow floodwaters in the vicinity of the restored area, more closely mimicking natural conditions, resulting in a local, long-term, minor, beneficial impact to hydrology and flooding.

Relocation and removal of facilities located in floodplain areas, including removal of existing fill, removal of campsites, removal of informal trails, relocation of paths, and other proposed facility realignments would reduce existing constraints on the natural floodplain of the river. Reductions in these constraints would reduce existing interference within the floodplain. Installation of culverts would also support floodplain function and minimize ponding in inappropriate areas. Therefore, this is considered a segment-wide, long-term, minor, beneficial impact with respect to flooding.

Implementation of engineering solutions to promote water flow at the Orchard Parking Lot would alleviate existing stormwater/flood related constrictions at the parking lot. This would result in a local, long-term, minor, beneficial impact on flooding.

Construction of the proposed biological resources actions could result in temporary disturbance to surface sediments and vegetation. Disturbance would result primarily from the use of heavy machinery. Heavy machinery would be used for soil decompaction, removal and relocation of asphalt areas, recontouring of topography, rerouting of trails, removal of informal trails, and removal of other infrastructure as noted previously. Minimal additional disturbance could occur during restoration activities and boardwalk installation, due to localized disturbance. Additionally, construction related use of heavy machinery could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants, during the construction process. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions that would occur under Alternative 5 along Segment 2 include movement of the unimproved parking area at Camp 6 north by approximately 150 feet away from the ordinary high water mark and restoration of riparian habitat along the river; removal of the Sugar Pine Bridge and berm, at Ahwahnee Bridge, connection of a trail and small bridge over the cut-off channel, and rerouting of trails to the north bank of the river; placement of large wood, brush layering, and an engineered log jam so as to reduce the effects of Stoneman Bridge on hydrology and flooding characteristics of the river; install culverts along Northside Drive to improve drainage.

Stoneman Bridge, Sugar Pine Bridge, and Ahwahnee Bridge currently cause hydrologic constrictions along the Merced River. During moderate flow conditions, constrictions associated with these bridges interferes with natural hydrologic processes along the river, including reduction of channel migration, alteration of scour, and other hydrologic alterations. During high and flood flows, the bridges constrict flood flows, resulting in backup of flows behind the bridges, increases in flow velocity and scour in the vicinity of the bridges, and reduction in flows downstream of the bridges, in comparison to natural conditions. Therefore, removal of Sugar Pine Bridge would alleviate these conditions in localized areas. Trail connections and realignments at Ahwahnee Bridge would alleviate existing interference that these structure exhibit within the Merced River, but would not directly address constriction associated with Ahwahnee Bridge. Installation of the proposed large wood, brush layering, and engineered log jam would reduce the deleterious effects of Stoneman Bridge on the hydrology and flooding characteristics of the Merced River in its vicinity, but would not completely alleviate the existing constriction. Therefore, implementation of these actions would result in a local, long-term, moderate, beneficial impact on hydrology and flooding.

Installation of the proposed culverts along Northside Drive would reduce existing stormwater drainage issues in that area, thereby reducing localized flooding conditions during major storm events. This would result in a net improvement with respect to flooding, and is considered a local, long-term, minor, beneficial impact on flooding.

Moving the unimproved parking area at Camp 6 north and away from the ordinary high water mark of the river would result in the removal of existing structures that interfere with floodplain function. Removal of these structures would thereby reduce existing obstructions within the floodplain, and would thereby result in a net local, long-term, minor, beneficial impact on flooding.

Removal of the various trails, berms, roadways, and intersections associated with the proposed bridge removals and the Camp 6 actions would represent the removal of existing obstructions within the floodway corridor of the Merced River. Removal of these features would contribute to a return towards natural flood stage hydrologic processes in the vicinity of these existing features, by removing floodplain obstructions from the 10-year floodplain. Therefore, these proposed actions would result in a local, long-term, minor, beneficial impact on flooding.

With respect to water quality, during construction, removal of one bridges and other infrastructure from the Merced River and its floodplain, placement of logjams and other infrastructure near Stoneman Bridge, trail realignments and connections, and associated restoration activities, would result in temporary construction related impacts to water quality. These could include incidental releases of sediment into natural waterways and the Merced River. Additionally, the use of heavy construction equipment during bridge removal could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants during the construction period. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, temporary, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Under Alternative 5, overall visitor use would be slightly reduced, including in riverside areas, thereby decreasing trampling, informal trail development, and riverbank erosion. While number of campsites and lodging units would increase, employee housing would decrease. In addition, informal parking would also be reduced. These actions would cause a marginal reduction in total impervious surface area, allowing soils and vegetation to recover, and lead to increased infiltration of runoff, reduced riverbank erosion, and increased streamflow dynamics. This would be expected to have a measurable effect on hydrology, but would not be expected to have an overall effect on the character of the Merced River thus resulting in a segmentwide, long-term, beneficial, minor impact on hydrology.

Temporary housing in the Lost Arrow parking lot would be removed and permanent housing constructed, resulting in no net change in impervious surface area. This action would not affect hydrology.

Removal of trails and formalizing picnic areas would increase infiltration of runoff, restore riparian vegetation, and restore a more natural hydrologic regime. Formalizing Merced River access points and trails would reduce vegetation trampling. This would be expected to have a measurable effect on hydrology in the river, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 5, total visitation and residential development would be reduced, while parking, camping, and lodging facilities would be increased. Overall, these actions would reduce trampling of riparian vegetation, informal trail development, and riverbank erosion. Removal of housing and informal parking would slightly reduce impervious surface area, allow soils and vegetation to recover, and improve infiltration. With the number vehicles entering the Valley slightly increased, potential for vehicle-associated pollutants to be picked up by stormwater runoff would also increase. The net effect of these actions would be a detectable reduction in fine sediment and pollutants entering the Merced River, resulting in a segmentwide, long-term, minor, beneficial impact on water quality.

New/expanded parking areas west of Yosemite Lodge and Camp 6 would generate discharges of sediment and automobile related pollutants into stormwater. Release of these pollutants could result in minor degradation of water quality downstream, and these actions constitute a local, long-term, minor, adverse impact on water quality.

Removal of trails and formalizing picnic areas would restore riparian vegetation and reduce erosion. Formalizing Merced River access points and trails would also reduce vegetation trampling and help to stabilize riverbanks. This would be expected to result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** Under Alternative 5, existing development would be removed from the floodplain in several areas (see *Impacts of Actions to Protect and Enhance River Values*, above). The park would construct new campgrounds at the former Upper River and Upper Pines campgrounds, while allowing Lower River Campground to passively restore. New campground facilities would be constructed more than 150 feet from the river's ordinary high water mark; however, they would remain within the 100-year floodplain. The presence of such facilities would not be expected to substantially impact flood flows. Nonetheless, the presence of new campgrounds within the 100-year floodplain would make them susceptible to periodic flooding. The resulting floodplain impact would be local, long-term, negligible, and adverse.

**Curry Village & Campground.** Actions to manage user capacities, land use, and facilities in this area would include an increase in total units from 400 existing units to 453 units. Total lodging units would consist of 290 tent-style lodging units retained in Curry Village, 98 newly constructed hard-sided units in Boys Town, 18 units retained at Stoneman House, and 47 cabin-with-bath units retained in Curry Village.

Installation of the new units in Boys Town would require the addition of new impervious surfaces, and a net increase in total impervious surface area would be anticipated within this area. As noted

elsewhere, impervious surfaces increase stormwater runoff and shorten hydrologic concentration time. New impervious surfaces would be limited to facility footprints, and some additional access areas. Because new impervious surface areas would be limited in extent, these actions would result in a local, long-term, negligible, adverse impact on stormwater hydrology.

Construction of the proposed new units could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy construction equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The existing and proposed facilities would be located outside of the 100-year floodplain and therefore would not interfere with floodplain characteristics or flood flows.

**Camp 6 and Yosemite Village.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 primarily concern transportation improvements. Proposed projects would involve improvements to intersection function at Village Drive and Northside Drive near Camp 6, including a traffic circle to alleviate traffic congestion; realignment of Northside Drive to the south of the Yosemite Village Day-Use Parking Area; consolidation of parking north of the road; redevelopment of the existing overflow parking area west of Yosemite Lodge to provide 300 additional parking spaces; relocation of Camp 6 day use parking area north by 150 feet in order to facilitate riparian restoration (restoration actions evaluated above); and installation of a three-way intersection at Sentinel Drive and the entrance to the parking area. The Camp 6/Village Center parking area would be increased to 750 units by redeveloping part of the current administrative footprint in that area. One hundred parking spaces would be added to the Yosemite Village parking area. The existing tour bus drop off area would replace temporary housing at Highland Court.

Installation of new parking areas, roadways, traffic circle, intersections, and realignment of roadways would require the construction of new impervious surfaces. Net increases in impervious surface area would be largely offset by the removal of select existing parking facilities and roadways, as noted above, as well as improvements in drainage facilities associated with the new structures, and the addition of bioswales in parking areas. However, based on the anticipated increase in parking and road area, a net increase in impervious surfaces is anticipated. As noted elsewhere, impervious surfaces increase stormwater runoff and a shorten hydrologic concentration time. The proposed actions would therefore result in a local, long-term, minor, adverse impact on stormwater hydrology. Relocation of the bus drop off area and additional bus loading and unloading spaces would not result in a change in impervious surfaces, because the affected areas are already impervious.

Demolition of existing parking areas and roadways slated for removal, as well as construction of new parking areas, roads, and the pedestrian underpass/ other activities discussed above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb



surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The use of the proposed new parking areas would serve to consolidate existing parking activities into formalized areas, reducing reliance on informal parking areas. Therefore, the anticipated increase in formalized parking spaces is not expected to result in increased use, but would accommodate existing use that currently relies on other facilities. Similarly, moving the existing bus stop to a new location would not represent a new or increased intensity of use. Therefore, no net change in water quality pollutants related to parking lots would be anticipated, because existing effects would be consolidated into formalized parking areas.

The existing Camp 6 day use parking area is located within the 10-year floodplain. Parking lots do not generally constitute major obstructions to flood flows, and so their presence within a floodplain is generally less obstructive than other vertical development; although minor effects, such as localized interference with flood flows, could still occur during a flooding event. A parking lot in the floodplain does, however, remove floodplain vegetation and soils. This rougher natural surface slows floodwaters, filters suspended sediment, and buffers the impacts of flooding. Moving the existing facility by up to 150 feet could result in a negligible reduction in the area of parking lot that is located within the 10-year floodplain. However, the parking lot would remain within the 100-year floodplain and therefore continue to have a local, long-term, minor, adverse impact with respect to flooding.

**Yosemite Lodge and Camp 4.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 are limited to the replacement of the existing on-grade pedestrian crossing located west of the intersection of Northside Drive and Yosemite Lodge Drive with a pedestrian underpass. This action would be completed in order to alleviate pedestrian/vehicle conflicts.

Installation of an underpass would result in a slight expansion of the area of impervious facilities located on site, as compared with that of existing conditions. Because impervious surfaces increase stormwater runoff and peak runoff flows, the anticipated net increase in impervious surfaces would result in a local, long-term, negligible, adverse impact on hydrology.

Construction of the proposed underpass could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy excavation and construction related equipment would also disturb surface sediments within affected areas, could require stockpiling of spoils, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The facilities in question would be located outside of the existing floodplain, and therefore would not affect flooding.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, long-term, minor to moderate, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible, beneficial impacts on hydrology and water quality, and a local, long-term, negligible, adverse impact on floodplains.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

**Hydrology.** Oak protection, removal of fill, and decompaction of soils in the Odger's fuel storage area would promote infiltration in the area, but would not have a discernible effect on the hydrology of the Merced River, thus resulting in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** Parking restrictions in the Odger's fuel storage area would result in established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

**Hydrology.** Construction of new housing in the Rancheria Flatt area of El Portal would involve vegetation removal, soils compaction, and increased areas of impervious surfaces outside the 100-year floodplain. These actions would have a local, long-term, minor, adverse impact on hydrology.

**Water Quality.** Construction of new housing and parking lots, as described above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have local, long-term, negligible, beneficial impact on the river's hydrology and water quality. Actions to manage visitor capacity, land use, and facilities would have a long-term, minor, adverse impact on hydrology.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** Along Segment 7 under Alternative 5, relocation of two stock use campground sites from sensitive biological resource areas to the Wawona Maintenance Yard area

would be the same as described for Alternative 2, except that the facility would be relocated to a slightly different area. Therefore, Alternative 5 would incur the same impacts as discussed for Alternative 2. Please refer to the discussion for Alternative 2.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** The removal of facilities under Alternative 5 would reduce the amount of impervious surfaces within Segments 5, 6, 7, and 8, leading to a more natural hydrologic regime, though not to a measurable extent. This would result in a local, beneficial, negligible, long-term impact on hydrology.

**Wawona.** Removal of 13 campsites from areas located within 100 feet of the river would reduce existing effects of trampling on riverbank areas, and would support reduced erosion rates within the area. This would result in a local, long-term, negligible to minor, beneficial impact on water quality due to reduced erosion rates. Similarly, removal of 13 campsites from within the existing floodplain would result in a net reduction in floodplain area that is impacted by existing facilities. Removal of these sites would result in a local, long-term, negligible, beneficial impact on floodplains and flooding. Finally, removal of the existing facilities would involve minimal demolition related activities, which could include the use of heavy machinery, as well as other minor restoration activities. These construction activities would require implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), which would ensure that potential water quality impacts would be local, short-term, negligible, and adverse.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segments 5-8 would have local, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible, beneficial impacts on hydrology, water quality, and floodplains.

**Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

**Hydrology.** Actions associated with Alternative 5 would have long-term, negligible to minor, beneficial impacts on hydrology. Restoration actions associated with Alternative 5 would decompact soil and restore meadow and riparian areas. Actions associated with the removal of impervious surfaces would increase infiltration and partially restore the natural hydrologic regime in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the Merced River, thereby restoring hydrologic processes in a detectable manner.

**Water Quality.** Actions associated with Alternative 5 would have long-term, minor, beneficial impacts on water quality. Restoration actions associated with Alternative 5 would restore denuded vegetation and limit informal trails, leading to a reduction in erosions. Actions associated with in-river restoration would help to stabilize eroded areas, thereby reducing fine sediment in a detectable manner. Construction activities associated with restoration have the potential to adversely affect water quality over the short term, but would be mitigated to a negligible level by instituting measure MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C).

**Floodplains.** Actions associated with Alternative 5 would have long-term, negligible to minor, beneficial and adverse impacts on floodplains. Restoration actions associated with Alternatives 2–6 would reconnect the Merced River and its floodplain in a detectable manner, resulting in a long-term, minor, beneficial impact on floodplains. Actions associated with in-river restoration would add roughness and complexity to the river, partially reconnecting the river to its floodplain, and creating a long-term, negligible, beneficial impact on 100-year floodplains.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The cumulative impacts analysis for Alternative 2 reflects the historic timeframe for installation of the various past, present, and reasonably foreseeable future actions listed below. The spatial dimension for the cumulative impacts analysis encompasses the portion of the Merced River watershed that is located within the park. The cumulatively considerable projects for Alternative 5 would be the same as those presented in Alternative 1.

#### ***Overall Cumulative Impact Common for Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

Under Alternative 5, removal of riprap, removal of one bridge and unnecessary infrastructure, installation of logjams and other hydrology-enhancing actions, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, moderate, beneficial cumulative impacts on hydrology and floodplains, and local, long-term, minor, beneficial cumulative impacts on water quality.

#### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** Pack stock used for administrative purposes would graze on meadow vegetation near the Merced Lake Ranger Station in accordance with established grazing capacities. This would help protect meadow vegetation, which in turn would produce a more natural hydrologic regime. This would result in a local, long-term, negligible, beneficial impact on hydrology.

The continuation of current levels of visitor use and concentrated camping has the potential to increase informal trails and vegetation trampling, which reduce the ability of the soil to infiltrate runoff. This action would not be expected to create a measurable change in hydrology in the Merced River and would result in a local, long-term, negligible, adverse impact on hydrology.

**Water Quality.** The continuation of current levels of visitor use and concentrated camping has the potential to increase informal trails and vegetation trampling. This would increase the potential for

erosion, but would not be expected to cause detectable change in Merced River water quality, thus resulting in a local, long-term, negligible, adverse impact on water quality.

**Merced Lake High Sierra Camp.** Under Alternative 6, all existing units would remain, but existing flush toilets would be replaced with composting toilets. The proposed changes would not result in any construction related effects on hydrology or water quality. Installation of composting toilets would not expand the footprint of existing facilities, and would not result in noticeable construction period disturbance. Use of composting toilets rather than the existing flush toilets would result in a local, long-term, negligible, beneficial impact on groundwater quality. No other appreciable hydrologic resources impacts would occur.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would result in a local, long-term, negligible, adverse impact on hydrology. These actions would also have a local, long-term, negligible, adverse and beneficial impact on water quality.

## **Segment 2: Yosemite Valley**

### *Impacts of Actions to Protect and Enhance River Values*

**Hydrology.** Under Alternative 6, the hydraulic effects of bridges would be mitigated by the placement of large wood and constructed logjams (including large trees with root wads). This action would add complexity by creating scour around the large wood area and deflecting flows. Depths would be deeper in the reduced area of the Merced River channel. This would have a slightly detectable impact on river dynamics, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

Under Alternative 6, all campsites and associated infrastructure within 100 feet of the ordinary high-water mark of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, and tent-style lodging units at Housekeeping Camp. Other facilities that would be removed from the 100-year floodplain include select Yosemite Lodge infrastructure. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows.

Restoration actions would result in the restoration of approximately 156 acres of meadow, riparian, and other habitat types. The amount of impervious surface in restored areas would be reduced, increasing infiltration of runoff and restoring a more natural hydrologic regime. Removing infrastructure, including road prisms and ditches, would reconnect surface and groundwater within each meadow. Replanting restored areas with native vegetation would restore the natural runoff regime. These actions would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, moderate to major, beneficial impact on hydrology.

Under Alternative 6, Merced River access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable river access points

throughout Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, and restore natural runoff processes. This would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river, thus resulting in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** Under Alternative 6, all campsites and associated infrastructure within 100 feet of the ordinary high-water mark of the Merced River would be removed and restored to natural conditions. This would include campsites at Backpackers Camp, North Pines and Upper Pines campgrounds, Lower Pines and Yellow Pines Campgrounds, and tent-style lodging units at Housekeeping Camp. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows. Methods for restoration would include recontouring, ditch removal, and decompaction. Recontouring would involve use of a skid steer, loader, excavator, dozer, and dump truck to remove excavated material from the site. An excavator or dozer could be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer could push soils and material down the slope of the bank to create a gentler slope, which would increase revegetation success. Whenever possible, native fill would be used from the restoration site. Where possible, ditches would be contoured and leveled using fill material already present in associated berms. Soil decompaction would involve breaking up soils either manually, by using special decompaction tools, or with heavy equipment that can support ripping tines, such as excavators, skid steer, and dozers. Small pockets of fill would at times be blended into the soil as decompaction occurs, using an excavator or dozer with winged rippers. Earth-moving activities during construction have the potential to mobilize fine sediment, which would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce this impact to negligible. After construction, restored areas would result in established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

Under Alternative 6, river access would be more formalized, leading to a reduction in streambank erosion and soil compaction. Visitors would be directed to more stable Merced River access points throughout the Segment 2, and areas of compacted soils would be decompacted and restored. This would improve bank stability at river access points, thus reducing erosion, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** The placement of large wood and constructed logjams (including large trees with root wads) along the bases of Ahwahnee, Sugar Pine, and Stoneman bridges would increase roughness in the Merced River, allowing it to reconnect to its floodplain during moderate flows, though not in a manner that would have a substantial effect on the character of the river. This would result in a local, long-term, minor, beneficial impact on floodplains. During higher flows, this action could increase 100-year water surface elevations, though in a manner that would be minimally detectable, and would result in a local, long-term, minor, beneficial impact on floodplains and infrastructure located in floodplains.

**Restoration.** Restoration of areas within the 100-foot Merced River buffer would include locations at Backpackers Camp, North Pines Campground, Upper Pines and Lower Pines campgrounds, Yellow Pines Campground, former Upper River and Lower River campgrounds, Housekeeping Camp, the Curry Orchard parking lot, and Yosemite Lodge. Meadow restoration would take place at Ahwahnee, El Capitan, and Stoneman meadows, which would increase connectivity between the Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Proposed biological resource actions associated with Alternative 6 that would be deployed along Segment 2 include replacement of a trail with boardwalk, removal or realignment of Northside Drive and bike path would not occur, improve hydrologic connectivity along both sides of the road by installing culverts, and remove fill and replace with a boardwalk at Ahwahnee Meadow; and application of redesign and engineering solutions to promote water flow at the Orchard Parking Lot, with installation of up to 275 feet of boardwalk at Curry Village; restoration of 16.5 acres of floodplain including decompaction of soils and removal of asphalt, former roads, and campsites, re-establishment of filled channels, placement of large box culverts under road to all water flow, close riparian zone to prevent trampling at former Upper and Lower Rivers Campground; removal of all campsites and infrastructure within a 100 foot buffer of the river along Valley campgrounds with restoration of 6.5 acres of riparian habitat; use restoration fencing to prohibit foot traffic into El Capitan meadow, restore informal trails, and selectively remove conifers that block views at El Capitan meadow; re-development of the disturbed footprint of the former Yosemite Lodge units and cabins (those that were damaged after the 1997 flood and subsequently removed).

Rerouting and consolidation of trails, restoration of road areas and meadows, restoration of floodplain, decompaction, and removal of informal trails and limits to riparian area access could contribute to increased stormwater infiltration capacity and increased storm event hydrologic concentration times. Restoration of riparian and floodplain vegetation would generally slow floodwaters in the vicinity of the restored area, more closely mimicking natural conditions, although redevelopment of the disturbed footprint of the former Yosemite Lodge units would partially offset this benefit, resulting in a local, long-term, negligible, beneficial impact to hydrology and flooding.

Relocation and removal of facilities located in floodplain areas, including removal of existing fill, removal of campsites, removal of informal trails, relocation of paths, and other proposed facility realignments would reduce existing constraints on the natural floodplain of the river. Reductions in these constraints would reduce existing interference within the floodplain. Installation of culverts would also support floodplain function and minimize ponding in inappropriate areas. Therefore, this is considered a segment-wide, long-term, minor, beneficial impact with respect to flooding.

Implementation of engineering solutions to promote water flow at the Orchard Parking Lot would alleviate existing stormwater/flood related constrictions at the parking lot. This would result in a local, long-term, minor, beneficial impact on flooding.

Construction of the proposed biological resources actions, as well as redevelopment of the former Yosemite Lodge units and cabins, could result in temporary disturbance to surface sediments and vegetation. Disturbance would result primarily from the use of heavy machinery. Heavy machinery



would be used for soil decompaction, removal and relocation of asphalt areas, recontouring of topography, rerouting of trails, removal of informal trails, and removal of other infrastructure as noted previously. Minimal additional disturbance could occur during restoration activities and boardwalk installation, due to localized disturbance. Additionally, construction related use of heavy machinery could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants, during the construction process. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, short-term, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions that would occur under Alternative 6 along Segment 2 include movement of the unimproved parking area at Camp 6 north by approximately 150 feet away from the ordinary high water mark and restoration of riparian habitat along the river; all bridges would be retained under this alternative, but channel complexity would be increased by installing engineered log jams around Ahwahnee Bridge and Sugar Pine Bridge; the cut off channel before the Sugar Pine Bridge would be filled, and large wood would be placed below Sugar Pine bridge; placement of large wood, brush layering, and an engineered log jam so as to reduce the effects of Stoneman Bridge on hydrology and flooding characteristics of the river; install culverts along Northside Drive to improve drainage.

Stoneman Bridge, Sugar Pine Bridge, and Ahwahnee Bridge currently cause hydrologic constrictions along the Merced River. During moderate flow conditions, constrictions associated with these bridges interferes with natural hydrologic processes along the river, including reduction of channel migration, alteration of scour, and other hydrologic alterations. During high and flood flows, the bridges constrict flood flows, resulting in backup of flows behind the bridges, increases in flow velocity and scour in the vicinity of the bridges, and reduction in flows downstream of the bridges, in comparison to natural conditions. Therefore, installation of constructed logjams, placement of large wood, and filling of the cutoff channel before Sugar Pine Bridge, would in part reduce the existing effects of these structures on river hydrology and floodplain hydrology. Installation of the proposed large wood, brush layering, and engineered log jam would reduce the deleterious effects of Stoneman Bridge on the hydrology and flooding characteristics of the Merced River in its vicinity, but would not completely alleviate the existing constriction. Additionally, the long-term efficacy of these solutions is subject to uncertainty, and unanticipated washout would require periodic monitoring and maintenance of logjams and large wood placement by the NPS. If subsequent monitoring of riparian condition reveals insufficient improvement, more aggressive management action may be initiated, including the possible removal of Sugar Pine Bridge. Therefore, implementation of these actions would result in a local, long-term, minor, beneficial impact on hydrology and flooding.

Installation of the proposed culverts along Northside Drive would reduce existing stormwater drainage issues in that area, thereby reducing localized flooding conditions during major storm events.

This would result in a net improvement with respect to flooding, and is considered a local, long-term, minor, beneficial impact on flooding.

Moving the unimproved parking area at Camp 6 north and away from the ordinary high water mark of the river would result in the removal of existing structures that interfere with floodplain function. Removal of these structures would thereby reduce existing obstructions within the floodplain, and would thereby result in a net local, long-term, minor, beneficial impact on flooding.

With respect to water quality, during construction, removal of one bridges and other infrastructure from the Merced River and its floodplain, placement of logjams, fill, and other infrastructure within or along the Merced River, and other associated activities, would result in temporary construction related impacts to water quality. These could include incidental releases of sediment into natural waterways and the Merced River. Additionally, the use of heavy construction equipment during installation of these facilities could result in accidental release of construction related fluids, oils, fuels, greases, hydraulic fluid, and other potential construction related water quality pollutants during the construction period. Adhering to the proposed mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce these potential impacts to local, temporary, minor, and adverse.

Increases in riparian and floodplain vegetation associated with the proposed restoration activities, as noted above, would result in increased coverage of such vegetation along the river. Increases in riparian and floodplain vegetation coverage would result in reductions in sediment and other pollutant levels in stormwater that drains into the Merced River. Therefore, the proposed restoration activities would result in a segment-wide, long-term, negligible, beneficial impact on water quality.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Hydrology.** Under Alternative 6, overall visitor use would increase, including in riverside areas, thereby increasing trampling, informal trail development, and riverbank erosion. While employee housing would decrease, the number of campsites and lodging units would increase. Informal parking would be reduced. Under Alternative 6, impervious surface area would be expected to be similar to that of Alternative 1. This would not be expected to have a measurable effect on hydrology in the river, thus resulting in a local, long-term, negligible, adverse impact on hydrology.

Temporary housing in the Lost Arrow parking lot would be removed and permanent housing constructed, resulting in no net change in impervious surface area. This action would not affect hydrology.

**Water Quality.** Under Alternative 6, total visitation, lodging, camping, and parking within the Valley would increase. Residential development, however, would be reduced. These shifts would bring more visitors and vehicles into the Valley, thereby increasing the potential for sedimentation and vehicle-related pollutants to be washed into the river. While removal of trails and formalizing picnic areas would restore riparian vegetation and reduce erosion, and formalizing Merced River access points and trails would also reduce vegetation trampling and help to stabilize riverbanks, the net effect of these actions would be expected to result in a local, long-term, negligible, adverse impact on water quality.

New/expanded parking areas west of Yosemite Lodge and Camp 6 would generate discharges of sediment and automobile related pollutants into stormwater. Release of these pollutants could result in minor degradation of water quality downstream, and these actions constitute a local, long-term, minor, adverse impact on water quality.

**Curry Village & Campground.** Actions to manage user capacities, land use, and facilities in this area would include an increase in total units from 400 existing units to 453 units. Total lodging within this area would consist of 290 tent-style lodging units retained in Curry Village, 98 newly constructed hard-sided units in Boys Town, 18 units retained at Stoneman House, and 47 cabin-with-bath units retained in Curry Village.

Installation of the new units in Boys Town would require the addition of new impervious surfaces, and a net increase in total impervious surface area would be anticipated within this area. As noted previously, impervious surfaces increase stormwater runoff and shorten hydrologic concentration time. New impervious surfaces would be limited to facility footprints, and some additional access areas. Because new impervious surface areas would be limited in extent, these actions would result in a local, long-term, negligible, adverse impact on stormwater hydrology.

Construction of the proposed new units could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy construction equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

**Floodplains.** Under Alternative 6, existing development would be removed from the floodplain in several areas (see *Impacts of Actions to Protect and Enhance River Values*, above). The park would construct new campgrounds at the former Upper and Lower Rivers campgrounds, Upper Pines Campground, and install new RV camping facilities west of Yosemite Lodge. While these facilities would be constructed more than 150 feet from the river's ordinary high water mark, they would remain within the 100-year floodplain. The presence of such facilities would not be expected to substantially impact flood flows. Nonetheless, the presence of these campgrounds within the 100-year floodplain would make them susceptible to periodic flooding. The resulting floodplain impact would be local, long-term, negligible, and adverse.

**Camp 6 and Yosemite Village.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 primarily concern transportation improvements. Proposed projects would involve improvements to intersection function at Village Drive and Northside Drive near Camp 6, including construction of a pedestrian underpass and traffic circle to alleviate traffic congestion, and installation of a second traffic circle at the Sentinel Drive/Northside Drive intersection; installation of a three-way intersection at Sentinel Drive and the entrance to the parking area; redevelopment of the existing overflow parking area west of Yosemite Lodge to provide 300 additional parking spaces; and relocation of the Camp 6 day use parking area north by 150 feet in order to facilitate riparian restoration (restoration actions evaluated above). The Camp 6/Village Center parking area would be

increased to 850 units by redeveloping part of the current administrative footprint in that area. One hundred parking spaces would be added to the Yosemite Village parking area. The existing tour bus drop off area would be relocated to the Highland Court area. A 4,000 square foot addition to the Concessioner Maintenance and Warehouse building would also be installed.

Installation of new parking areas, roadways, traffic circles, the Concessioner Maintenance and Warehouse building, the new three-way intersection, and the pedestrian underpass would require the construction of new impervious surfaces. Net increases in impervious surface area would be largely offset by the removal of select existing parking facilities and roadways, as noted above, as well as improvements in drainage facilities associated with the new structures, and the addition of bioswales in parking areas. However, based on the anticipated increase in parking, road, and building area, a net increase in impervious surfaces is anticipated. As noted elsewhere, impervious surfaces increase stormwater runoff and a shorten hydrologic concentration time. The proposed actions would therefore result in a local, long-term, minor, adverse impact on stormwater hydrology. Relocation of the bus drop off area and additional bus loading and unloading spaces would not result in a change in impervious surfaces, because the affected areas are already impervious.

Demolition of existing parking areas and roadways slated for removal, as well as construction of new parking areas, roads, traffic circles, and the pedestrian underpass and other activities discussed above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The use of the proposed new parking areas would serve to consolidate existing parking activities into formalized areas, reducing reliance on informal parking areas. Therefore, the anticipated increase in formalized parking spaces is not expected to result in increased use, but would accommodate existing use that currently relies on other facilities. Similarly, moving the existing bus stop to a new location would not represent a new or increased intensity of use. Therefore, no net change in water quality pollutants related to parking lots is anticipated, because existing effects would be consolidated into formalized parking areas.

The existing Camp 6 day use parking area is located within the 10-year floodplain. Parking lots do not generally constitute major obstructions to flood flows, and so their presence within a floodplain is generally less obstructive than other vertical development; although minor effects, such as localized interference with flood flows, could still occur during a flooding event. A parking lot in the floodplain does, however, remove floodplain vegetation and soils. This rougher natural surface slows floodwaters, filters suspended sediment, and buffers the impacts of flooding. Moving the existing facility by up to 150 feet could result in a negligible reduction in the area of parking lot that is located within the 10-year floodplain. However, the parking lot would remain within the 100-year floodplain and therefore continue to have a local, long-term, minor, adverse impact with respect to flooding.

**Yosemite Lodge and Camp 4.** Actions to manage user capacities, land use, and facilities within this area of Segment 2 are limited to the replacement of the existing on-grade pedestrian crossing located west of the intersection of Northside Drive and Yosemite Lodge Drive with a pedestrian underpass. This action would be completed in order to alleviate pedestrian/vehicle conflicts.

Installation of an underpass would result in a slight expansion of the area of impervious facilities located on site, as compared with those of existing conditions. Because impervious surfaces increase stormwater runoff and peak runoff flows, the anticipated net increase in impervious surfaces would result in a local, long-term, negligible, adverse impact on hydrology.

Construction of the proposed underpass could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. The use of heavy excavation and construction related equipment would also disturb surface sediments within affected areas, could require stockpiling of spoils, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants. These activities would result in a local, short term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

The facilities in question would be located outside of the existing floodplain, and therefore would not affect flooding.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, long-term, minor, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible to minor, adverse impacts on hydrology, water quality, and floodplains.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** Oak protection, removal of fill, and decompaction of soils in the Odger's fuel storage area would promote infiltration in the area, but would not have a discernible effect on the hydrology of the Merced River, thus resulting in a local, long-term, negligible, beneficial impact on hydrology.

**Water Quality.** Parking restrictions in the Odger's fuel storage area would result in established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

**Hydrology.** Construction of new housing in the Rancheria Flatt and Abbieville areas of El Portal would involve vegetation removal, soils compaction, and increased areas of impervious surfaces outside the 100-year floodplain. These actions would have a local, long-term, minor, adverse impact on hydrology.

**Water Quality.** Construction of new housing and parking lots, as described above, could cause an increase in the amounts of debris, sediment, and other potential water quality pollutants picked up by stormwater runoff. Additionally, the use of heavy construction related equipment would also disturb surface sediments, and could result in the accidental release of fuels, oils, greases, antifreeze, and other potential construction-related water quality pollutants into stormwater. These activities would result in a local, short-term, minor, adverse impact on water quality. Implementation of mitigation measures MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C), would reduce the intensity of potential demolition and construction related water quality impacts to negligible.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have local, long-term, negligible, beneficial impact on the river's hydrology and water quality. Actions to manage visitor capacity, land use, and facilities would have a long-term, minor, adverse impact on hydrology.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrology.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas would result in a decrease of trampling and an increase in soil infiltration. Impervious surfaces would be reduced, leading to an increase in the infiltration capacity of the area, thereby restoring the hydrologic regime. This would be expected to have a measurable effect on hydrology in the Merced River, but would not be expected to have an overall effect on the character of the river and would result in a local, long-term, minor, beneficial impact on hydrology.

**Water Quality.** The removal and restoration of campsites that are either within the 100-year floodplain or in culturally sensitive areas would result in reduced trampling and established vegetation that would be less likely to erode, thereby reducing fine sediment loads. This would not be expected to have a measurable effect on water quality and would result in a local, long-term, negligible, beneficial impact on water quality.

**Floodplains.** The removal and restoration of campsites either within the 100-year floodplain or in culturally sensitive areas would increase connectivity between the Merced River and its floodplain in a detectable manner. This would result in a local, long-term, minor, beneficial impact on floodplains.

**Biological Resource Actions.** Along Segment 7 under Alternative 6, relocation of two stock use campground sites from sensitive biological resource areas to Wawona Stables would be the same as described for Alternative 2, and therefore would incur the same impacts as discussed for Alternative 2. Please refer to the discussion for Alternative 2.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Hydrology.** The removal of facilities under Alternative 6 would reduce the amount of impervious surfaces within Segments 5, 6, 7, and 8, leading to a more natural hydrologic regime, though not to a measurable extent. This would result in a local, long-term, negligible, beneficial impact on hydrology.

**Wawona.** Removal of 13 campsites from areas located within 100 feet of the river would reduce existing effects of trampling on riverbank areas, and would support reduced erosion rates within the area. This would result in a local, long-term, minor, beneficial impact on water quality due to reduced erosion rates. Similarly, removal of 13 campsites from within the existing floodplain would result in a net reduction in floodplain area that is impacted by existing facilities. Removal of these sites would result in a local, long-term, negligible, beneficial impact on floodplains and flooding. Finally, removal of the existing facilities would involve minimal demolition related activities, which could include the use of heavy machinery, as well as other minor restoration activities. These construction activities would require implementation of mitigation measures MM-HYD-1, through MM-HYD-5, as appropriate (see Appendix C), which would ensure that potential water quality impacts would be local, short-term, negligible, and adverse.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segments 5-8 would have local, long-term, negligible to minor, beneficial impacts on hydrology, water quality, and floodplains. Actions to manage user capacities, land use, and facilities would have local and segmentwide, long-term, negligible, beneficial impacts on hydrology, water quality, and floodplains.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

**Hydrology.** Actions associated with Alternative 6 would have long-term, negligible to minor, beneficial impacts on hydrology. Restoration actions associated with all Alternative 6 would decompact soil and restore meadow and riparian areas. Actions associated with the removal of impervious surfaces would increase infiltration and partially restore the natural hydrologic regime in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the Merced River, thereby restoring hydrologic processes in a detectable manner.

**Water Quality.** Actions associated with Alternative 6 would have long-term, minor, beneficial impacts on water quality. Restoration actions associated with Alternative 6 would restore denuded vegetation and limit informal trails, leading to a reduction in erosion. Actions associated with in-river restoration would help to stabilize eroded areas, thereby reducing fine sediment in a detectable manner. Construction activities associated with restoration have the potential to adversely affect water quality over the short term, but would be mitigated to a negligible level by instituting measure MM-HYD-1 through MM-HYD-5, as appropriate (see Appendix C).

**Floodplains.** Actions associated with Alternative 6 would have long-term, negligible to minor, beneficial and adverse impacts on floodplains. Restoration actions associated with Alternative 6 would reconnect the Merced River and its floodplain in a detectable manner. Actions associated with in-river restoration would add roughness and complexity to the river, partially reconnecting the river to its floodplain and creating a long-term, negligible, beneficial impact on 100-year floodplains.



### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The cumulative impacts analysis for Alternative 2 reflects the historic timeframe for installation of the various past, present, and reasonably foreseeable future actions listed below. The spatial dimension for the cumulative impacts analysis encompasses the portion of the Merced River watershed that is located within the Park. The cumulatively considerable projects for Alternative 2 would be the same as those presented in Alternative 1.

#### ***Overall Cumulative Impact Common for Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

Under Alternative 6, removal of riprap, removal of unnecessary infrastructure, restoration of meadow hydrology, installation of logjams and other hydrologic enhancements along Merced River, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, minor, beneficial cumulative impacts on hydrology, floodplains, and water quality.

## Vegetation and Wetlands

### *Affected Environment*

#### Regulatory Framework

##### *Vegetation*

NPS Management Policies (2006) establishes Service-wide vegetation management policy. These policies state, “Whenever possible, natural processes will be relied upon to maintain native plant and animal species and influence natural fluctuations in populations of these species.” The 1997 Vegetation Management Plan (NPS) provides broad guidance and specific implementation plans for vegetation management in Yosemite. Specific statutory directives that influence vegetation management in Yosemite include Executive Order No. 13112 - Invasive Species. The 2008 Yosemite Invasive Plant Management Plan and its 2010 Update (NPS) and the Fire Management Plan for Yosemite National Park (NPS 2004b) are park-specific plans play a large part in protecting the integrity of vegetation in Yosemite. The Merced River Plan/DEIS defers to these plans in most cases to provide a framework for invasive plant management efforts and supports the use of fire to shape the ecosystems of the park.

##### *Wetlands*

The NPS will manage wetlands in compliance with NPS mandates and the requirements of the Clean Water Act (CWA), the Rivers and Harbors Appropriation Act of 1899 (Rivers and Harbors Act), Executive Order 11990 (“Protection of Wetlands”), the procedures described in Director’s Order 77-1 (“Wetland Protection”), and its accompanying *Procedural Manual #77-1* (NPS 2008). Executive Order 11990 directs the NPS to (1) provide leadership and take action to prevent the destruction, loss, or degradation of wetlands; (2) preserve and enhance the natural and beneficial values of wetlands; and (3) avoid direct and indirect support of new construction in wetlands unless there are no practicable alternatives and the proposed action includes all practicable measures to minimize harm to wetlands. Any actions that may reduce or degrade wetlands are governed by the CWA and Rivers and Harbors Act, and regulated by the U.S. Army of Corps of Engineers (Corps) and the U.S. Environmental Protection Agency. The NPS will implement a “no net loss of wetlands” policy (NPS 2006, section 4.6.5).

**Clean Water Act.** The CWA requires the NPS to comply with all federal, state, interstate, and local requirements to control and abate water pollution. CWA section 404 regulates the discharge of dredged and fill materials into waters of the United States. Waters of the United States refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands. Applicants must obtain a permit from the Corps for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. Under CWA section 401, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a section 404 permit) must also comply with CWA section 401.

**Rivers and Harbors Act of 1899.** Section 10 of the Rivers and Harbors Act prohibits the unauthorized obstruction or alteration of any navigable water of the United States. The act regulates construction of any structure in or over any navigable water. This includes any work that might affect the course,

location, condition, or physical capacity of such waters. Work must be recommended by the Chief of Engineers and authorized by the Secretary of the Army.

**Executive Order 11990.** “Protection of Wetlands” establishes the protection of wetlands and riparian systems as the official policy of the federal government. It requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. A Wetland Statement of Findings is prepared if adverse impacts on wetlands are identified. The Wetland Statement of Findings for the *Merced River Plan/DEIS* is included as Appendix O. The NPS Director’s Order #77-1 (“Wetland Protection”) gives implementation detail to Executive Order 11990.

### Regional Vegetation

The major vegetation zones of the Sierra Nevada region form readily apparent, large-scale, north-south elevational bands along the axis of the Sierra Nevada range. In the Yosemite region, these vegetation zones include foothill-woodland, lower montane forest, upper montane forest, subalpine forest, and alpine zones; they are distributed from the lowest elevations on the western boundary of the park to the highest elevations along the crest of the Sierra Nevada range. Major east-west watersheds that dissect the Sierra Nevada range into steep canyons form a secondary pattern of vegetation.

A parkwide vegetation map — the first vegetation map of Yosemite since the 1930s — was created over a 10-year period, from 1997 to 2007. It combines detailed data from 1,500 aerial photographs and hundreds of field surveys to provide information on floristic classification. The map identifies 129 distinct vegetation classes, which are grouped into eight broad vegetation types. This map was used to determine the broad vegetation types that occur within the Merced River corridor. The broad vegetation types are discussed in more detail below.

### Merced River Vegetation

As discussed above, Yosemite National Park supports eight major vegetation types, all of which occur within the Merced River corridor and are discussed below and presented in **table 9-2** and **figure 9-7**. Within these eight broad vegetation types, the parkwide vegetation map includes 129 distinct vegetation classes. The following narrative provides a general description of vegetation types within 1.5 miles of the Merced River (study area). Descriptions of plant communities, including distribution limits, habitat requirements, community sensitivities, and a list of plant species characteristically found in conjunction with each plant assemblage appear in the *Vegetation Management Plan* (NPS 1997c), the *Parkwide Vegetation Map* (NPS 2007), the *Merced River and Riparian Vegetation Assessment* (Cardno ENTRIX 2011), and the *2010 Assessment of Meadows in the Merced River Corridor, Yosemite National Park* (Ballenger et al. 2011).

**TABLE 9-2: MAJOR VEGETATION TYPES IN THE MERCED RIVER CORRIDOR**

Vegetation Type	Area per Segment (acres)								Total
	1	2	3	4	5	6	7	8	
Alpine (9,500 to 11,800 feet)*	87.8	0	0	0	6.5	0	0	0	94.3
Meadow (2,000 to 11,000)	1,801.3	324.1	67.6	28.8	389.0	0	140.6	0.9	2,752.3
Chaparral (2,000 to 10,000 feet)	1,669.1	991.4	2,270.6	74.9	694.0	0	166.4	66.6	5,933.0
Subalpine Coniferous Forest (8,000 to 9,500 feet)	9,610.4	45.8	0	0	3,108.9	0	0	0	12765.1
Upper Montane Coniferous Forest (6,000 to 8,000 feet)	16,525.7	3,697.0	1,572.0	0	11,611.8	23.3	990.5	28.4	34,448.7
Lower Montane Coniferous Forest (3,000 to 6,000 feet)	3,505.6	7,248.5	4,785.3	151.4	6,010.4	72.0	4,969.0	1,980.8	28,723.0
Lower Montane Broadleaf Forest (3,000 to 6,000 feet)	461.6	3,331.4	2,982.7	569.7	816.7	3.4	761.1	397.0	9,323.6
Foothill Woodland (1,800 to 3,000 feet)	0	0	9.8	324.8	0	0	0	0	334.6
Barren (1,800 to 11,800 feet)	14,143.4	2,319.5	455.7	27.6	2586.4	2.9	170.2	2.6	19,708.3
Developed	0.3	150.0	59.3	54.5	8.1	0.2	82.2	10.3	364.9
*Elevation ranges are approximated									
SOURCE: NPS 1997; NPS 2007									

## Merced River Wetlands and Riparian Habitats

Wetlands and riparian areas are distinct habitats that provide a variety of hydrologic and ecological functions vital to ecosystem integrity. These functions include flood abatement, sediment retention, groundwater recharge, nutrient capture, and support of high levels of plant and animal diversity. Many riparian areas are classified as wetlands. Wetlands and riparian areas are relatively rare compared with the entire landscape. Modification of even small wetland areas can induce effects that are proportionally greater than elsewhere in an ecosystem due to the ecological importance of wetlands. Wetlands receive special protection under Executive Order 11990 (“Protection of Wetlands”), and section 404 of the CWA.

The NPS parkwide vegetation map classifies some riparian communities; however riparian and wetland areas are not classified independently under the eight broad-scale vegetation types used in the parkwide vegetation map, and the minimum mapping unit is too large to capture many riparian areas and wetlands. For the purposes of this document, the NPS used additional data to quantify and describe wetlands and riparian habitat. Wetland data were obtained from site-specific wetland delineations for limited areas in Yosemite Valley. National Wetland Inventory data (USFWS 1995),

supplemented with data from the Yosemite Parkwide Vegetation Map (1997), were used to describe wetlands in the Merced River corridor in areas where delineation data were not available (site-specific wetland delineation data was only available for limited areas in Yosemite Valley). Data on riparian habitats was obtained from the *Merced River and Riparian Vegetation Assessment* (Cardno ENTRIX 2011) for the river corridor through Yosemite Valley. Data from the Yosemite Parkwide Vegetation Map (1997) were used to describe riparian habitats outside of Yosemite Valley.

Wetland and riparian habitat data presented in this section are descriptive, including actual extent (location on the ground and acreage) for each segment of the Merced corridor within Yosemite National Park. This provides an overview of the types of wetlands and riparian habitats that occur across the study area. The intent is to provide general descriptions, functions, and values of wetland and water-dependent communities within the study area.

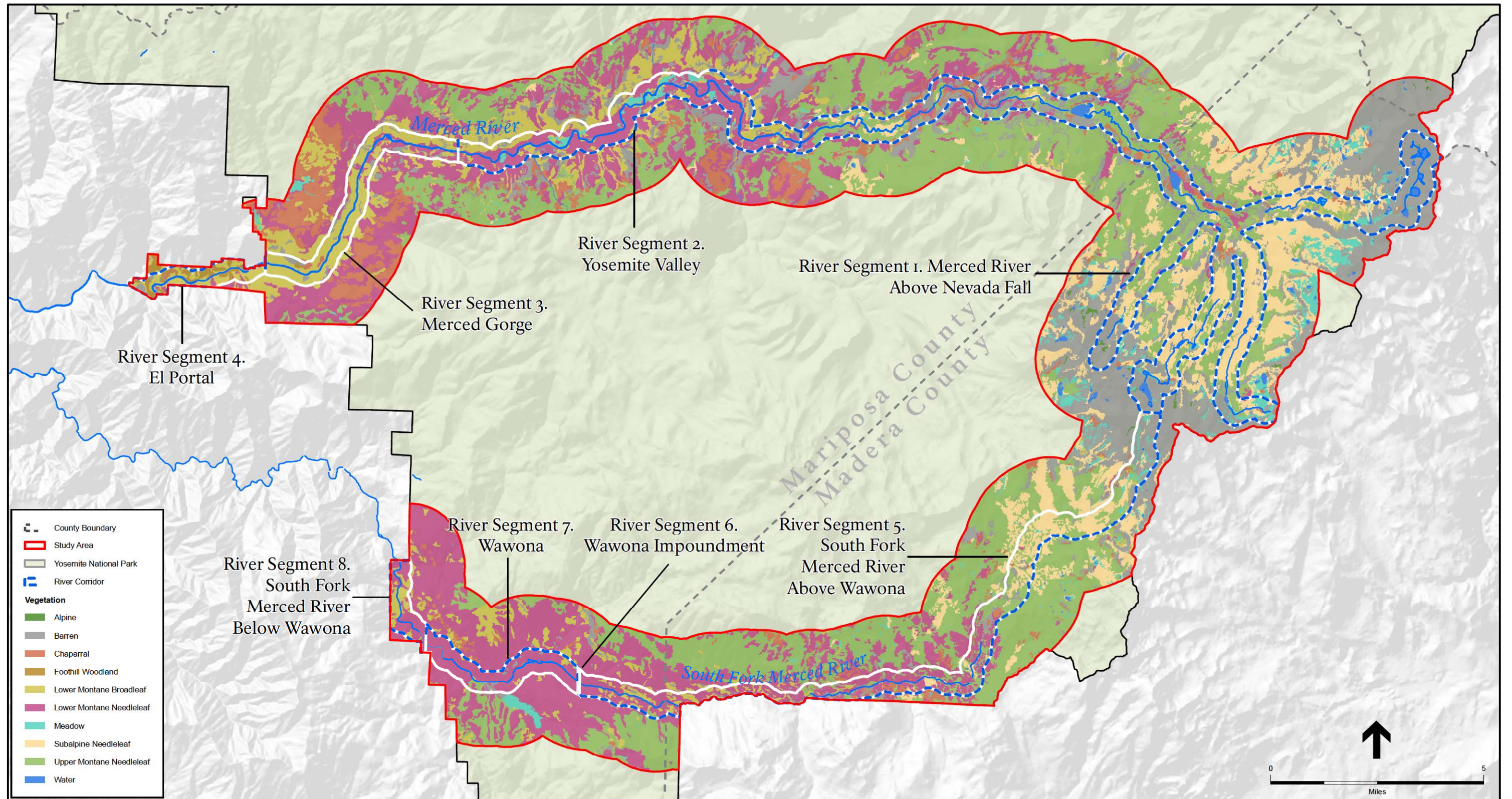
### *Wetland Classification and Definition*

The NPS standard for identifying wetlands is a system developed by wetland ecologists and an interagency team for the U.S. Fish and Wildlife Service (USFWS) referred to as the Cowardin classification system (Cowardin et al. 1979). Wetlands, as defined by the USFWS, are transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water (Cowardin et al. 1979). For purposes of this classification, wetlands must have one or more of the following attributes:

- The land predominantly supports hydrophytes, at least periodically. Hydrophytes are plants that grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.
- The substrate is predominantly undrained hydric soils. Hydric soils are wet long enough to periodically produce anaerobic conditions.
- The substrate is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin et al. 1979).

The Corps uses three wetland parameters to define wetlands for regulatory purposes: hydrophytic vegetation, hydric soil, and wetland hydrology. When all three parameters are present, the wetland is considered a jurisdictional wetland. The Cowardin system defines more habitat types as wetlands than does the Corps definition as it recognizes some unvegetated sites (e.g., mudflats, stream shallows, saline lakeshores, playas) or sites lacking soil (e.g., rocky shores, gravel beaches) as wetland habitats if wetland hydrology is present. The reason these sites lack hydrophytic vegetation and/or hydric soil is due to natural chemical or physical factors. Although the Corps does not consider these sites to be wetlands, they are still subject to regulations under section 404 of the CWA as other waters of the United States. For purposes of this document, both Cowardin wetlands and waters of the United States as defined by the Corps are referred to as wetlands.





SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-7**  
Vegetation in the Project Area



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Specific wetland classes identified within the river corridor include riverine (rivers, creeks, and streams), palustrine (shallow ponds, riparian wetlands, wet meadows, marshes), and lacustrine (lakes and ponds). Using the Cowardin classification system, specific wetlands and deepwater classes within the Merced River corridor consist of the following subclasses:

- *Riverine upper perennial* — main channels of the Merced River and the South Fork Merced River (may be wetland or deepwater habitat depending on depth)
- *Riverine intermittent* — intermittent tributaries to the Merced River and South Fork Merced River (wetlands)
- *Palustrine emergent* — emergent wetland habitat (marsh, meadow) along the Merced River and South Fork Merced River subject to various flooding regimes
- *Palustrine forested* — riparian forest wetland habitat along the Merced River and South Fork Merced River subject to various flooding regimes
- *Palustrine scrub shrub* — riparian scrub (e.g., willow) wetland habitat along the Merced River and South Fork Merced River and its tributaries subject to various flooding regimes
- *Lacustrine littoral* — shallow lake margins that are less than 2 meters deep at low water and have less than 30% vegetation cover
- *Lacustrine limnetic* — portions of lakes that are more than 2 meters deep at low water (e.g., Merced Lake, Washburn Lake) along the Merced River (deepwater habitat)

The following discussion provides general descriptions for each wetland class identified within the Merced River ecosystem.

**Riverine Upper Perennial.** Riverine upper perennial habitat within the corridor includes the open and flowing water of the Merced River and the South Fork Merced River. It is the permanently flooded rock-, cobble-, or sand-bottom channel with little to no in-stream vegetation. Occasional sandbars form within and at the channel edge and typically support willows and emergent (grasses and herbs) vegetation. Based on the NPS guidelines, the majority of the main stem of the Merced River and the South Fork Merced River would be classified as riverine upper perennial wetland. Channel portions that lie at a depth of 2 meters below low water would be considered deep water. The main channel of the Merced River and the South Fork Merced River would likely be considered as jurisdictional by the Corps under section 404 of the CWA, not as wetlands but as other waters of the United States.

**Riverine Intermittent.** Numerous riverine intermittent drainages (other waters of the United States) are tributaries to the main stem Merced River and the South Fork Merced River. Almost all riverine intermittent drainages within the river corridor are classified as Cowardin wetlands and waters of the United States. These drainages often have a nonsoil substrate that is saturated and/or covered by shallow water at some time during the growing season. These wetlands are typically narrow and encompass the lowest portion of creekbeds. Very little wetland vegetation is found in these areas because of the intermittent nature of the flows within the drainage channels. All aboveground drainages within the river corridor are subject to the NPS protection policies under Executive Order 11990. These drainages are classified as other waters of the United States and would be subject to sections 401 and 404 of the CWA.

**Palustrine Emergent.** Palustrine emergent wetland habitat includes portions of alpine, subalpine, and montane meadows<sup>1</sup> and seeps. These wetland soils are generally deep and peaty, remaining saturated year-round or on a seasonal basis. Vegetation is dominated by grasses, sedges, rushes, and perennial herbs. The meadow wetlands in Yosemite National Park play a particularly critical role in the Merced River ecosystem. High spring flows create wet areas in side channels, low-lying wetlands, meadows, and cutoff channels. These areas support the concentration of organic matter, nutrients, microorganisms, and aquatic invertebrates throughout the relatively dry summer. When the flush of winter or spring flooding occurs, this stored aquatic biomass is washed into the main river channel, forming the base of the aquatic food chain. Examples of palustrine wetlands include portions of Cook's Meadow and meadows adjacent to Washburn and Merced Lakes. These meadow portions are considered wetlands under the Cowardin system, and portions of meadows may also meet the Corps' wetland criteria. Delineated palustrine emergent wetlands are subject to the NPS protection policies under Executive Order 11990 and section 404 of the CWA.

**Palustrine Forested.** Palustrine forested wetlands are the riparian forest habitats along the main stem of the Merced River and South Fork Merced River that are regularly inundated by normal high-water or flood flows. Palustrine forests within the upper reaches of the main stem of the Merced River and South Fork Merced River consist mainly of evergreen pines and firs, with occasional aspens. In Yosemite Valley, where the river is broad, shallow, and slow-moving, deciduous cottonwoods, willows, and alders dominate the riparian corridor. Substrate under the palustrine forest community varies from rock, gravel, sand, clays, loams, and mud. These areas are classified as either wetland or other waters of the United States by the Corps, depending on site-specific vegetation, soils, and hydrologic conditions, and would be subject to section 401 and/or 404 of the CWA.

**Palustrine Scrub Shrub.** This habitat type occurs sporadically along the banks of the main stem of the Merced River, the South Fork Merced River, and at lake margins. It is regularly inundated by normal high-water or flood flows. This habitat is dominated by various willows and often intergrades with meadow (palustrine emergent) and riparian (palustrine forest) communities. These communities are typically considered wetlands under the Cowardin system, would be subject to the NPS protection policies under Executive Order 11990, and typically meet the Corps' wetland criteria. These areas may meet the Corps' criteria of a wetland or other waters of the United States, depending on site-specific vegetation, soils, and hydrologic conditions, and may be subject to sections 401 and/or 404 of the CWA.

**Lacustrine Littoral.** Lacustrine littoral includes all wetland habitats within a lacustrine system. This classification extends from the shoreward boundary of the system to a depth of 2 meters below low water or to the maximum extent of emergent vegetation. These habitats are adjacent to deep-water lakes and reservoirs along the Merced River. These communities are typically considered wetlands under the Cowardin system, would be subject to the NPS protection policies under Executive Order 11990, and may meet the Corps' wetland criteria, depending on site-specific vegetation, soils, and hydrologic conditions, and may be subject to sections 401 and/or 404 of the CWA.

**Lacustrine Limnetic.** Lacustrine limnetic refers to deepwater lakes and reservoirs, such as Merced and Washburn lakes. Both lakes were formed along the Merced River by glacial activity. In-lake

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<sup>1</sup> As discussed in this section, the term "meadow" can refer to both upland meadows and wetland meadows. When specifically discussing wetland meadows, the wetland nature of the meadow will be indicated.

vegetation is typically limited to rooted aquatic grasses, floating vascular plants, and algae. Meadow (palustrine emergent) and riparian (palustrine forest and palustrine scrub shrub) communities generally border lake margins.

These lakes provide important habitat for fish, amphibians, reptiles, and other aquatic species. Substrate varies from rock, gravel, sand, and mud. Lacustrine limnetic (deepwater lakes and ponds) are classified as deepwater habitat based on the Cowardin system (USFWS 1995). These areas are typically classified as other waters of the United States by the Corps and would be subject to regulation under section 404 of the CWA.

### ***Areal Extent of Wetland and Riparian Habitats***

There are wetlands and/or riparian habitats in every segment of the Merced River corridor. The classes and extent of wetlands and riparian habitats are summarized in **table 9-3**. In order to provide clarity to the discussion on wetlands and riparian habitats under the “Environmental Consequences” section below, the six Cowardin classes were consolidated into two broader classes (“Wetlands” and “Riparian Habitats”).

**TABLE 9-3: CLASSES AND AREAL EXTENT OF WETLANDS AND RIPARIAN HABITATS IN THE MERCED RIVER CORRIDOR**

Wetland/Riparian Class		Area per Segment (acres)							
Name	Cowardin Class	1	2	3	4	5	6	7	8
<b>Wetlands</b>	Riverine/Lacustrine	404.5	141.0	96.2	42.3	89.5	0.4	64.0	27.7
	Palustrine Emergent Wetland (wet meadows)	216.5	261.2	0	1.7	69.8	0	0	0
<b>Riparian Habitats</b>	Palustrine Forested Wetland	0	116.7	11.8	5.2	0.9	0	0	0
	Palustrine Scrub Shrub Wetland	10.0	13.7	12.0	4.6	3.3	0	2.5	0
SOURCE: USFWS 1995; NPS 1997; NPS 2011									

## **Vegetation**

### ***Segment 1: Merced River Above Nevada Fall***

At its headwaters, the Merced River begins in the lower alpine/subalpine forest zone. The river then descends through the upper montane forest zone and flows through Little Yosemite Valley within the lower montane forest zone. Vegetation in the upper main stem river corridor is classified into seven broad vegetation types: meadow, chaparral, lower montane broadleaf forest, lower montane coniferous forest, upper montane coniferous forest, subalpine coniferous forest, and alpine plant communities. There are also areas categorized as barren, which include talus and scree slopes, permanent snowfields, boulder fields, and other unvegetated areas. Segment 1 of the river is designated as Wilderness. Along many segments of the upper Merced River corridor, the river is bordered by a narrow riparian zone, and small wetlands occur throughout Segment 1. As mentioned above (see Merced River Wetlands and Riparian Habitats), riparian and wetland areas are not classified independently under the eight broad

vegetation types used in the parkwide vegetation map. These habitats are discussed in depth in the “Wetland and Riparian Habitats” subsection below.

**Meadow Plant Communities.** Numerous small meadows and adjacent riparian habitat are present in the upper reaches of the Merced River corridor above Nevada Fall (NPS 1997c, **figures 9-8 and 9-9**). These high-elevation meadows (above 7,000 feet) can be subdivided into alpine meadows (above 9,600 feet) and subalpine meadows (7,000 to 9,600 feet). Subalpine and alpine meadows are further subdivided into wet and dry types with both types sometimes occurring in the same meadow. High-elevation meadows within Segment 1 are considered a key element of the river’s biological ORV.

Alpine meadows form thin margins around small glacial lakes and are generally steeper, rockier, and support sparser and shorter vegetation than lower elevation meadows. Alpine meadows exhibited less conifer encroachment, no presence of non-native species, and little to no impacts from visitor use or pack stock. Formal NPS trails run through some alpine meadows in the Red Peak and Triple Peak Forks and exhibit trail braiding and rutting (Ballenger et al. 2011).

In many areas (for example, the margins of Merced and Washburn Lakes), subalpine meadows form a transition zone from the aquatic environment to drier coniferous forests. At these elevations (7,000 to 9,600 feet), larger meadow complexes are infrequent but are present in some locations. A large meadow plant community occurs within Echo Valley. These wetland plant communities are hydrologically driven by the groundwater and flooding regime of the Merced River (NPS 1997; Ballenger et al. 2011; Sawyer et al. 2009).

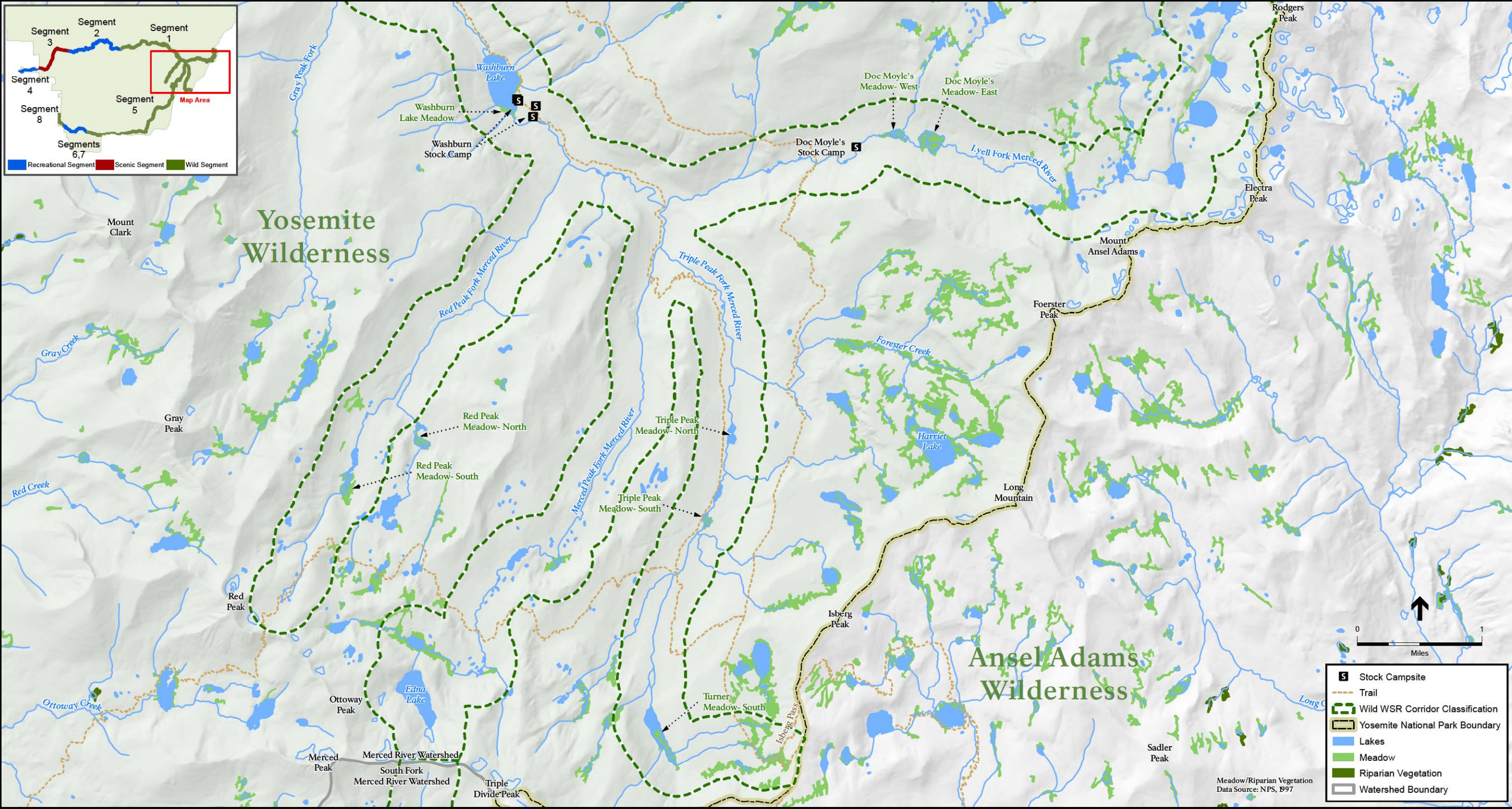
Although human presence in these areas now designated as wilderness has been ongoing for thousands of years, the upper reaches of the Merced River and its associated riparian and wetland communities remain intact and relatively free from disturbance. Although subalpine meadows historically experienced grazing impacts, most of the meadows in Segment 1 have not been grazed for several decades. The meadows at Merced Lake were grazed by NPS and concessioner stock until 1987, and they showed typical grazing-related impacts such as trampling, erosion, and a decline in herbaceous production when documented in 1961 (Sharsmith). Meadows in this area were closed to stock in the 1990s, with the exception of Merced Lake East Meadow, which currently serves as a holding area for NPS stock. This meadow has the highest levels of pack stock use in terms of vegetation and bare ground of any meadow in the corridor. The vegetation in Merced Lake-West and Merced Lake-Shore meadows appears to have recovered since these meadows were closed to grazing (Ballenger et al. 2012).

The recently completed *2010 Assessment of Meadows in the Merced River Corridor, Yosemite National Park* (Ballenger et al. 2011) provides detail on the current condition of meadow habitats in the Merced River corridor in Yosemite National Park. The authors found that subalpine meadows in the Merced River corridor are dominated by native graminoids,<sup>2</sup> a potentially healthy sign of meadow integrity because these species create dense sods that stabilize soils. Subalpine meadows in the Red Peak Fork and Triple Peak Fork have a relatively higher proportion of subshrubs and forbs. Bladder sedge (*Carex utriculata* and *C. vesicaria*) communities dominate most subalpine zone meadows in the Little Yosemite, Merced Lake, Doc Moyle’s, and Washburn Lake meadows. The dominance of these

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<sup>2</sup> Graminoids are grasses and grass-like plants, and include plants in the Poaceae (grasses), Cyperaceae (sedges), and Juncaceae (rushes) families.

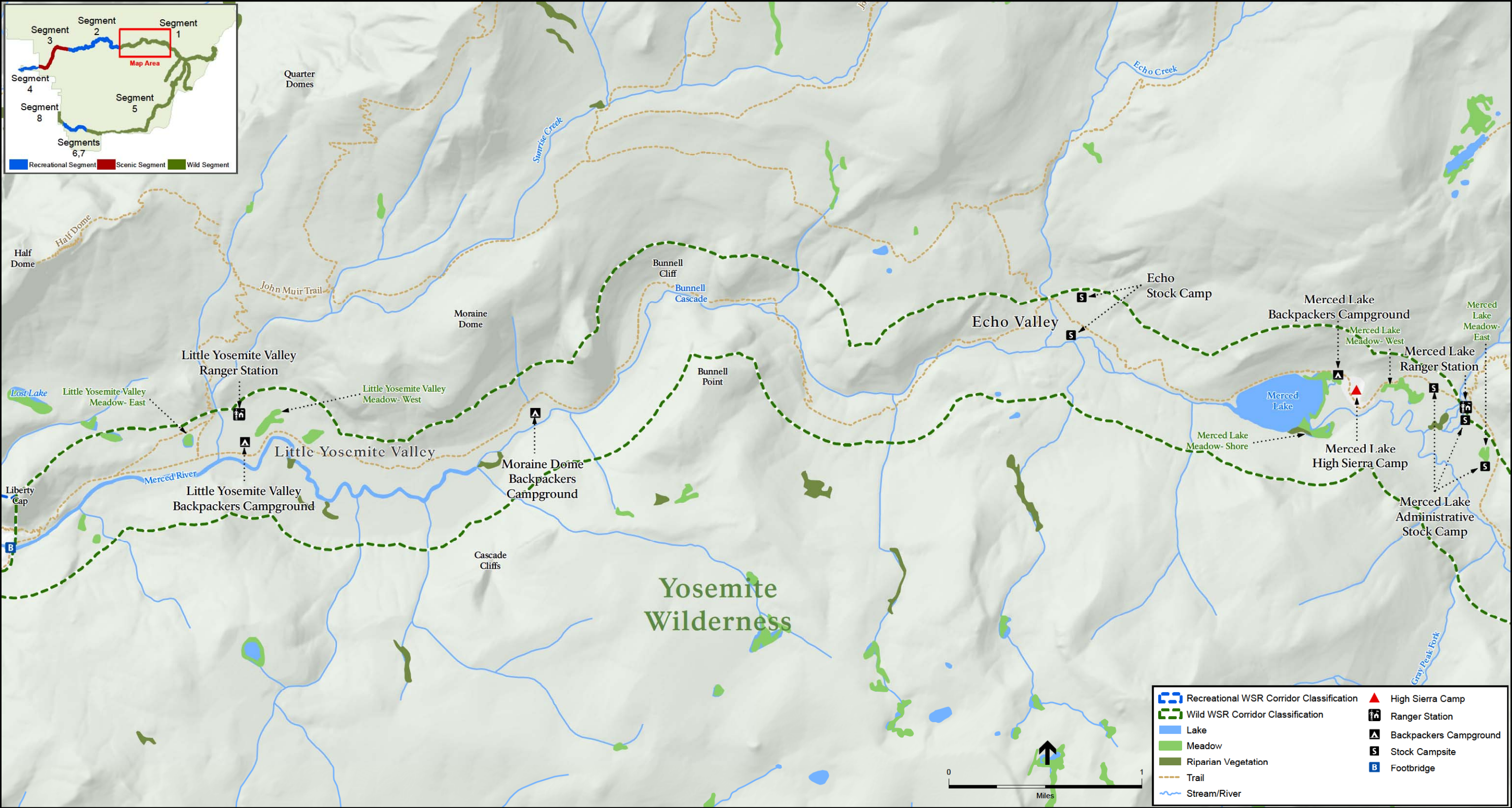




SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436  
**Figure 9-8**  
Segment 1 - Merced River Above Nevada Fall Meadows





SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-9**  
Segment 1 - Little Yosemite Valley and  
Merced Lake High Sierra Camp Meadows

obligate wetland species indicates that these meadows stay wet later into the growing season when compared to many of the other meadows along Segment 1.

The extent of conifer encroachment in subalpine meadows varies widely, with some meadows (Merced Lake–East and Little Yosemite Valley–East) having no seedlings present and others (Turner Lake, Triple Peak–North and Red Peak–South) having three to four times the extent of conifer encroachment relative to other subalpine meadows.

With the exception of the Little Yosemite Valley area, nonnative species are uncommon in meadows of the Merced River high country, and were not observed in any meadows along the Merced River above Washburn Lake. Nonnative Kentucky bluegrass (*Poa pratensis* ssp. *pratensis*) is found in drier areas of Little Yosemite Valley–East and is found in abundance around cabins at Merced Lake High Sierra Camp (Colwell and Taylor 2011), while the nonnative bull thistle (*Cirsium vulgare*) is found in the wooded area outside Merced Lake East Meadow. Other nonnative plants, including velvet grass (*Holcus lanatus*), common mullein (*Verbascum thapsus*), yellow salsify (*Tragopogon dubius*), prickly lettuce (*Lactuca serriola*), timothy (*Phleum pretense*), and dandelion (*Taraxacum officinale*) were detected outside of the meadows during surveys in 2006–2010 in Little Yosemite Valley (Ballenger et al. 2011). These nonnative populations are controlled through annual hand-pulling.

The 2010 *Assessment of Meadows in the Merced River Corridor, Yosemite National Park* (Ballenger et al. 2011) concluded that pack stock impacts or vulnerability to impact in subalpine meadows were a primary consideration for management of these areas. Potential issues related to pack stock use raised in the study include levels of use, timing of use, and suitability for use. The issues are particularly important for those subalpine meadows (such as Merced Lake and Doc Moyle’s) with wet soils supporting hydrophytic sedge species.

Only limited data are available on the extent of stock use in Segment 1 of the Merced River. **Table 9-4** shows the total annual number of stock-use nights within Segment 1 by NPS administrative and commercial operators. The majority of stock-use nights occur at Merced Lake–East. The *Assessment of Meadows in the Merced River Corridor* found that pack stock impacts were absent or uncommon in most subalpine meadows, with the exception of Merced Lake–East, which had the highest levels of pack stock use of any meadow in the corridor, and Doc Moyle’s–West, which had much lower levels of use and associated impacts. The study hypothesized that pack stock use contributes to lower vegetation cover and higher levels of bare ground at Merced Lake–East. The two meadows nearest Merced Lake–East (Merced Lake–West and Merced Lake–Shore) exhibited higher vegetative cover and lower bare ground levels when compared to Merced Lake–East, even though they had the same dominant plant species. Although grazed in the past, these two meadows were closed to stock use in the 1990s due to concerns over deteriorating conditions. Ballenger et al. (2011) concluded that these two meadows appeared to have recovered from previous stock impacts, and that they could provide a comparative baseline when monitoring conditions in Merced Lake–East. The study also found that Doc Moyle’s–West may be recovering from heavy use of the site as a pack camp in the mid 20th century. Scattered signs of stock use, such as hoof punches and/or manure, were observed in five other subalpine meadows (Washburn Lake, Triple Peak, Merced Lake–Shore, Triple Peak–South, and Turner Lake). These signs are likely from stock use prior to 2010, as those meadows have no recorded 2010 stock use.



**TABLE 9-4: STOCK-USE NIGHTS WITHIN SEGMENT 1 BY LOCATION (2004 TO 2010)<sup>a</sup>**

Wilderness Stock Campsite Areas	2004	2005	2006	2007			2008			2009			2010			Total	2004 to 2010	High
	Commercially Guided Pack Trips	Commercially Guided Pack Trips	Commercially Guided Pack Trips	Commercially Guided Pack Trips	Administrative <sup>b</sup>	Total	Commercially Guided Pack Trips	Administrative <sup>b</sup>	Total	Commercially Guided Pack Trips	Administrative <sup>b</sup>	Total	Commercially Guided Pack Trips	Administrative <sup>b</sup>	Total		Average <sup>c</sup>	
Horsethief				12		12	8		8	50		50	21		21	<b>91</b>	13	50
Merced Lake – East					350	350		96	96		410	410	28	300	328	<b>1184</b>	296	410
Washburn Lake	23	36	20				28		28				28		28	<b>135</b>	19	36
Doc Moyle's	19			33		33			0				6		6	<b>58</b>	8	33
Echo		36					20		20							<b>56</b>	8	36
<b>Total</b>	<b>42</b>	<b>72</b>	<b>20</b>	<b>45</b>	<b>350</b>	<b>395</b>	<b>56</b>	<b>96</b>	<b>152</b>	<b>50</b>	<b>410</b>	<b>460</b>	<b>83</b>	<b>300</b>	<b>383</b>	<b>1524</b>	<b>344</b>	<b>460</b>
NOTES: <sup>a</sup> Data shows the number of overnight stays by stock within the river segment. One stock-use night is equivalent to one overnight stay by one head of stock. Concessioner's stock used to supply the Merced Lake High Sierra Camp is not shown in the table. <sup>b</sup> Administrative use within the Merced River corridor was not tracked by NPS staff until 2007. The stock-use night estimates do not include ranger patrols or sawyers but predominantly show stock use providing operational support for the NPS ranger operations and the backpacker campground facilities within Little Yosemite Valley and at Merced Lake. <sup>c</sup> Average is for the stock use between 2007 and 2010. Although an average is presented for each wilderness stock campsite area, one caveat is necessary: year-to-year NPS administrative stock use levels can vary widely based on management and project work performed that year. SOURCE: NPS 2011																		

There are no formal trails present in any of the subalpine meadows surveyed for the study. Most subalpine meadows had little or no informal trails present. Five subalpine meadows had some informal trails present, with Merced Lake–Shore having the most, likely due to its proximity to Merced Lake High Sierra Camp. The study could not differentiate between human and equine trailing on those sites with pack stock use (Ballenger et al. 2011). **Table 9-5** provides details on informal trails in subalpine meadows of the Merced River corridor.

**TABLE 9-5: INFORMAL TRAILS IN SUBALPINE MEADOWS**

Meadow Name	Informal Trails (length in meters)
Doc Moyle's–West	205.8
Doc Moyle's–East	60.6
Little Yosemite Valley–West*	0
Little Yosemite Valley–East	0
Merced Lake–Shore	1,637.5
Merced Lake–West	0
Merced Lake–East*	144.0
Red Peak–North	0
Red Peak–South	0
Triple Peak–North	0
Triple Peak–South	0
Turner Lake	0
Washburn Lake	144.2
NOTE: Includes informal trails within 50 meters of each meadow. * Indicates site was largely inundated at time of survey, so detection of informal trails may not have been possible.	
SOURCE: Ballenger et al. 2011	

**Alpine Plant Communities.** Alpine plant communities within the upper Merced River corridor are limited to alpine snow patch communities. These communities are above tree line dominated by herbaceous vegetation that has adapted to a very short growing season. Sites are seasonally saturated by snowmelt.

**Chaparral Communities.** Chaparral communities along the upper Merced River are characterized by montane chaparral (NPS 1997c). Montane chaparral is most often found on south-facing slopes in the coniferous forest zones. Since the majority of the annual precipitation comes as snow, there is a shorter growing season than in lower elevation chaparral communities. Plant species typical of this diverse community include mountain whitethorn (*Ceanothus cordulatus*), greenleaf manzanita (*Arctostaphylos patula*), chinquapin (*Chrysolepis sempervirens*), bitter cherry (*Prunus emarginata*), buckbrush (*Ceanothus cuneatus*), deerbrush (*Ceanothus integerrimus*), currant (*Ribes* sp.), huckleberry oak (*Quercus vaccinifolia*), mountain mahogany (*Cercocarpus ledifolius*), and lupine (*Lupinus* spp.). Within the alpine and upper subalpine zones, montane chaparral is sparsely vegetated and typically consists of small, low-growing plants at the base of rocks or other semiprotected sites where sediment

and water collect and thin crusts made up of mosses, lichens, algae, and bacteria are present. These organisms form a biotic layer over unvegetated areas between shrubs, grasses, and flowering plants in undisturbed arid and semiarid lands of the world, including the alpine zone of the upper Merced River. These crusts function as soil builders. With a drop in elevation, chaparral plant communities dominate exposed slopes. Species in these areas are often prostrate (low growing), with occasional wind-pruned pines intermixed. Examples of chaparral communities occur near the confluence of the Merced Peak and Triple Peak Forks. Lower-elevation talus and scree fields colonized by dense shrubby trees and chaparral slowly succeed to coniferous forest communities.

**Subalpine Coniferous Forest.** Subalpine coniferous forests are relatively open and exposed, and increase in density along river and stream channels. The forest understory is naturally sparse and ranges from barren rock to sparse shrubs and grasses. The subalpine zone is characterized by long, severe winters and brief, cool summers. Trees in this zone range between 10 and 70 feet in height and are typically long-lived. Intensely strong winds on exposed ridges near treeline cause stunted forests, typically found at timberline, where trees are continually exposed to harsh weather conditions. Lodgepole pine (*Pinus contorta* ssp. *murrayana*) and whitebark pine (*Pinus albicaulis*) dominate subalpine coniferous forests, with mountain hemlock a common associate.

Lodgepole pine forest generally occurs at elevations with long, snowy winters, late-season snowpack, and cool, dry summers. Lodgepole pine often grows in dense, pure or almost pure stands. This species tolerates large variations in soil and moisture, but most commonly occurs on rocky, well-drained soils. At its lower limit, lodgepole is found in valley bottoms, cold basins, and wet areas around meadows surrounded by upper montane coniferous forest. The riparian type occurs at the same elevation with a mixture of understory shrubs and herbaceous perennials, surrounded by red fir. The more abundant xeric type is found on porous, decomposed granite substrate.

Whitebark pine forests occur on shallow, rocky soils just below treeline. The growing season is very short due to long, cold winters, and there is the possibility of snow or frost likely in any month. In many cases, whitebark pine forms pure stands of widely spaced trees. It can also form dense shrub-like krummholz about 3 feet high. Major associates include mountain hemlock and lodgepole pine.

Although Sierra juniper (*Juniperus grandis*) occurs throughout the upper Merced River zone, unusually large specimens of this species occur above Washburn Lake. Typical trees measure 30 feet in height and 6–8 feet in diameter.

**Upper Montane Coniferous Forest.** Western white pine (*Pinus monticola*), Jeffrey pine (*Pinus jeffreyi*), red fir (*Abies magnifica*), sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus decurrens*), lodgepole pine, and mountain hemlock (*Tsuga mertensiana*) dominate the higher elevations above Little Yosemite Valley. The red fir community occurs in the area of greatest snowfall accumulation in the Sierra Nevada. Snow generally remains until June and the growing season is concentrated into mid-summer. The red fir community usually occurs in large stands separated by barren areas, ridges, meadows, and dense stands of lodgepole pine, which occupy poorly drained sites. These dense forests, with frequently overlapping narrow crowns, cast deep shade on the forest floor. The understory is nearly absent and ground cover consists of abundant needle litter and fallen branches. Common associates in the red fir community include white fir, western white pine, and at the upper limit, lodgepole pine.

Western white pine occurs intermittently or as a co-dominant in the red fir community. On a small number of south- or west-facing slopes, it forms the dominant forest cover and may even occur in pure stands. This community generally occupies dry rocky areas and is composed of large, widely spaced trees. Often there is an understory of dwarfed montane chaparral composed of pinemat manzanita (*Arctostaphylos nevadensis*) and mountain whitethorn.

White fir occurs in the 6,000- to 7,000-foot elevation range along the river corridor. The diversity of both forest-dominant and understory species above Little Yosemite Valley exemplifies the variability of vegetation through this zone of the Sierra Nevada range. Understory species in the upper montane coniferous forests include a mix of scrub and chaparral, as well as young conifers and fern dells. Species composition is diminished in localized areas such as Merced Lake High Sierra Camp (denuded understory) and the burn area within Echo Valley (even-aged stands of young conifers).

**Lower Montane Coniferous Forest.** The lower montane coniferous forest along the upper Merced River is dominated by ponderosa pine (*Pinus ponderosa*) at lower elevations and Jeffrey pine at higher elevations, along with other coniferous species such as white fir, incense cedar, and sugar pine. This community favors dry, cold, well-drained sites, especially slopes, ridges, or cold air accumulation basins. In some areas, notably the south-facing slopes below Half Dome, it can form vast stands. In the more xeric and lower elevational limit of its habitat, Jeffrey pine is associated with dense understory stands of chaparral. In more mesic sites, or at higher elevations, it intergrades into upper montane coniferous forest. The plant species composition of the forest varies with elevation, slope, aspect, soils, water availability, and past and ongoing disturbance.

Little Yosemite Valley is dominated by mixed conifer communities of ponderosa pine, incense cedar, sugar pine, and occasional California black oaks and canyon live oaks. The most common understory shrubs are Mariposa manzanita (*Arctostaphylos viscida* ssp. *mariposa*), deerbrush, and bear-clover (*Chamaebatia foliolosa*). With a descent in elevation from the upper reaches of the Merced River into Little Yosemite Valley, the impacts associated with visitor use become more apparent. Forests to the north of the Merced River experience relatively heavy use (along major trail routes and camping sites), typically have little understory vegetation, and are dense with young trees, dead material, and ladder fuels. Forests south of the river receive almost no use and are more rich and pristine in nature. Typical nonnative species in this coniferous forest include European annual grasses, bull thistle, and common mullein.

**Lower Montane Broadleaf Forests.** Lower montane broadleaf forest along the upper Merced River includes areas dominated by California black oak (*Quercus kelloggii*) or canyon live oak (*Quercus chrysolepis*). These areas are not extensive in the upper Merced River corridor and only occur at the lowest elevations of these segments. This forest becomes more widespread at lower elevations. Lower montane broadleaf forests occur as persistent stands dominated by California black oaks or canyon live oaks with scattered pines. Most stands occur on mountain slopes, benches, and canyon bottoms. Primary associate species include white fir (*Abies concolor*), incense cedar, sugar pine, and Jeffrey pine.

**Wetlands and Riparian Habitats.** Numerous small wetland meadows<sup>3</sup> and adjacent riparian habitat are present in the upper reaches of the Merced River corridor above Nevada Fall. These high-elevation

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<sup>3</sup> Not all meadows along the Merced River corridor can be classified as wetlands. For a more general discussion of meadows, please refer to "Meadow Plant Communities" above.

meadows typically occur on fine-textured, permanently to semi-permanently wet soils generally associated with perennial streams, seeps, lake margins, or depressions. Vegetation consists of low-growing, native, tussock-forming grasses, sedges, rushes, and perennial herbs. Within the alpine zone (generally above 9,600 feet — the highest portion of the Merced River’s headwaters), wetland meadows often form thin margins around small glacial lakes. At lower elevations (such as Merced and Washburn lakes), subalpine wetland meadows (7,000–9,600 feet) link the aquatic river and lake habitats with the drier upland forests. In-lake vegetation is typically limited to rooted aquatic grasses, floating vascular plants, and algae. Meadow communities border lake margins, providing important wildlife habitat. These wetland plant communities are hydrologically driven by the groundwater and flooding regime of the Merced River (NPS 1997; Ballenger et al. 2011; Sawyer et al. 2009). For a more detailed discussion of the current condition of meadows in the upper Merced River watershed, please refer to “Meadow Plant Communities” above.

Much of the Merced River above Nevada Fall is bordered by a narrow riparian zone influenced by stream gradient, slope, sedimentation, and aspect. High-elevation tributaries to the Merced River (e.g., Merced Peak Fork and Triple Peak Fork) are sparsely vegetated with scattered patches of alpine riparian scrub and alpine willow thickets. As the river descends and the gradient becomes gentler, lodgepole pines, aspens (*Populus tremuloides*), willows (*Salix* spp.), and alders (*Alnus* spp.) become more prevalent. Willows often colonize where point bars form (at the margins of, or within, the river channel). Riparian species often intergrade with coniferous forest at or near the river’s upper banks (NPS 1997; Sawyer et al. 2009). Riparian communities of the upper Merced River are generally intact, except in a few locations where human use is intense.

### ***Segment 2: Yosemite Valley***

Yosemite Valley is a broad, flat-bottomed valley formed by glaciation and subsequent alluvial deposition. Yosemite Valley is in the lower montane mixed conifer zone, and vegetation is classified into three broad types: meadow, lower montane broadleaf forest, and lower montane coniferous forest. California black oak forest is a major component of the broadly defined lower montane broadleaf forest. Because the NPS considers California black oak a highly valued biological and cultural resource, this community is described separately from other lower montane broadleaf forest communities. There are also areas categorized as barren, which in Yosemite Valley include talus slopes, developed sites, and other unvegetated areas. Along many segments of the Merced River corridor in Yosemite Valley, the river is bordered by a narrow riparian zone and small wetlands. In addition, many of the larger meadows of Yosemite Valley support wetland areas. As mentioned above, even though riparian and wetland areas are not classified independently under the eight broad vegetation types used in the parkwide vegetation map, they are discussed in depth in the “Wetland and Riparian Habitats” section below.

*Fire History of Yosemite Valley:* For more than 4,000 years, traditionally associated American Indians relied on Yosemite Valley’s meadows and oak woodlands to provide food, medicine, and materials for baskets, string, and shelter. Yosemite’s early inhabitants periodically set fires to promote the growth milkweed, dogbane, sedge root, and bunch grass (Gassaway 2005). Pre Euro-American fire regimes were characterized by frequent late season fires that varied in extent from local spot fires to larger burns (Taylor 2006). The presence of large diameter California black oak, ponderosa pine, incense cedar, and

Douglas-fir in photographs of Yosemite Valley taken in the 1860s and 1870s (Gibbens and Heady 1964; Gruell 2001) suggest that surface fires killed mainly seedlings and saplings. Thus, frequent fire promoted development of open forest conditions with a predominance of large diameter trees. When Euro-Americans began living in Yosemite Valley in the 1850s, traditional burning practices were stopped and fire suppression became official policy until the 1970s. Fire was a key disturbance process that influenced forest structure and composition in Yosemite Valley prior to Euro-American settlement. Fire regimes changed dramatically after Euro-American settlement as did the role of fire in shaping vegetation structure and dynamics. The most conservative estimate of how often sites burned during the pre Euro-American period indicates that forested areas in the Valley burned every 11-14 years (Taylor 2006).

**Meadow Plant Communities.** Low-elevation meadows on the Merced River floodplain are hydrologically driven communities that depend on river processes, including the frequency, duration, timing, and magnitude of flooding, and frequent low-intensity broadcast fires. The meadows in Yosemite Valley form transition zones from drier upland and California black oak communities to wetter riparian communities. The aquatic food chain in the Merced River is dependent on a connection with overflow channels in the meadows, which spill over during periods of high water, releasing concentrated food sources into the river.

Meadows in Yosemite Valley are larger in size than most mid-elevation meadows throughout the region and thus are rare and unusual at a regional scale (NPS 1997, **figure 9-10**). In addition, meadows in Yosemite Valley are highly diverse, both from a structural point of view, as the meadows contain a wide variety of microhabitats, and from a species point of view, as the meadows support high numbers of different native plant and animal species. About 30 different sedge species have been collected in Yosemite Valley meadows, which is considered by experts in the genus to be an exceptional degree of diversity (Ballenger et al. 2011). These meadows also support special status animal species, illustrating the exceptional species richness of Yosemite Valley. These attributes combine to make Yosemite Valley's meadows an extraordinary example of a regionally rare ecosystem, and contribute to the river's biological ORV.

The water tables in Yosemite Valley remain at or near the surface throughout the growing season. An accumulation of organic matter is typical in these meadows. Sedges, grasses, and other perennial and annual herbs form a dense cover. The most common sedges in many meadows include rough sedge (*Carex senta*) and wooly sedge (*Carex pellita*); these species occur in the most mesic areas. The most common grasses found in meadows include beardless wild rye (*Elymus triticoides*) and the nonnative Kentucky bluegrass. These grasses occur in dry portions of meadows where surface moisture is depleted during the growing season. Grasses commonly dominate the dense to moderate cover of perennial and annual herbs.

Over the past century the acreage of meadows in Yosemite Valley has decreased (**figure 9-11**) due to conifer encroachment (Gibbens and Heady 1964; Heady and Zinke 1978). Cooper and Wolf (2008) suggested that conifers have likely colonized former meadows for several reasons: (1) the installation of drains, water diversions, and other facilities caused hydrologic changes that lowered the summer water table; (2) the cessation of burning by American Indians allowed tree seedlings to persist; (3) disturbance caused by plowing meadows and planting hay crops and apple orchards allowed conifers to invade the bare soils after the widely rooted, sod-forming meadow species were destroyed; and (4) placement of fill to raise

the ground elevation allowed upland species to invade. The widening of the Merced River — attributable to trampling on riverbanks, subsequent loss of vegetation, and accelerated erosion — also had an effect on natural river processes such as flooding, and natural erosion and sediment deposition (Madej 1991). These processes shape the dynamic habitat that sustains riparian vegetation and supply water to meadow communities.

Historic photos and accounts document the condition of Yosemite Valley meadows in relation to conifer encroachment through time. In 1866, State Geologist J.D. Whitney (1868) mapped 745 acres of meadows in Yosemite Valley. In 1937, NPS type mapping projects calculated 327 total meadow acres in Yosemite Valley. In 2010, botanists mapped 269 total meadow acres, a 64% decrease from the 1866 Yosemite Valley meadow (Ballenger et al. 2011) (**figure 9-11**).

The recently completed *2010 Assessment of Meadows in the Merced River Corridor, Yosemite National Park* (Ballenger et al. 2011) provides details on the current condition of meadow habitats in Yosemite Valley. The study examined a wide variety of attributes including vegetation, wetland extent, bare ground, nonnative species, conifer encroachment, and meadow stream condition. Disturbance from small mammal burrows, informal trails, and pack stock use was also documented.

Mean vegetation cover in Yosemite Valley meadows ranged from 50%–70%, with El Capitan and Leidig meadows having the lowest mean vegetation cover and Cook's Meadow having the highest. The authors found that graminoid species dominated Yosemite Valley meadows, which are a healthy component of meadow vegetation. However, nonnative plant species are common in Yosemite Valley meadows, with the highest extent of nonnatives in Stoneman and El Capitan meadows. The study also compared mean cover of nonnative plants across all meadows for different surface soil moisture categories and found that nonnative plant cover was lowest in saturated and inundated plots. Dry and moist plots had two to three times the cover of nonnative plants as plots with early-season saturated or inundated soils. Because El Capitan and Stoneman Meadows also had the lowest proportion of wetland area of Yosemite Valley meadows, the study suggests a connection between the extent of perennially wet soils and nonnative species in Yosemite Valley. Kentucky bluegrass was the most common nonnative recorded, which outcompetes native meadow species when soil moisture is reduced (Martin and Chambers 2001; Kluse and Allen-Diaz 2005). So far, most nonnative plants currently present in Yosemite Valley meadows are not well adapted to outcompete native plants in the wettest portions of the meadows with the exception of Kentucky blue grass and velvet grass (*Holcus lanatus*), and aggressive non-native plant which prefers wet conditions and is already established in Yosemite Valley). Close attention to early detection and eradication of nonnative meadow plants will help keep additional species and populations from encroaching into wetlands, and maintaining and restoring the hydrologic regime of Yosemite Valley meadows may help sustain native meadow vegetation (Ballenger et al. 2011).

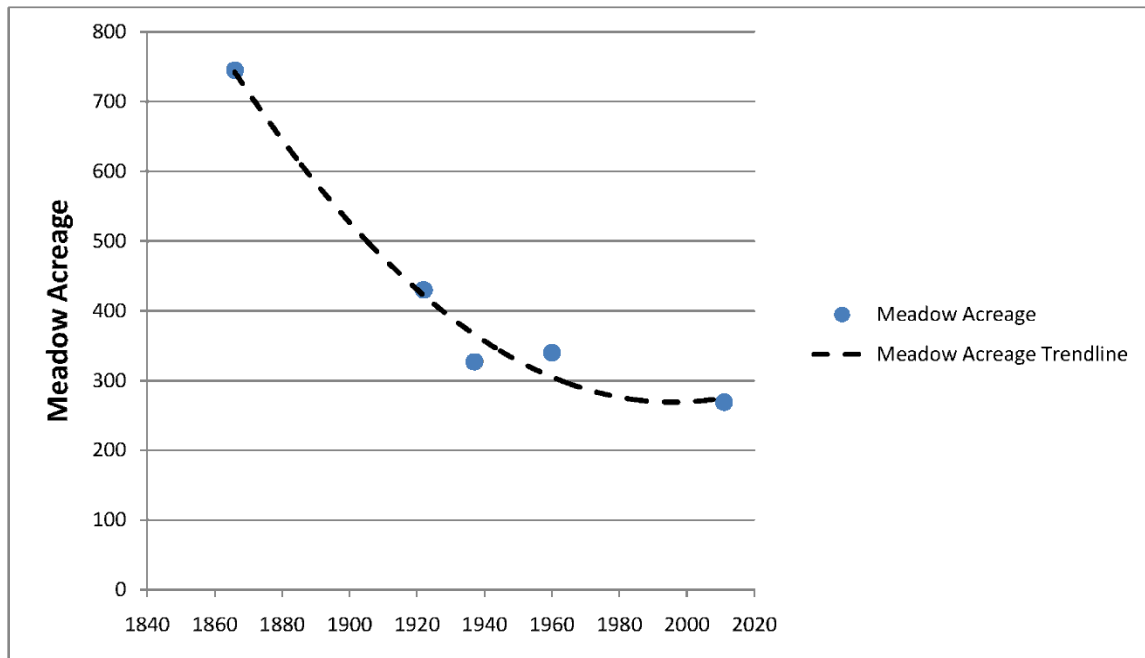
Across all Yosemite Valley meadows surveyed, 50% of plots were considered wetlands under the Cowardin standards, based on dominant plant species and wetland indicator ratings. Leidig, Cook's, and Sentinel meadows had the highest proportion of wetland plots (84-86%). El Capitan and Stoneman meadows had the lowest proportion of wetland plots, with 50% and 52% respectively. Conifer seedlings are more frequent in El Capitan and Stoneman meadows than in Leidig and Sentinel meadows, presumably due to a longer inundation period in the latter set of meadows. The seedlings of many tree species cannot survive long periods of inundation (Koxlowski 1997).





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SOURCES: Whitney 1868; Gibbens and Heady 1964; Heady and Zinke 1978; Cooper and Wolf 2008; Ballenger et al. 2011.

**Figure 9-11**  
Meadow Acreage in Yosemite Valley  
(1866-2011)

Informal trails are common in Yosemite Valley. The *2010 Assessment of Meadows in the Merced River Corridor, Yosemite National Park* (Ballenger et al. 2011) found that bare ground from informal trails was highest in El Capitan, Sentinel, and Bridalveil meadows. Cook's and Stoneman meadows had the lowest levels of bare ground from informal trails, possibly due to the presence of elevated boardwalks that concentrate visitor foot traffic, discouraging visitors from venturing cross country through the meadows and mitigating trampling effects. Although the meadows of Yosemite Valley have experienced a variety of human-related impacts over the past 150 years, the remaining meadows are still largely intact and are some of the most ecologically valuable meadows in the Sierra Nevada. The NPS is implementing a number of management programs to restore meadow communities along the Merced River within Yosemite Valley, including prescribed burning, treatment of nonnative plant populations, and restoration of native plants. For example, tens of thousands of conifer seedlings and saplings were removed from Yosemite Valley meadows in the last decade. Populations of high-priority nonnative species, such as Himalayan blackberry (*Rubus armeniacus*), bull thistle, St. John's wort (*Hypericum perforatum*), and velvet grass, were mapped and many of these populations were treated (Ballenger et al. 2011).

Other beneficial projects include the Cook's Meadow Restoration Project and the Eagle Creek Restoration Project, which were specifically designed to enhance meadow and riparian habitat. The Cook's Meadow project restored meadow hydrology by filling ditches and removing an abandoned roadbed. The Eagle Creek Restoration Project enhanced riparian streambank integrity by recontouring and revegetating eroded streambanks, de-compacting soils, and constructing fencing to direct visitors to areas that could accommodate higher levels of use such as sandbars. In Cook's Meadow, the NPS excavated paved interpretive trails that crossed the meadow and replaced them with elevated boardwalks. In Sentinel Meadow, the NPS constructed one boardwalk and fencing along the strip

parking area, helping to discourage the use of 29 informal trails by delineating access. Similarly, in Stoneman Meadow, the NPS constructed a boardwalk across the meadow to further discourage the use of 25 informal trails.

**Lower Montane Broadleaf Forest.** Lower montane broadleaf forest in Yosemite Valley includes areas dominated by California black oak or canyon live oak. This community is transitional between low-elevation broadleaved forests and higher elevation coniferous forests. Canyon live oak communities grow on both north- and south-facing talus slopes and often form pure or almost pure stands. Fires in this community are infrequent but intense, with a fire return interval of 20–50 years on south-facing slopes. Most trees and shrubs in this community crown sprout after fire.

**California Black Oak Stands.** California black oak stands are considered a subset of the lower montane broadleaf forest. They are discussed independently here because they are considered a key element of the river's cultural ORV.

Black oak acorn has been an important staple food for Indian people in Yosemite Valley for millennia (Anderson 1991; Hull and Moratto 1999). According to Bibby (1994:17), its historic importance is likely one reason why acorn, and the cultural knowledge regarding its preparation, has survived strongly among the contemporary associated tribes and groups. Although it is no longer a staple food, it has become symbolic of ancestral traditions and an important aspect of contemporary culture. For example, acorn soup is prepared for special occasions, especially traditional gatherings and ceremonial events. Several of the former inhabitants recall gathering acorn with their parents and/or grandparents, attesting to the multi-generational historical and place-based personal connections between black oaks and the people. Certain groups of trees, or even individual trees, continue to be associated with particular individuals who gathered in historic times (Bibby 1994:22).

California black oaks in Yosemite Valley form open stands of large, stately trees with an herbaceous understory. These stands are unique to the valley due to thousands of years of anthropogenic activities, including annual burning and removal of young conifers, and are found at the change in slope between upland colluvial deposits and lower meadow, water-driven alluvial areas. They form a band or ring of oaks around the valley floor, between the upland forest communities and the lower-lying meadow and riparian communities, totaling approximately 126 acres. California black oak stands mixed with ponderosa pine are found throughout the valley, and areas of California black oak with development are found in the east Valley, totaling an additional 280 acres. California black oaks also grow in dense stands on talus slopes near drainages.

The current structure of the California black oak population in Yosemite Valley follows a familiar pattern for oak species throughout California – a more or less predicted frequency distribution of adults but few to any saplings and young adults, but usually many young seedlings. California black oak communities in Yosemite Valley have experienced a decline in population size, density, vigor, recruitment rates, and stand structure. The decline has been caused by changes in natural or cultural fire processes, encroachment by conifers, browsing by deer and rodents, and from development and unmanaged visitor use in the early and mid-20th century (Fritzke 1997). Oak woodlands are also some of the most ecologically transformed terrestrial ecosystems in the Sierra Nevada due to alterations of

natural processes, development, and introduction of nonnative species. The conversion of oak woodlands has also had a substantial effect on wildlife species (UC Davis 1996).

California black oak communities are adapted to frequent low-intensity fires, similar to upland mixed conifer communities. Under natural conditions, the return interval for fire is estimated at 8–12 years (NPS 1990). The disruption of natural and aboriginal fire regimes has led to the rapid decline of black oak woodlands in the park (Angress 1985). Nonnative plant species have also become established in California black oak communities. Species include annual grasses, black locust (*Robinia pseudoacacia*), and extensive ground-covering stands of Himalayan blackberry.

**Lower Montane Coniferous Forest.** Mixed conifer communities are normally dominated by ponderosa pine and generally grow at elevations of 3,000–5,000 feet. This habitat also contains incense cedar, sugar pine, and occasional California black oaks. The most common understory shrubs are Mariposa manzanita, deerbrush, and bear-clover.

The mixed conifer community is naturally adapted to low-intensity, frequent fires. Nearly 100 years of fire suppression has resulted in a change from open forest to dense thickets of shade-tolerant tree species, including incense cedar, white fir, and Douglas-fir (*Pseudotsuga menziesii*). Under natural conditions, the return interval for fire is estimated at 8–12 years (NPS 1990). Present conditions, however, often generate fires of much greater intensity than under a natural fire regime. The intensity of the 1990 A-Rock Fire in the Foresta area was partially due to these conditions. Most undeveloped, mixed conifer areas of Yosemite Valley are now managed through a combination of mechanical removal of hazardous fuel and prescribed burning. These treatments simulate the natural and anthropogenic fire regimes of the Valley and help decrease stand densities to more natural levels.

In Yosemite Valley, the extent of the annosus root disease is unusual; there are only a few other large populations of this species of root rot on the western side of the Sierra Nevada (NPS 1998B). Annosus root disease is a widespread native fungus. In pines, the fungus first spreads through the root system, attacking the inner bark and sapwood, killing these tissues. Within 2 to 6 years after initial infection, the fungus reaches the root crown and girdles the tree. The tree dies, but the fungus remains active as a saprophytic, wood-decaying organism within roots and the butt of the dead tree and spreads to the root systems of adjacent trees. This fungus also spreads more readily in tightly spaced trees.

Yosemite has unnaturally dense stands of conifers in former California black oak, meadow, and riparian areas that have a high water table and frequent flooding. The conifer forest in Yosemite Valley may not be sustainable because of these unusually large centers of annosus. Significant annosus infestation centers in Yosemite Valley include former Upper River and Lower River campgrounds and Yellow Pine Campground, portions of Yosemite Lodge, and most of the Taft Toe area. Existing annosus centers in developed areas can be mitigated by landscaping with species that are not susceptible to infection, such as California black oak, canyon live oak, and big-leaf maple.

Nonnative, or introduced, plant species have become established in the mixed conifer zone, although not to the extent they have in meadows and California black oak communities. These species are the result of either deliberate or accidental introductions and are not part of the naturally evolved community. Many of these are indicators of past agricultural activities that occurred throughout the area. Approximately 180 nonnative species have been identified in the park, primarily in the

chaparral/oak and mid-elevation forests (Fritzke and Moore 1998). In the upland plant communities of Yosemite Valley, nonnative species are generally herbaceous and associated with ground disturbance (one-time or recurring). Typical species include European annual grasses and bull thistle.

**Wetlands and Riparian Habitats.** Wetlands in Yosemite Valley are formed in low-gradient land adjacent to the Merced River, its tributaries, or other bodies of water that are, at least periodically, influenced by flooding or high water tables.

Wetlands within Yosemite Valley have undergone systematic alteration since the middle of the 19th century as they were grazed, farmed, and used as recreational sites and corridors for travel. One of the earliest impacts on wetlands in Yosemite Valley occurred in 1879, with the blasting of El Capitan moraine in the west Valley. This action lowered the base hydrologic level and caused the Merced River to downcut several feet (Milestone 1978; NPS 1992). Vegetation in adjacent wetlands was probably altered, and wetland function would have been further compromised by actions designed to dewater these areas. Impacts on wet meadows would have been most severe immediately upgradient of the blast (El Capitan Meadow) and from that point upstream. The blasting of the moraine would have had minimal impact on Sentinel, Cook's, Stoneman, and Ahwahnee meadows.

Other alterations that took place in the early 20th century include drainage ditches that were constructed to dewater wet meadows to reduce mosquito breeding areas and provide open land for grazing and agriculture. Many of these drainage ditches remain in place and continue to dewater meadows in Yosemite Valley. Road construction has involved drainage measures and diversion of surface water adjacent to many of the valley's wetlands. Wetlands are fragmented by roads, trails, and infrastructure. This wetland complex was formerly much more interrelated and contiguous. Evidence of the impact of roads can be seen in Sentinel, El Capitan, and Stoneman meadows.

Riparian zones in Yosemite Valley extend outward from bank edges of the Merced River and its tributaries into adjacent meadow and forest communities. Riparian ecosystems play a critical role in a variety of processes. Situated at the interface between terrestrial and aquatic ecosystems, the riparian zone acts to buffer hydrology and erosional cycles, control and regulate biogeochemical cycles of nitrogen and other key nutrients, limit fire movements, and create unique microclimates for animal species (Rundel and Stuner 1998).

Riparian zones in Yosemite Valley are characterized by broadleaf deciduous trees, such as white alder (*Alnus rhombifolia*), black cottonwood (*Populus trichocarpa*), big-leaf maple (*Acer macrophyllum*), white fir, and willow species. Riparian areas within the valley are rich in species diversity and structure. Riparian vegetation is regularly disturbed by the deposition and removal of soil and the force of floodwaters. Plants in this zone colonize newly formed river-edge deposits readily. The distribution of riparian communities varies with soil saturation and frequency of disturbance. For example, big-leaf maple riparian forests grow on moist gravelly soils in protected spots on alluvial soils bordering streams, whereas sandbar willow woodlands occur on point and mid-channel bars that are washed over annually by spring floods (NPS 1994b).

Riparian communities are among the most productive and biologically diverse in Yosemite Valley. For much of the 20th century, these areas were among the most affected due to their proximity to water and the effects of trampling and the installation and maintenance of aboveground and belowground

infrastructure, which caused dewatering of riparian areas. Restoration efforts have generally been successful at improving the overall condition of the Valley's riparian communities. However, certain riparian areas within the Valley continue to experience impacts. For example, NPS staff continues to observe vegetation trampling and bank erosion from heavy use along the following areas: between El Capitan Bridge and Clark's Bridge, Clark's Bridge and Sentinel Bridge, and Happy Isles Road Bridge and Clark's Bridge; Cathedral, Swinging, Sentinel bridge picnic areas; and around the Upper Pines and Lower Pines Campgrounds and Housekeeping Camp. Additional riparian vegetation impacts are occurring along reaches that have been armored by revetments or other defensive structures for the protection of structures (i.e., bridges).

Primary stressors on the condition of riparian habitats along the Merced River are related to high recreation use, channel stabilization measures, and dewatering due to infrastructure. Measures to stabilize the channel were implemented to limit channel migration in areas where bank erosion was observed to protect infrastructure, property, and public safety. These measures, including constructing bank revetments and clearing channels of large wood, channelized the river and reduced riparian habitat complexity. Riparian wetlands along some reaches are also affected by the proximity of roads, bank protection measures that have been installed to protect roads, and numerous turnoffs and parking areas that provide easy access to the riparian corridor and the river. The recently completed *Merced River and Riparian Vegetation Assessment* (NPS 2011) evaluated the current condition of eight geomorphic reaches of the Merced River and its riparian corridor in Yosemite Valley by using a variety of different methods. The study found that riparian and wildlife habitat conditions along the Merced River through Yosemite Valley varied by geomorphic reach, and that these variations were caused by responses to assorted types of impacts. For example, the reach just below Happy Isles has wide riparian buffers with complex physical structure and provided good wildlife habitat. Conversely, the stretch just below Tenaya Creek had narrow riparian buffers and low vegetation structural complexity, providing poor wildlife habitat. The study found that the primary causes of decline of the riparian corridor along the Merced River riparian corridor were related to recreation use and the presence of infrastructure, which can limit the development of the riparian forest (NPS 2011). This same study observed evidence of at least moderate levels of human use throughout most of the study reaches. Areas with moderate to high levels of human use were concentrated near the developed areas between Clark Bridge and Sentinel Bridge and areas easily accessible from adjacent roads. Bank erosion was observed throughout the study reaches, particularly near bridges, recreation facilities, and around some meander bends. Areas with moderate to high human use also generally had fewer co-dominant species and generally exhibited lower riparian community structure complexity (NPS 2011).

Over the past two decades, the NPS has undertaken numerous efforts to restore the underlying natural processes that sustain wetlands and riparian habitats in Yosemite Valley. These efforts include prescribed burns, invasive plant eradication, fencing, and increasing inundation levels through restoration of natural drainage patterns, among others. A more detailed description of past and present restoration projects is included in the *Merced River and Riparian Vegetation Assessment* (Cardno ENTRIX 2011) and the *Assessment of Meadows in the Merced River Corridor* (Ballenger et al. 2011). These efforts have been successful in improving the overall condition of riparian areas throughout the Valley. However, these reports also identify a number of persisting stressors on the



Valley's wetlands and riparian ecosystems, such as roads, parking areas, structures, campgrounds, and informal trails, which remain to date and are the focus of ongoing park management efforts.

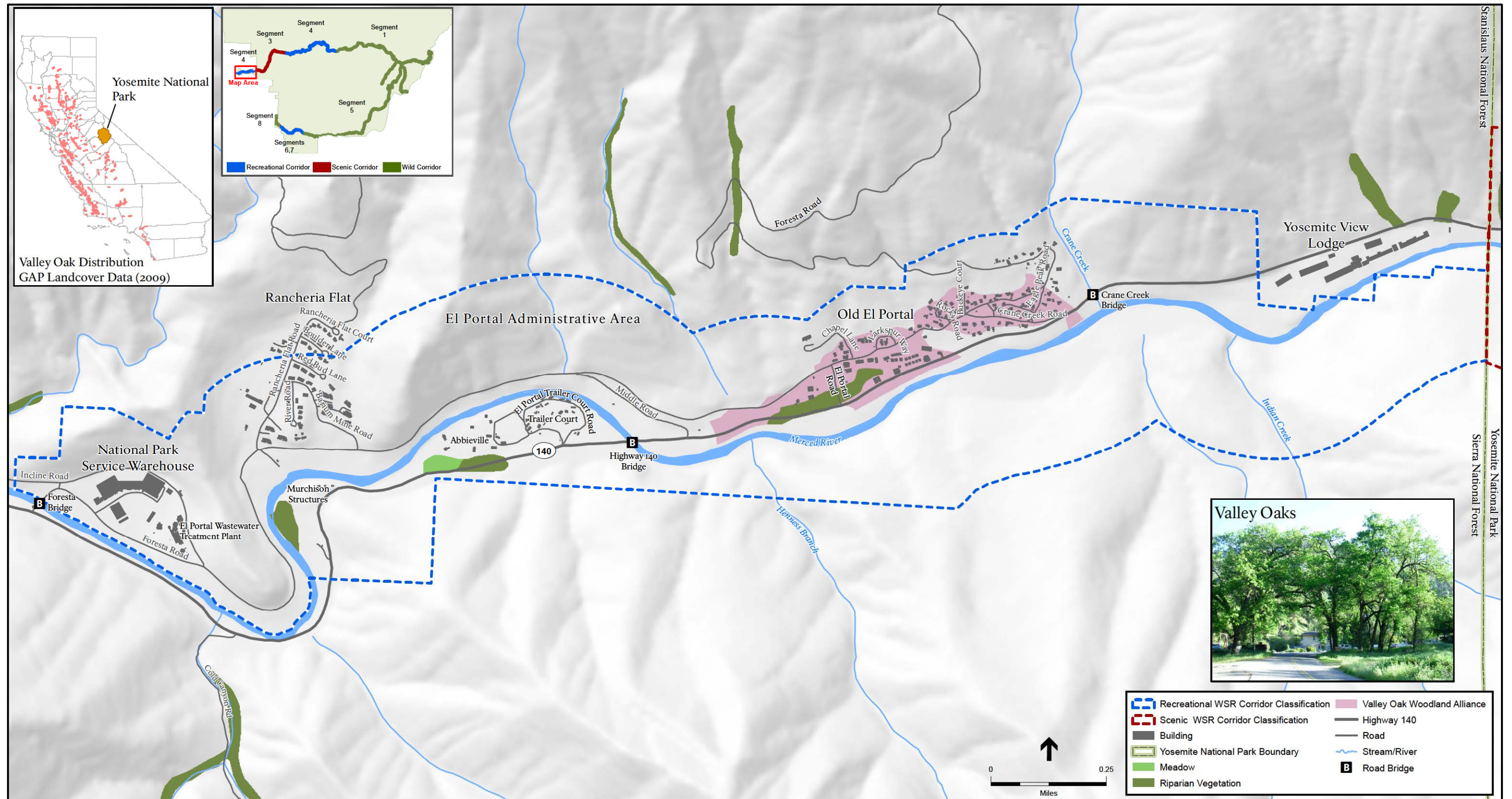
### ***Segments 3 and 4: Merced Gorge and El Portal***

The Merced Gorge travels through the lower montane forest zone and into the foothill-woodland zone, where it enters the El Portal area. Vegetation in the Merced Gorge and El Portal river corridor is classified into four broad vegetation types: chaparral, foothill woodland, lower montane broadleaf forest, and lower montane coniferous forest. Valley oak (*Quercus lobata*) woodland occurs in the El Portal area (**figure 9-12**). This community is an element of the broadly defined foothill woodland. Because the valley oaks in El Portal are a regionally rare species, this community is described separately from other foothill woodland communities. Along these segments, there also are areas categorized as barren, which include talus slopes, unvegetated riverine flats, exposed rock, and other unvegetated areas. There is a narrow band of riparian vegetation along the river course through the Merced Gorge, which is bordered by a dense mosaic of chaparral and forest and woodland communities on the steep canyon walls. As mentioned above, even though riparian and wetland areas are not classified independently under the eight broad vegetation types used in the parkwide vegetation map, they are discussed in depth in the "Wetland and Riparian Habitats" section below.

All of the communities in this area are adapted to frequent natural fires. Fire suppression has led to increased density of vegetation, especially on north-facing slopes. In 1990, the A-Rock Fire burned the south-facing slope directly above El Portal. Natural fires probably burned every 5–10 years in grassy areas, and every 25–40 years in chaparral areas (van Wagtenonk 1994).

**Chaparral Communities.** Chaparral communities along the Merced Gorge are largely confined to the canyon sides and open rocky areas. These areas are dominated by evergreen, thick-leaved species. The major components of this community are foothill pine (*Pinus sabiniana*), canyon live oak, interior live oak (*Quercus wislizeni*), Mariposa manzanita, deerbrush, whiteleaf manzanita (*Arctostaphylos viscida*), buckbrush, yerba santa (*Eriodictyon californicum*), and mountain mahogany. There is often a considerable accumulation of leaf litter with little or no understory vegetation. Chaparral communities often occur on rockier soils than adjacent foothill-woodlands or lower montane coniferous forests. The metamorphic rock formation that crosses the South Fork Merced River downstream of Wawona is home to several species of plants that are both rare and apparently specific to this substrate type. This same formation crosses the main stem of the Merced River at El Portal, and also is home to rare plant species, including state-listed ones (*Allium yosemitense*, *Lewisia congdonii*, *Eriophyllum congdonii*), in the vicinity of the river.

**Foothill Woodlands.** Foothill woodland communities include interior live oak woodland, foothill pine-oak woodland, and interior live oak chaparral. Interior live oak woodland is dominated by interior live oak; however, blue oak (*Quercus douglasii*), California buckeye (*Aesculus californica*), and California bay (*Umbellularia californica*) are also important. Ponderosa pine occurs as a common associated species. Typically dense canopies and abundant, persistent leaf litter occur on dry, rocky slopes with little soil development.



SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-12**  
Segment 4 - Valley Oak Woodlands

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Foothill pine–oak woodland is largely confined to the canyon sides and open rocky areas. It is dominated by evergreen thick-leaved species. The major components of this community are foothill pine, canyon live oak, interior live oak, Mariposa manzanita, deerbrush, buckbrush, and mountain mahogany. The vegetative cover is sparse and discontinuous, with an open canopy of emergent foothill pine or an understory of nonnative grasses and an abundance of native annual herbs.

**Valley Oak Stands.** Valley oak stands are considered a subset of the foothill woodland community.

Six species of oak grow in El Portal. One particularly noteworthy species is the valley oak, described in the next paragraph. The oak canopy provides shade, scenery, and wildlife habitat. The shrub layer retains many native elements such as western redbud (*Cercis occidentalis*), California buckeye, Mariposa manzanita, and yerba santa. Undeveloped areas often support a grassy understory that consists of mostly nonnative grasses along with native wildflowers. Yellow star-thistle (*Centaurea solstitialis*), tocalote (*Centaurea melitensis*), and other extremely invasive species have recently become established in part of the understory flora. Historic and current development and landscaping have introduced many other nonnative species into this community, including the invasive tree-of-heaven (*Ailanthus altissima*), French broom (*Genista monspessulana*), and numerous herbaceous lawn grasses. Fruit trees and other landscape trees are also common. Programmatic efforts to reduce or control the spread of invasive species have been in place in Yosemite for several years.

Valley oaks are a keystone species in floodplain riparian habitats throughout California. A keystone species is one whose impact on its community or ecosystem is disproportionately large relative to its abundance or total biomass. Endemic to California, valley oak populations have experienced a widespread decline throughout the state. The California Native Plant Society considers the valley oak plant community, or *Quercus lobata* alliance, as rare and threatened throughout its range (Sawyer et al. 2009). Yosemite is home to one valley oak population, at the El Portal Administrative Site. This population is unique, as it is geographically isolated from most remaining populations centered in the Great Central Valley of California and lies at the extreme eastern boundary for the species' range.

The El Portal valley oak population contains trees with sizes ranging from small to very large (up to approximately 140 centimeters in diameter). Various factors limit the establishment of valley oaks in potential habitat in El Portal. For example, the dirt parking lot across from the train exhibit has expanded with cars parking under the dripline of mature oaks and grading has occurred in the area. The establishment of new oaks is also likely retarded by deer browsing. The understory of the valley oak population is heavily impacted, and an invasion of nonnative Himalayan blackberry exacerbates the issue. An additional stressor to the valley oak population is the loss of overbank flooding in the El Portal floodplain, due primarily to construction of the Yosemite Valley Railroad terminus and Highway 140 (Howard 1992). Despite these issues, the core population retains sufficient integrity as a vegetation community to be classified as valley oak woodland in Yosemite's parkwide vegetation map.

**Lower Montane Broadleaf Forest.** Lower montane broadleaf forest in the Merced Gorge includes areas dominated by canyon live oak and interior live oak, with scattered groves of California black oak. This community is transitional between foothill woodlands and coniferous forests. Interior live oak forest is dominated by interior live oak in a dense evergreen forest that forms a closed canopy. It ranges in site characteristics from broad alluvial riverbanks to steep, rocky south-facing slopes at lower

elevations. Most pure stands of interior live oak are small and appear to be seral stages of oak woodland with little herbaceous cover. Common associated species include foothill pine, canyon live oak, and blue oak. Understories tend to be brushy with characteristic species consisting of California buckeye, western redbud, and poison-oak (*Toxicodendron diversilobum*). Canyon live oak forest is typically found on rocky, steep slopes with little soil development in canyons on north-facing slopes at relatively low elevations, and on south-facing slopes at higher elevations. Canyon live oak often forms pure or almost pure stands covering several hundred acres with little understory. Associated species include incense cedar and California bay.

**Lower Montane Coniferous Forest.** Mixed conifer communities in the Merced Gorge are dominated by ponderosa pine and Douglas-fir. This habitat also contains incense cedar, sugar pine, and occasional California black oaks. The most common understory shrubs are Mariposa manzanita, deerbrush, and bear-clover. Areas where ponderosa pine are the dominant tree species often occur on south-facing slopes. Co-dominant species include incense cedar, sugar pine, white fir, California black oak, and canyon live oak. Shrubs such as whiteleaf manzanita and mountain whitethorn frequently occupy forest openings. Douglas-fir is typically dominant on steep north-facing canyon sides, but co-dominants can include white fir, incense cedar, ponderosa pine, and canyon live oak. The understory is typically sparse with canopy openings providing habitat for shrubs and perennial herbs.

**Wetlands and Riparian Habitats.** As the Merced River cascades through the gorge, the channel gradient and bank slopes steepen, the river channel narrows, and the floodplains become considerably smaller than those of the Yosemite Valley. Along this stretch of river, the riverbed and banks are comprised largely of boulders and cobbles, ranging in size from a few inches to several feet in diameter. The steep gradient, combined with the boulders and cobbles of the riverbed and bank, forms a series of continuous rapids between Yosemite Valley and El Portal. The Merced Gorge is lined with a narrow band of riparian vegetation along the river course.

Flooding has been an important aspect of the development of riparian communities along the Merced River and its tributaries that intersect drier adjacent vegetation types of El Portal. Localized seasonal flooding creates debris dams in tributary channels, thus furthering a diversity of scour and depositional soils for riparian species. On the Merced River, natural flooding and vegetative patterns are influenced by the construction of levees and application of riprap to confine the river. These structures have destroyed riparian vegetation and have limited their reestablishment in some places.

In the El Portal area, riparian communities occur along tributaries of the Merced River, on flat topographical shaded terraces above the river, in backwater channels, and in areas where runoff from upland sites collects in natural depressions. Native willows, Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), and Oregon ash (*Fraxinus latifolia*) trees occur in wetter areas, as well as orchard components in some locations. Foothill pines and valley oaks tend to dominate the drier terraces adjacent to riparian sites.

Oxbows, river terraces, and seasonal river channels were a part of the riparian wetlands of the area, but have been affected by early to mid-20th century development in what is now the El Portal Administrative Site. Many of the sites that would be characterized as palustrine have been affected to some degree. For example, the wetland near Odger's Pond and the Abbieville wetland appear to

consist of oxbows or backwater channels that were cut off from hydrologic flows of the main stem of the Merced River during construction of Highway 140 in the 1920s (ESA 2004a). These areas continue to maintain palustrine wetland characteristics and riparian vegetation. They are likely connected to the Merced River in the underground water table and not through surface flows. The remaining wetland areas that appear on the USFWS (1995) wetland inventory are riverine perennial wetlands and are in proximity to the Merced River or other stream drainages. Direct human intrusion into the riparian areas of this river zone, especially to the south, is minimal because of the topography and difficulty of access.

### ***Segments 5 and 8: South Fork Merced River Above and Below Wawona***

These segments include nearly a full range of environments typical to the Sierra Nevada. Vegetation zones along the upper South Fork Merced River (Segment 5) include the alpine, subalpine, upper montane forest, and lower montane forest zones. Vegetation in the upper South Fork Merced River is classified into six broad vegetation types: meadow, chaparral, lower montane broadleaf forest, lower montane coniferous forest, upper montane coniferous forest and subalpine coniferous forest. There are also areas categorized as barren, which include talus slopes, permanent snowfields, boulder fields, rock outcrops, and other unvegetated areas.

Vegetation zones along the lower South Fork Merced River (Segment 8) include the lower montane forest and foothill-woodland zones. Vegetation in the lower South Fork Merced River is classified into three broad vegetation types: chaparral, lower montane broadleaf forest, and lower montane coniferous forest. These segments of the river are designated as Wilderness.

As mentioned above, even though riparian and wetland areas are not classified independently under the eight broad vegetation types used in the parkwide vegetation map, they are discussed in depth in the “Wetland and Riparian Habitats” section below.

**Meadow Plant Communities.** Meadow plant communities along the upper South Fork Merced River (Segment 5) range from small, isolated alpine meadows at high elevations to moderately sized meadows along the river corridor. Alpine and subalpine meadows along the South Fork Merced River are similar in composition to those described for the upper Merced River zone (Segment 1). The lower South Fork (Segment 8) does not support meadow communities.

**Chaparral Communities.** Alpine and subalpine chaparral communities along the upper South Fork Merced River are similar in composition to those described for the upper Merced River zone (Segment 1). Steeper canyon slopes above the upper South Fork Merced River, as well as the steep canyon slopes along the South Fork Merced River below Wawona, are dominated by montane chaparral, which contain a variety of manzanitas, ceanothus species such as buckbrush and deerbrush, chinquapin, mountain mahogany, huckleberry oak, and interior live oak.

**Lower Montane Broadleaf Forest.** Lower montane broadleaf forests along the upper South Fork Merced River are similar in composition to those described for the upper Merced River zone (Segment 1), although these communities are more widespread in Segment 5, especially toward the lower elevations of this segment. Similarly, lower montane broadleaf forests along Segment 8 are comparable to those discussed for Segments 3 and 4.



**Coniferous Forest Communities.** Coniferous forest communities along the upper South Fork Merced River are classified as subalpine, upper montane, and lower montane. Coniferous forests along the upper South Fork Merced River are rich in species (both over and understory) and are comparable in conditions to the forest communities described as occurring above Little Yosemite Valley within the upper Merced River (Segment 1). High elevations are dominated by whitebark pine, lodgepole pine, red fir, and aspen. The upper reaches of the canyon are narrow. The forest is relatively sparse through this zone, with most trees and forest species occurring along joints or gaps in the granite. Ponderosa pine and Douglas-fir are dominant at lower elevations along Segment 8, with incense cedar, sugar pine, and California black oak occurring as sub-dominants. The characteristics of the coniferous forests along the lower South Fork Merced River are similar to those in Segments 3 and 4.

**Wetlands and Riparian Habitats.** From its headwaters, the South Fork Merced River flows west at a relatively consistent but steep gradient through a glaciated alpine environment and then enters a V-shaped, unglaciated river valley. The upper South Fork Merced River supports limited riparian vegetation, primarily due to steep topography and high-velocity flows. The steep gradients along the upper and lower South Fork Merced River are not conducive to the establishment of an extensive riparian zone. Typical riparian species — willow, alder, aspen, and maple — are restricted to a narrow fringe along the river. High-elevation tributaries to the South Fork Merced River are either unvegetated, high-velocity, and rocky in nature or are only sparsely vegetated. Subalpine meadows along the South Fork Merced River are similar in composition to those described for the upper main stem of the Merced River. Vegetation in alpine lakes is typically limited to rooted aquatic grasses, floating vascular plants, and algae. The upper South Fork Merced River is generally pristine and remains virtually undisturbed by human-related effects. The steep gradient below Wawona along the South Fork Merced River prevents the establishment of an extensive riparian zone. The limited riparian vegetation along the lower reach remains relatively untouched by human intrusion. The riverbed and banks are largely composed of boulders and cobbles.

#### *Segments 6 and 7: Wawona – Vegetation*

Major vegetation zones in the central South Fork Merced River (Wawona) include the upper montane forest and lower montane forest zones. Vegetation in the central South Fork Merced River is classified into four broad categories: meadow, chaparral, lower montane broadleaf forest, and lower montane coniferous forest. As mentioned above (see Merced River Wetlands and Riparian Vegetation), even though riparian and wetland areas are not classified independently under the eight broad vegetation types used in the parkwide vegetation map, they are discussed in depth in the “Wetland and Riparian Habitats” section below.

**Meadow Plant Communities.** Wawona Meadow is an approximately 200-acre low-elevation meadow, the largest such meadow in Yosemite National Park. Unlike most low-elevation meadows in the park, conifer encroachment in Wawona Meadow is minimal. 44 acres of the lower portion of Wawona Meadow lies in the Merced River corridor and was converted into a nine-hole golf course in 1918. This area continues to be maintained as a golf course and also serves as a sprayfield for reclaimed water. Human alterations in the upper portion of the meadow include the construction of ditches in 1936 that dewater the meadow. The NPS is presently completing an ecological restoration project to fill these ditches and restore natural hydrology.



**Chaparral Communities.** Chaparral along the central South Fork Merced River (Wawona) is very limited and consists of small patches on south-facing, steep canyon walls above the north bank of the river. These patches are comprised of birchleaf mountain mahogany (*Cercocarpus betuloides*), buckbrush, and whiteleaf manzanita. The metamorphic rock formation that crosses the South Fork Merced River downstream of Wawona is home to several species of plants that are both rare and apparently specific to this substrate type. This same formation crosses the main stem of the Merced River at El Portal, and also is home to rare plant species, including state-listed ones (*Allium yosemitense*, *Lewisia congdonii*, *Eriophyllum congdonii*), in the vicinity of the river.

**Coniferous and Broadleaf Forest Communities.** Forest communities in the Wawona area include lower montane coniferous and deciduous forests. Humans have affected parts of Segment 6 and 7 since the turn of the century, and this has affected forest health and composition. Ponderosa pine is dominant in the Wawona area, with incense cedar, sugar pine, and California black oak occurring as sub-dominants. The understory is composed of shrub species such as manzanita, deerbrush, and bear-clover. This community is naturally adapted to frequent low-intensity fires; however, 100 years of fire suppression has resulted in a change from an open forest to dense thickets of trees in many areas. Under natural conditions, the fire return interval is estimated at 8–12 years (NPS 1990). Present conditions can generate fires of much greater severity than those under a natural fire regime. Fire management in Segment 7 is complicated by the numerous residences, private lands, and historic structures located within the Wawona segment of the corridor.

**Wetlands and Riparian Habitats.** In the Wawona area, Big Creek meanders through Wawona Meadow before reaching the South Fork Merced River. Wawona Meadow is a large floodplain meadow (part of a shallow alluvial valley) and has substantial gravel bars within the channel. In the portions where the gradient is gentlest, riparian vegetation (willows and alders) becomes more prevalent. Willows often colonize sandbars that are deposited at the margins of or within the river channel. In this area, the riparian corridor resembles the riparian corridor seen along the Merced River as it flows through Yosemite Valley. As with certain points within Yosemite Valley, trampling of riparian vegetation and associated erosion does occur in this area, resulting from heavy use in the vicinity of Wawona and the Wawona Campground.

Also found in this area is Sierra sweet bay (*Myrica hartwegii*), a shrub endemic to the Sierra Nevada. In Yosemite National Park, Sierra sweet bay is found at the average high water line of the South Fork Merced River downstream from Wawona and along Big Creek, a tributary to the South Fork Merced River (NPS 2012a). Portions of two sizeable populations of Sierra sweet bay occur in the park, one on the South Fork of the Tuolumne River and one on Big Creek and on the South Fork Merced River below the mouth of Big Creek. Both populations have been documented with herbarium specimens over the past 100 years. The NPS (2002) considers Sierra sweet bay a sensitive species, and the California Native Plant Society (CNPS Rank 4.3) identifies the plant as being of limited distribution. For these reasons, this rare plant has been identified as contributing to the river's biological ORV. Sierra sweet bay is discussed in depth in the "Special Status Species" section.

### *Environmental Consequences Methodology*

Proposed management actions under each alternative are evaluated in terms of the context, intensity, and duration of the impacts, as defined below, and whether the impacts are considered beneficial or adverse to the natural environment. Generally, the methodology for natural resource impact assessment follows direction provided in the *Council of Environmental Quality Regulations for Implementing the National Environmental Protection Act*, section 1508.27.

This impact assessment considers the potential effects that implementation of the *Merced Wild and Scenic River Comprehensive Management Plan* could have on vegetation and wetland resources. Vegetation data in the project area derives from the Yosemite Parkwide Vegetation Map (1997) and other studies, including the *2010 Assessment of Meadows in the Merced River Corridor*, Yosemite National Park (Ballenger et al. 2011), the *Merced River and Riparian Vegetation Assessment* (Cardno/Entrix 2011), and the *Status of Rare Plants in the Merced River Corridor within Yosemite National Park* (Colwell and Taylor 2011). Wetland data in the project area derives from site-specific wetland delineations associated with past projects, and National Wetland Inventory data (USFWS 1995) supplemented with the Yosemite Parkwide Vegetation Map (1997) and other studies. Data on riparian habitats are taken from the *Merced River and Riparian Vegetation Assessment* (NPS 2011) for the Merced River corridor through Yosemite Valley. Data from the Yosemite Parkwide Vegetation Map (1997) are used to describe riparian habitats outside of Yosemite Valley. Quantitative analysis was used wherever possible; however, when quantitative analysis is not feasible, qualitative analysis is used. Qualitative analysis relies substantially on professional judgment, supported by extrapolation of relevant research, where appropriate, to reach reasonable conclusions as to the context, intensity, duration, and type of potential impact.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the river. This analysis further identifies whether there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the project area within Yosemite National Park. Regional impacts would be those that extend to the Sierra Nevada.
- **Intensity.** Three primary measures are used to evaluate the intensity of impacts on vegetation and wetlands: the size and type of resource, the integrity and condition of the resource, and the connectivity of the area to adjacent habitats. The greater the size of a resource, and the strength of its linkages with neighboring communities, the more valuable a resource becomes to the integrity and maintenance of biotic processes. These measures are used to describe both beneficial and adverse impacts.

The intensity of an impact on vegetation is a measure of perceptible changes in native plant community size, continuity, or integrity. Impact intensity is characterized as negligible, minor, moderate, or major. Negligible impacts are those that would have no measurable or perceptible changes in native plant community size, continuity, or integrity. Minor impacts would be measurable or perceptible, but would be localized within an isolated area, and the overall viability of the native plant community would not be affected. Moderate impacts would cause a measurable and perceptible change in the native plant community (e.g., size, continuity, or integrity); however, the impact would remain localized and could be reversed.

Major impacts would be substantial and highly noticeable and could be permanent in their effects on native plant community size, diversity, continuity, or integrity. Impacts on vegetation are quantified where possible by determining the acreage of vegetation communities altered. The amount of each vegetation community that would be directly affected is determined by a comparative analysis of vegetation spatial data representing existing conditions and conditions under proposed management actions. Other potential direct and indirect effects to vegetation communities, such as loss of integrity or vulnerability to invasion by nonnative species, are analyzed qualitatively.

- **Duration.** The duration of an impact is the time required for native plant communities to recover from the implementation of an alternative. The duration of impact is characterized as short-term or long-term. A short-term impact would have an immediate effect on the size, continuity, or integrity of native plant communities and is usually associated with transitional types of activities, such as facility construction. In general, short-term impacts on vegetation are those that would last up to 20 years following implementation of an alternative. Long-term impacts would lead to a loss in the size, continuity, or integrity of native plant communities. In general, long-term impacts would last longer than 20 years after implementation of an alternative.
- **Type of Impact.** Impacts are considered adverse if implementation of an alternative would reduce the size, continuity, or integrity of a native plant community. Impacts are considered beneficial if implementation of an alternative would increase the size, continuity, or integrity of a native plant community.

### *Environmental Consequences of Alternative 1 (No Action)*

#### **All River Segments**

The following discussion provides an overview of the types of impacts on vegetation and wetland resources that would occur in all segments of the Merced River corridor under Alternative 1 (No Action). The No Action Alternative would be a continuation of current conditions and management.

Wetlands are afforded special protection under Executive Order 11990 ("Protection of Wetlands") and NPS Director's Order 77-1 ("Wetland Protection"). The NPS must avoid direct or indirect adverse impacts on wetlands or, where impacts cannot be avoided, minimize loss or degradation by every practicable effort. The CWA and Rivers and Harbors Act, as regulated by the Corps and the U.S. Environmental Protection Agency, govern actions that may reduce or degrade wetlands. In general, these regulations and associated management actions would continue to maintain existing wetland conditions throughout Segments 1–8, and lead to no net loss of wetlands. Some local beneficial impacts would occur under current management practices that protect or enhance existing wetlands.

All riprap and abandoned infrastructure within the Merced River channel and meadow floodplains would remain, which may continue to alter the free-flowing condition of the river and constrain the river from naturally migrating and changing course. This infrastructure includes remnants of former sewer treatment facilities, sewer and water lines, man-holes, and former bridge abutments. Although some large wood would remain in place within the river channel, the NPS would continue to remove large wood where there are threats to human safety or infrastructure. This action would continue to

influence habitat characteristics within the channel, such as riffle/pool complexes, cover for aquatic species, and stability of riverbanks.

The NPS would continue to implement ecological restoration projects identified in the 2009 *Settlement Agreement* and projects that qualify as a Categorical Exclusion under NEPA. The NPS would also continue to control invasive species as prescribed in the *Invasive Plant Management Plan and Update* (NPS 2010, 2008), as well as removing encroaching conifers from some meadows. These actions would increase habitat integrity by decreasing the presence of invasive plants and enhancing habitat quality for terrestrial and aquatic wildlife. Current actions under the No Action Alternative to enhance biological values would result in long-term, minor, beneficial effects for vegetation and wetlands throughout the Merced River corridor.

The No Action Alternative would perpetuate the kinds and amounts of use that exist today. No new structures would be constructed in the river corridor with the exception of minor structures that are small; temporary; easily removed; not habitable; designed to support existing uses, systems, and programs; located within the existing building footprint; and not created solely for commercial purposes. Temporary housing structures for employees displaced by the 2008 rockfall would remain in place as needed. Housing for NPS employees and park partner staff would remain in current locations and at current levels.

Many resource impacts deriving from visitor and administrative use in Segments 1–8 would remain. Informal trails, bike paths, campsites, roads, bridle paths, parking, staging areas, and trails would remain in sensitive areas such as meadows and riparian habitat. Traffic congestion, lack of parking spaces, and improper parking adjacent to or encroaching on the edges of meadows would continue to affect meadow habitat. Adverse impacts would be mitigated through continuation of current policies, including visitor education with an emphasis on Leave-No-Trace practices in Wilderness, and restrictions on amounts and locations of overnight use. Current visitor use and facility management actions under the No Action Alternative would result in long-term, minor, adverse impacts on vegetation and wetlands throughout the Merced River corridor.

### **Segment 1: Merced River above Nevada Fall**

Continuation of current wilderness management policies, including protection of natural process, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use, would continue to protect vegetation and wetland resources in Wilderness segments of the Merced River corridor. In general, adverse impacts on vegetation and wetland resources in Segment 1 under the No Action Alternative would be local, long-term, and minor.

Vegetation and wetlands of the upper Merced River is generally intact, except where visitor use is intense (e.g., in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes).

Local, adverse impacts on native meadow plant communities associated with stock traffic would continue. Types of adverse effects associated with continued stock use include the spread of noxious

weeds, as well as grazing, trampling, compaction, and erosion. These effects would result in some localized losses in the natural structure, diversity, and productivity of meadow and riparian habitats. The Merced Lake—East Meadow would continue to exhibit very low vegetation cover and high bare ground levels associated with high levels of administrative stock use (Ballenger et al. 2011). Adverse impacts on meadow plant communities associated with stock use would be local, long-term, and minor within Segment 1.

The degree to which vegetation communities would be affected under the No Action Alternative depends on the position of the community relative to existing infrastructure and visitor use, as well as its sensitivity to perturbation. Chaparral and forest communities in proximity to Merced Lake High Sierra Camp and Merced Lake Backpackers Campground, Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, and major trail routes would experience site-specific, long-term, minor adverse effects. In other areas of the upper main stem of the Merced River, continued use of existing facilities (e.g., trails) at a similar level of intensity would have negligible effects on vegetation.

Ongoing visitor use in localized areas of Segment 1, including near the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, and Merced Lake High Sierra Camp and Merced Lake Backpackers Campground would continue to have an adverse effect on the integrity of some wet meadows in or adjacent to these areas. This includes local and minor adverse direct and indirect impacts on wet meadows and aquatic habitats from trampling, compaction, and erosion. Existing trails in some areas, such as the wet meadow complex surrounding Merced Lake, would also continue to adversely affect wetland and aquatic habitats through habitat fragmentation and by acting as barriers to localized plant and wildlife movements (barriers, in turn, affect seed sources, nutrients, and plant distribution patterns). Visitor use may create informal trails, which can fragment habitat, compact soil, and potentially disrupt hydrologic processes. Informal trails would remain in the wet meadow complex surrounding Merced Lake, Doc Moyle's Meadow, and Washburn Lake Meadow. Ongoing visitor use also would continue to contribute to the introduction or spread of noxious weeds. These ongoing and future adverse impacts would be long-term, and minor within localized areas of Segment 1.

## **Segment 2: Yosemite Valley**

Under the No Action Alternative, the size, structure, productivity, and continuity of vegetation and wetlands within Yosemite Valley (Segment 2) would continue to be affected by existing infrastructure and visitor use. General human-related effects in Segment 2 include trampling, unintentional introduction and spread of nonnative species (both plants and wildlife), litter, erosion, and compaction. Visitor use would continue to adversely affect vegetation and wetlands in areas of high use by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Modifications to the river channel and floodplain (through soil compaction, loss of riparian vegetation, and accelerated erosion) influence important stream characteristics that may combine to accelerate widening of the Merced River, which in turn would affect vegetation patterns over time. Trampling and visitor use would also continue to adversely affect understory vegetation, introduce and spread nonnative species, and impede natural regeneration of native oaks, woody shrubs, and riparian and meadow vegetation in localized high use areas. Development may limit the size or

fragment species populations locally. The east Valley is highly developed and development has resulted in disconnected vegetation communities. Under the No Action Alternative, these vegetation communities would remain in their fragmented state.

Meadow size would continue to gradually decrease in most meadows in Segment 2 due to conifer encroachment and existing alterations to natural meadow hydrology. Existing infrastructure, such as roads, channelized tributaries, bridges, ditches, structures, and campgrounds, would continue to alter meadow hydrology, or directly preclude establishment of meadow vegetation. Hydrological alterations would continue to influence meadow plant species composition as soil conditions trend toward drier conditions. Dry conditions would also sustain and encourage nonnative plant invasion, with a resulting loss of native diversity and productivity, as most non-native meadow species are currently found in drier areas. Ongoing meadow maintenance activities, including the removal of encroaching conifers, would offset some of these adverse impacts. Linear features, such as some roads and bridges, would continue to disconnect the main Merced River channel from the meadow floodplain during minor flood events, and impose unnatural barriers to water movement.

Informal meadow trails would largely remain under the No Action Alternative. Riparian habitat would continue to be protected at the current level. Localized riverbank erosion and scouring associated with bridges would remain. Denuded riverbanks in proximity to east Yosemite Valley campgrounds would remain, with the exception of riverbank restoration actions at North Pines Campground, which were approved in the 2009 *Settlement Agreement*. Conifer encroachment would be managed with fire reintroduction and direct removal of sapling trees at current management levels. Impacts on meadow and riparian habitats, including habitat fragmentation, reduced productivity of riparian and adjacent aquatic communities, and potential disruption of connectivity between terrestrial and aquatic habitats would continue.

Existing infrastructure, such as roads, bridges, ditches, structures, and campgrounds, would continue to indirectly affect upland vegetation patterns. For example, landscape irrigation would continue to affect native oaks. The development of linear features, such as roads and bridges, may act as unnatural barriers to plant colonization.

Existing infrastructure, such as roads, bridges, and ditches, that is near or adjacent to wetlands and riparian habitats would continue to adversely affect some of these features through alterations to the floodplain and localized hydrology. These hydrological alterations sometimes result in the conversion of wetland and riparian habitats to uplands, and ultimately result in a loss of wet meadow plant species and an increase in upland species, including conifer encroachment of wet meadow and riparian communities.

General visitor-related effects in high-use areas include trampling, litter, erosion, soil compaction, and the unintentional introduction and spread of nonnative plants and wildlife. Floodplain wetlands and the aquatic habitat of the Merced River would be adversely affected by these activities by further compacting soils, reducing vegetative cover, altering streambanks, and causing erosion. Ongoing activities that contribute toward the modification of the river channel and floodplain (through soil compaction, loss of riparian vegetation, the removal of large wood from the river channel, and accelerated erosion) influence important stream characteristics such as riffle/pool complexes,

substrate type, water quality, channel migration, and riparian and wet meadow cover. Some bridges would continue to cause hydrologic stress on upstream and downstream riparian areas. Along some stretches of the Merced River in eastern Yosemite Valley, riverbanks are largely denuded, affecting shading and nutrient dynamics in aquatic habitats. These effects may combine to accelerate bank erosion and widening of the Merced River (i.e., the channel could widen, flatten, and become shallower in reaction to the streambank destabilization caused by visitor use and trampling); increase water temperature; increase suspended sediment; reduce overbank flooding frequency; and reduce dissolved oxygen levels. Such changes to the physical characteristics of the river would be harmful to aquatic organisms, as well as riparian and wetland vegetation. These activities are focused in developed and high-use areas, particularly in east Yosemite Valley, and therefore tend to be localized. Overall, continued visitor-related effects on wetlands and riparian habitats would result in a local, long-term, moderate, adverse impact on wetland and riparian habitats within Segment 2.

### **Segments 3 and 4: Merced Gorge and El Portal**

Valley oak stands are considered a subset of the foothill woodland. Of particular concern along Segment 4 are the valley oaks, a regionally rare species, occurring in the El Portal area. Currently, vehicles park under the dripline of the valley oaks. This practice compacts soil under the trees, affecting root health, water uptake, and soil aeration. Existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. These adverse impacts on valley oaks in the El Portal area are considered local, long-term, and moderate.

Like other river segments, wetlands and riparian resources in Segments 3 and 4 would continue to be protected by existing regulations, policies, and management actions. Some wetlands and riparian habitats would continue to be adversely affected by existing infrastructure and visitor use. Wetlands and riparian habitats in Segments 3 and 4 tend to occur in narrow bands framing the Merced River, with several exceptions such as braided river channel at Cascades and west of the park boundary, and the El Portal pond. Visitor use within riparian areas of the Merced Gorge is minimal due to steep topography. The riparian zone would continue to be affected by infrastructure, including roads and pullouts, as well as trampling by visitors accessing the river. Roads, parking lots, and other impervious surfaces in or near the corridor would continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to the aquatic habitat of the Merced River. Impervious surfaces accumulate automobile-related pollutants, refuse, and other nonspecific pollutants that are easily transported to adjacent or nearby wetland resources through stormwater runoff. The riparian community through the Merced Gorge would continue to be affected by use of El Portal Road (and associated pollutants). Odger's Pond in El Portal is bisected by the Foresta Road and confined by Highway 140. The pond's natural hydrology is adversely affected by the proximity of these roads, though it does function as an overflow channel during extremely high floods. These adverse effects are considered local, long-term, and minor under the No Action Alternative for Segments 3 and 4. In general, adverse impacts on wetlands and aquatic resources in Segments 3 and 4 under the No Action Alternative are considered to be local, long-term, and minor.



### **Segments 5 and 8: South Fork Merced River Above and Below Wawona**

Adverse effects on vegetation communities located in the upper and lower South Fork Merced River are generally associated with visitor and stock use. No development, other than a few trails, currently occur in the upper and lower portions of the South Fork Merced River. Access is difficult, and visitor and stock use is low. Any increases in visitor use of the upper and lower reaches of the South Fork Merced River would negatively affect vegetation by increasing erosion, soil compaction, trampling, and refuse; decreasing water quality and vegetative cover; and through the potential introduction of nonnative species. However, the intensity of these effects would be negligible over time because topography and limited trail access would continue to limit the majority of visitors that could access these portions of the South Fork Merced river. Continuation of current Wilderness management policies, including protection of natural process, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use, would continue to protect vegetation and wetland resources in the Wilderness segments of the Merced River corridor. Overall, adverse impacts in this segment would be local, long-term, and negligible.

### **Segments 6 and 7: Wawona**

Although the upper portion of Wawona Meadow is large and generally intact, the lower meadow has been the site of repeated human intrusion since the turn of the century. The lower meadow continues to be affected by ditches, a golf course, a sprayfield for reclaimed water, and helicopter staging. Non-native plants including velvet grass, an aggressive invasive plant, dominate the golf course and provide a constant seed source for spread into the upper portions of Wawona Meadow. In addition, the continued use of the golf course precludes the area from potentially reverting to wet meadow habitat. These uses would remain and would continue to cause local, long-term, major, adverse effects on vegetation and wetlands in Wawona Meadow.

Visitor use would continue to affect additional wetlands and riparian habitat in Segment 7 by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. For example, the proximity of campsites in the Wawona Campground to the South Fork Merced River promotes trampling and riverbank erosion, inhibiting vegetation growth. Similarly, the picnic area along Wawona Road provides an undesignated river access point, which promotes riparian vegetation trampling and moderate erosion. Roads, parking lots, and other impervious surfaces in or near the Merced River corridor would continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to low-lying wetlands and the aquatic habitat of South Fork Merced River. Abandoned metal pipes in South Fork Merced River side channels dewater the floodplain terrace, affecting wetland hydrology. Ongoing impacts to habitat due to visitor use and existing infrastructure would result in local, long-term, minor, adverse effects on wetland and riparian habitats of the central South Fork Merced River and Wawona.

### **Summary of the No-action Alternative Impacts**

Existing development and human activity in the Merced River corridor affects vegetation patterns and wetland and riparian resources in localized areas. Implementation of the No Action Alternative would result in the continued impact on the size, structure, productivity, and continuity of habitats located

adjacent to or near existing infrastructure and areas that experience a high degree of visitor use. Existing infrastructure would also continue to alter ecosystem processes where they disrupt hydrology and act as barriers to species. Visitor use would continue to cause adverse effects, such as trampling, erosion, and compaction in localized areas. The combined effects of visitor use and existing infrastructure would in some cases lead to alterations in vegetation patterns (e.g., type conversion of wet meadow to conifer forest, or vegetated to non-vegetated) and modifications to the Merced River channel and floodplain (e.g., channel widening) in localized areas over the long-term.

Under the No Action Alternative, the NPS would continue to implement existing goals and policies under existing regulations (e.g., Executive Order 11990, Director's Order 77-1, CWA, Rivers and Harbors Act) and make incremental improvements to vegetation and wetland conditions on an ad-hoc basis, as opportunities and resource problems were presented. For example, constrained by existing developments and infrastructure, enhancement and reestablishment of wetlands would continue on a site-by-site basis instead of a parkwide or Valley-wide basis. Although substantial piecemeal improvements can take place under current direction, "reactive" resource management is not always effective at protecting sensitive resources over the long-term. Overall, effects could escalate as time passes and the effects on natural vegetative patterns worsened in some areas. These effects would be concentrated in areas of high visitor use such as Yosemite Valley, El Portal, and Wawona Meadow at the site of the Wawona Golf Course. Overall, long-term, moderate, adverse effects on vegetation and wetlands would continue under the No Action Alternative.

### **Cumulative Impacts of the No Action Alternative**

Cumulative effects to vegetation and wetlands are based on analysis of past, present, and reasonably foreseeable actions in the Sierra Nevada region in combination with potential effects of the No Action Alternative. The projects identified below include those projects that have potential to affect local vegetation and wetland patterns (i.e., within the Merced River corridor), as well as large-scale or regional patterns. The spatial scale of the cumulative analysis for the Vegetation section is the Sierra Nevada.

#### ***Past Actions***

Regional vegetation has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of nonnative species. Portions of the Merced River and South Fork Merced River corridors within Yosemite National Park are relatively unaltered by many of these past actions, especially in Wilderness areas where use has had little effect on vegetation. Development and use of infrastructure within Yosemite Valley and throughout the Sierra Nevada have caused long-term, adverse alterations to native vegetation patterns since European American occupation. Past restoration actions have reversed the adverse effects of some of these past actions, and have also contributed direct beneficial effects on vegetation communities.

Cumulative impacts on wetland resources are based on analysis of past, present, and reasonably foreseeable future actions in the Sierra Nevada in conjunction with the potential effects of Alternative 1 (No Action). Over half of the wetland area around the globe has been lost, and much of remaining wetland area is negatively impacted (Zedler and Kercher 2004). Wetlands are the most

altered and impaired habitat of the Sierra Nevada, and, as a small proportion of the landscape, are relatively rare (SNEP 1996). Dams, roads, and diversions in the Sierra Nevada have had a profound effect on streamflow patterns and wetlands. Broad valleys with wide riparian wetlands were often used as reservoir sites. Much of the flatwater on the western slope of the Sierra Nevada below 5,000 feet in elevation is artificial. These past actions have had long-term, adverse effects on regional wetland habitat.

Within Yosemite National Park past facility development (construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, agriculture, buildings, and campgrounds) and associated recreational use reduced extent and function of wetlands and other aquatic resources. Most loss of wetland area, such as wetland meadow expanse in Yosemite Valley, took place before the 1940s. However, most recent past projects have resulted in beneficial impacts on wetland and riparian habitats through restoration efforts and invasive plant species control, such as the Cook's Meadow Ecological Restoration Project.

Dams and diversions throughout most of the Sierra Nevada have profoundly altered stream-flow patterns and water temperatures. The removal of dam features can have beneficial impacts by restoring function to regional wetlands and riparian habitats. Past examples in Yosemite include the removal of Cascades Diversion Dam and Happy Isles Dam. Restoration and management projects may have site-specific and short-term, adverse effects (e.g., construction-related effects); however, the general goal of these projects is to increase coordinated resource management and to restore sensitive ecosystems. Therefore, these projects have a long-term, beneficial, cumulative impact on regional wetlands and riparian habitats.

Past projects and plans that contribute toward a cumulative effect on native plant and wetland communities include the following:

***Management and Restoration*** – South Fork and Merced Wild and Scenic River Implementation Plan, Cascades Diversion Dam Removal, Cook's Meadow Ecological Restoration, Fern Springs Restoration, Happy Isles Dam Removal, Happy Isles Fen Habitat Restoration Project, Happy Isles Gauging Station Bridge Removal, Merced River Ecological Restoration at Eagle Creek Project

### ***Present Actions***

Present development projects are not located within sensitive vegetation and wetland communities and incorporate measures to ensure the protection of any sensitive resources. Adverse impacts from present development actions are similar to those discussed for past actions. In general, the utility improvement projects include long-term improvements through the relocation of utilities outside sensitive areas, though construction of new utility lines under roads could influence subsurface drainage patterns. Current facility-related projects and plans that contribute toward a cumulative effect on native plant communities include the following:

***Facility Development*** – Crane Flat Utilities, East Yosemite Valley Utilities Improvement Plan/Environmental Assessment, Wauhoga Indian Cultural Center, Parkwide Communication Data Network, South Entrance Station Kiosk Replacement, Tioga Road Rehabilitation

Beneficial impacts for present management and restoration actions are similar to those discussed for past actions. Specific examples of present projects and plans with beneficial effects include the following:

***Management and Restoration*** – *Yosemite Vegetation Management Plan*, General Ecological Restoration, 2004 *Fire Management Plan/EIS*, Fuels reductions/forest rehabilitation projects (USFS), *Tuolumne Wild and Scenic River Comprehensive Management Plan*

#### ***Reasonably Foreseeable Future Actions***

Adverse impacts resulting from reasonably foreseeable development in the future are limited, as little is planned. Increasing numbers of visitors would perpetuate and potentially increase adverse impacts where wetlands vegetation communities are near areas currently used for recreation. Beneficial impacts for reasonably foreseeable future actions are similar to those discussed for past actions. Specific examples of reasonably foreseeable future projects include the following:

- Changing demographics of visitors in Yosemite
- Climate change
- Concessioner Parking Lot Restoration
- Restoration of the Mariposa Grove Ecosystem
- Yosemite Wilderness Stewardship Plan/EIS

#### ***Overall Cumulative Impacts***

Cumulative adverse effects would be related to increased development and access. Many of the aforementioned projects has the potential to have substantial site-specific adverse effects on vegetation resources during construction (short-term) and by direct displacement of resources (long-term). The larger effect of these actions is related to population and regional growth and their subsequent effect on natural resources, including native vegetation patterns. Examples of construction-related and human-use-related effects on vegetation patterns include direct displacement of vegetation (e.g., replaced with structures); introduction of nonnative species that invade adjacent natural areas and displace native species (e.g., spread by construction equipment and materials, vehicles, grazing animals, or backyard gardening); fragmentation of habitats, which decreases genetic diversity; alteration of natural patterns (e.g., fire suppression around structures, the introduction of night light); and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). In total, regional development and growth could have a net long-term, major, adverse effect on regional vegetation resources that would not be compensated by regional planning or restoration projects discussed above.

Wetland and riparian systems of the Merced River have been substantially altered by development and visitor activities. These changes have negatively influenced wetland size, form, and function and the plants, wildlife, and aquatic species that inhabit them. Restoration projects and management plans to help restore ecosystem function have lessened impacts in some areas, and have also resulted in beneficial effects. With increased visitor demand, it is anticipated that long-term, minor to major, cumulative, adverse impacts on wetlands would occur adjacent to areas where visitor use is concentrated. Existing facilities that encroach on historic wetlands limits the potential for ecosystem-

scale restoration projects. In addition, the intrusion of conifers in wet meadows would eventually reduce the size and overall amount of wetland habitats in Yosemite National Park. However, the quality of wetlands would improve as a result of individual restoration projects.

Past impacts on wetlands in the Sierra Nevada have been long-term, adverse, and major. Present and foreseeable future actions would contribute to reversing the major adverse impacts of past actions in Sierra Nevada, and would produce long-term, minor, beneficial effects on wetlands. For example, the Tuolumne Wild and Scenic River Comprehensive Management Plan is expected to produce long-term, beneficial effects on wetlands and riparian habitats in the region. These past, present, and future effects, in conjunction with the local, long-term, minor, adverse impacts of Alternative 1, would result in long-term, minor, adverse, impacts on wetlands.

### *Environmental Consequences of Actions Common to Alternatives 2–6*

As discussed in the “Environmental Consequences Methodology” section, ecological restoration activities may cause some local, short-term, minor, adverse impacts, but ultimately would result in beneficial impacts as natural ecological processes are restored. For example, construction activities associated with restoration management actions could have local, short-term, minor, adverse impacts on plant communities. Potential adverse impacts on vegetation include damage to or removal of vegetation, and the potential introduction and spread of invasive nonnative species. Vegetation that is removed would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor. These local, short-term, minor, adverse impacts from implementation of restoration management actions are not discussed further under each individual restoration action.

### **River Segments 1–8**

#### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** The following discussion provides an overview of the types of impacts to vegetation resources that would be common to all segments under all action alternatives. All action alternatives include programmatic restorative management actions that would occur across all segments of the Merced River Corridor. Program level actions include the removal of underground infrastructure, removal of riprap, and the management of large wood. In order to improve the hydrologic function and restore ecological integrity, the NPS would remove abandoned underground infrastructure throughout the corridor. This infrastructure currently contributes to dewatering of meadows and wetlands, and alteration of the natural hydrologic regime of the Merced River. Removal of these facilities would have a corridorwide, long-term, moderate, beneficial impact on meadow, riparian, and wetland habitats. The park would implement bioengineered riverbank stabilization techniques and selective large wood management as appropriate to support riverbank stabilization and improve aquatic habitat complexity. All areas from which infrastructure and riprap are removed would be returned to natural conditions, including revegetating with appropriate native plants. Removal of this infrastructure and riprap would result in a corridorwide, long-term, moderate, beneficial impact on riparian plant communities.

Program level actions include the protection of the riparian zone from new development within 150 feet of the ordinary high water mark and the removal of campsites from within 100 feet of the ordinary high-water mark. The NPS would undertake certain measures to address ongoing vegetation impacts, including those resulting from unauthorized river access points, informal trails, and conifer encroachment into meadow areas, through various restoration techniques, fencing and area closures, and visitor education and visual cues. Toward that end, the park would utilize brochures, maps, signage, and improved trail delineation techniques to direct visitors away from sensitive areas. These programmatic restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. Removing abandoned underground infrastructure, restoring informal trails, removing conifers from meadows, directing visitor use, removing riprap, and restoring free-flowing conditions along the Merced River corridor would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Thus, these management measures would have a corridorwide, long-term, moderate, beneficial impact on plant communities and wetlands along the corridor.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur across all segments under Alternatives 2-6 include removing 3,400 feet of riprap from the river bank and revegetating with riparian species, and replacing an additional 2,300 feet of riprap with bioengineered riverbank stabilization devices. Riprap placed along the banks of the Merced River inhibits the establishment of riparian vegetation. The removal of riprap and subsequent restoration of riparian habitat would result in a corridorwide, long-term, moderate, beneficial impact on native riparian plant communities.

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Ecological restoration actions that would occur within Segment 1 under actions common to Alternatives 2–6 include measures to reduce impacts on plant communities. Under Alternatives 2-6, trails in Segment 1 would be rerouted out of wetlands and sensitive communities. New trail routes would avoid wetlands and sensitive habitats. Under Alternatives 2-6, the park would relocate sections of trail through wetlands in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. The trail along wet sections of the Mist Trail would be hardened to avoid trail widening. Formal trails through meadows along the Triple Creek Fork cause extensive rutting and head cutting and would be rerouted to upland habitats, where possible. Informal trails in the Merced Lake Shore Meadow, adjacent to the Merced Lake High Sierra Camp, fragment meadow plant communities, stunt vegetation lining the lake shore, interrupt meadow hydrology, and compact soils. Under Alternatives 2-6, the park would decompact soils along informal trails at the Merced Lake Shore Meadow, fill ruts with native soils, and revegetate denuded areas with native plants. Merced Lake East Meadow near the Merced Lake Ranger Station has high levels of pack stock use, associated with lower vegetation cover and higher levels of bare ground. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 1.

## Segment 2: Yosemite Valley

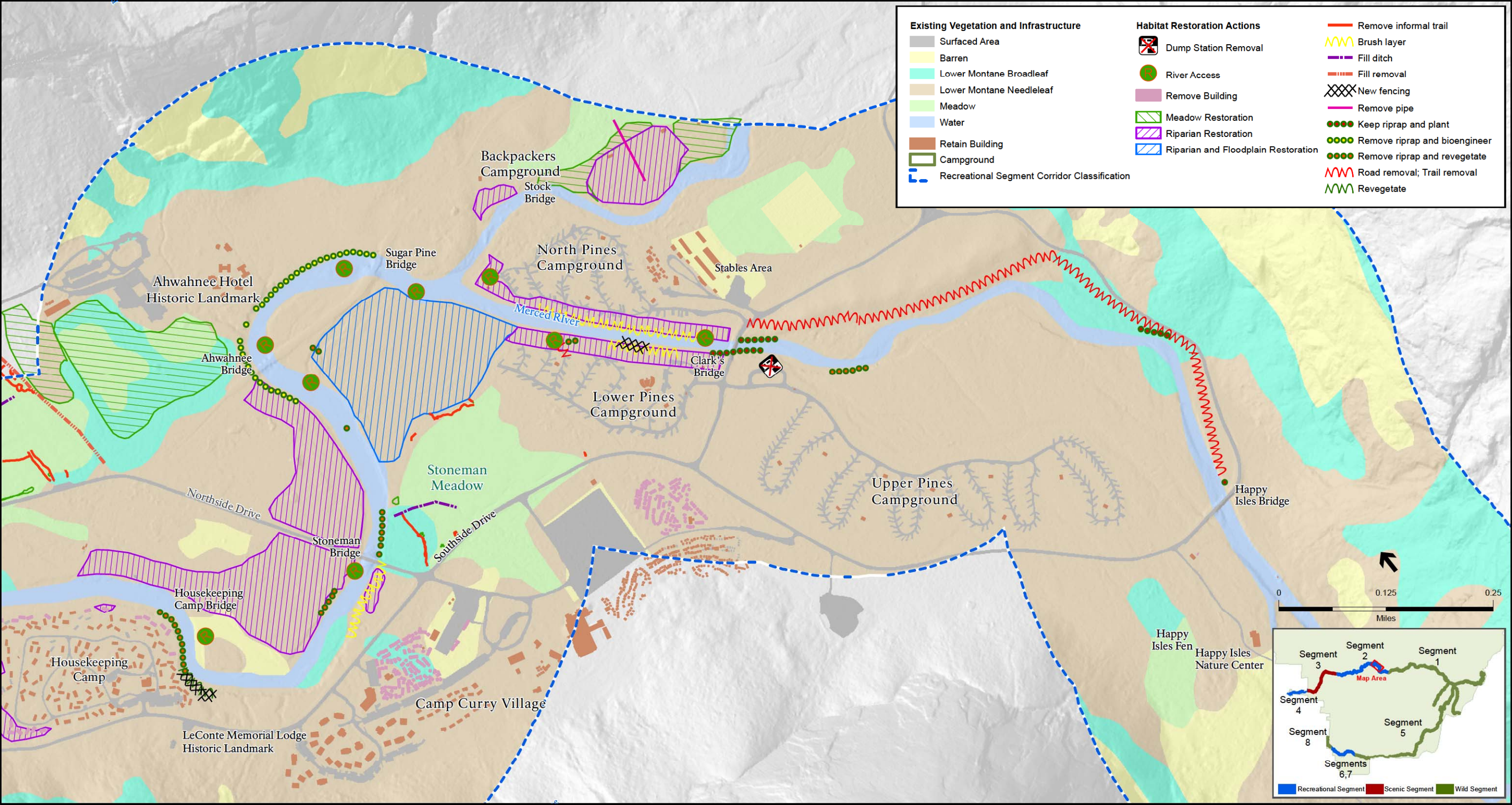
### *Impacts of Actions to Protect and Enhance River Values*

Actions to protect and enhance river values that would occur in Yosemite Valley under Alternatives 2-6 involve removal of abandoned infrastructure and other development affecting the Merced River's hydrologic function, extensive meadow restoration, and management of high visitor-use areas to address associated impacts on riparian habitats. The park would also restore six miles of informal trails in Yosemite Valley meadows. Removal of abandoned or obsolete infrastructures would reduce ongoing impacts on meadow hydrology and lessen channel scour. Upland restoration activities, including removal of informal trails, roadbeds, and parking areas, would improve meadow health. Habitat restoration actions in Segment 2 common to Alternatives 2-6 are displayed in **figures 9-13 through 9-16**. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-6 and 9-7**. A total of 151 acres of vegetation would be enhanced or restored in Segment 2, including 35.84 acres of wetlands. Meadow restoration would include actions to improve hydrologic function, restore native vegetation, and remove inappropriate uses or facilities. Meadow habitat integrity, extent, and hydrological connectivity to the river would be enhanced through construction of wide box culverts (or other design components such as rolling dips, permeable subgrade, etc.), formalizing or removing shoulder parking, restoring natural topography, removing ditches and abandoned infrastructure, and improving roadways and trails. In addition, the NPS would decompact soils and revegetate denuded meadow and riparian habitat. Specific management actions would include filling ditches, removing encroaching conifers, relocating and/or elevating trails onto boardwalks, revegetation with willows and other native species, removing abandoned infrastructure, removal and restoration of informal trails and parking areas, decompacting soils, and improving road crossings in meadows. Overall these measures would improve the hydrologic function and restore the ecological integrity of Yosemite Valley meadows.

Programmatic actions also include improving the condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.

Programmatic restorative management actions to improve the free-flowing condition of the river that would occur within Segment 2 under all action alternatives include in channel improvements, such as strategically placing large wood (log jams) to lessen the scouring from bridge structures. In the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would enhance channel complexity. Water quality would be improved by relocating the Upper Pines Dump Station. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats.

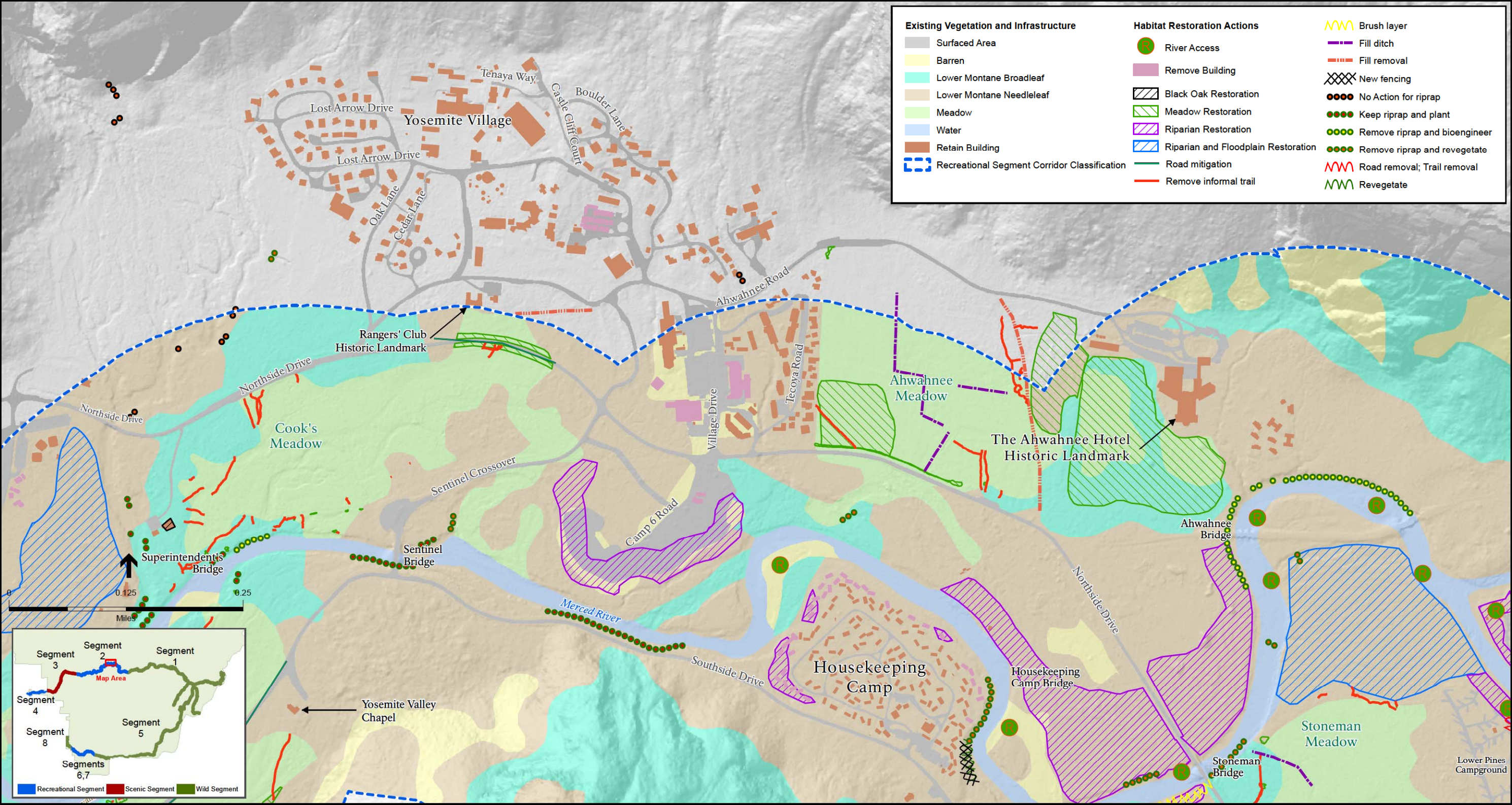




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-13**  
Curry Village Area: Common to Alternatives 2-6 Habitat Restoration Actions

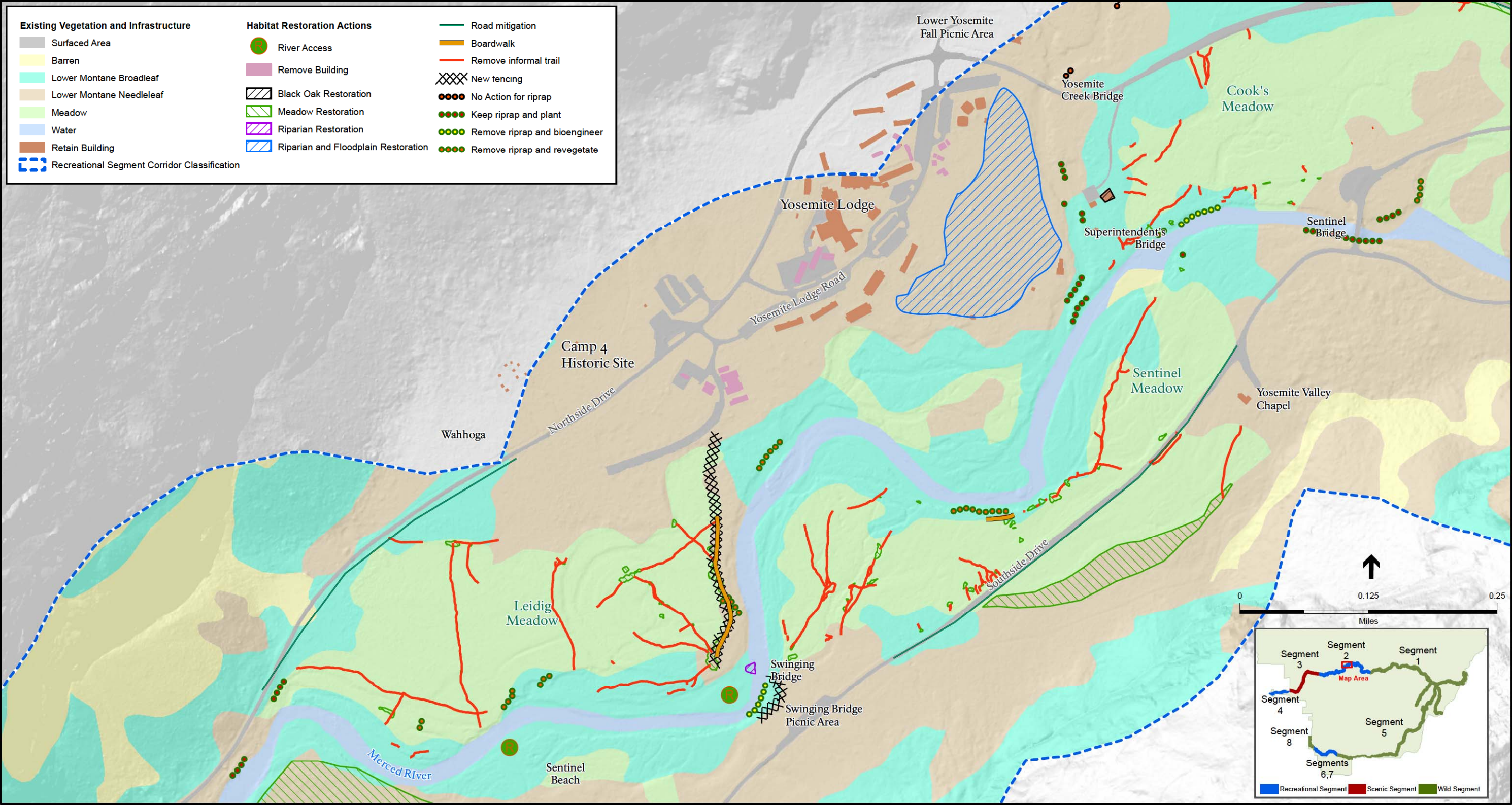




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-14**  
Yosemite Village Area: Common to Alternatives 2-6 Habitat Restoration Actions

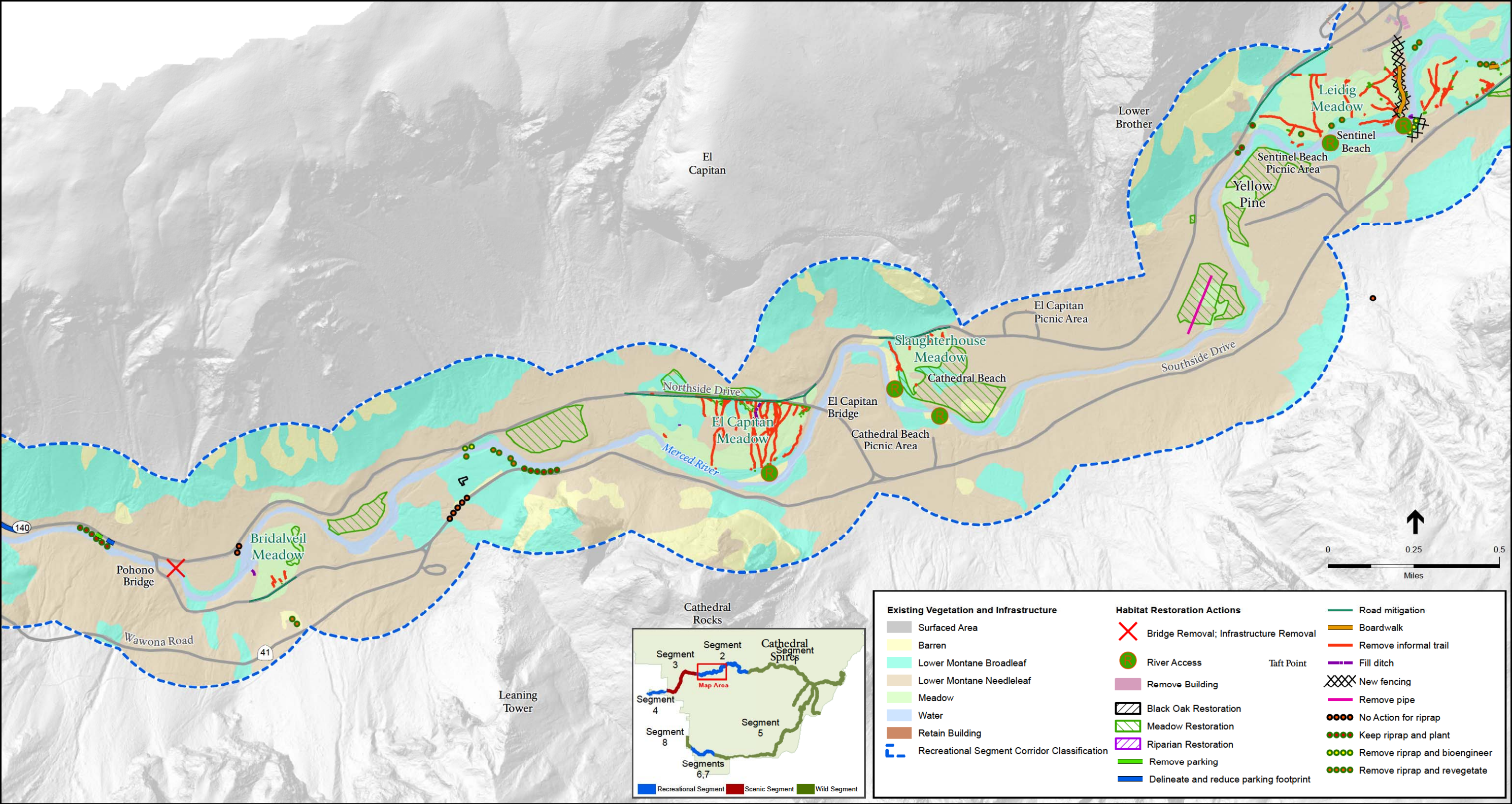




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-15**  
Yosemite Lodge Area: Common to Alternatives 2-6 Habitat Restoration Actions





SOURCE: NPS, 1997, 2011, 2012

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-16**  
West Yosemite Valley: Common to Alternatives 2-6 Habitat Restoration Actions

**TABLE 9-6: SEGMENT 2 VEGETATION RESTORATION COMMON TO ALTERNATIVES 2-6<sup>a</sup>**

Current Vegetation type	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Intermittently to seasonally flooded meadow	13	Meadow	16	Meadow	18
Semi-permanently to permanently flooded meadow	3				
Sparsely vegetated undifferentiated	2	Sparsely vegetated	2		
California black oak forest alliance	6	Black oak woodland	14	Black oak woodland	14
California black oak /(bracken fern) forest mapping unit	8				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1	Coniferous forest	58	A mosaic of meadow, black oak, and open canopy coniferous forest	58
Ponderosa pine-incense cedar forest alliance	18				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	39				
Ponderosa pine-incense cedar forest alliance	8	Coniferous forest	25	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	25
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	17				
Urban/developed	4	Development	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	36
Ponderosa pine-incense cedar forest alliance	20	Coniferous forest	32		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	12				
Total	151		151		151

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**TABLE 9-7: SEGMENT 2 WETLAND RESTORATION COMMON TO ALTERNATIVES 2-6**

Wetland Type	Acres
<b>Segment 2</b>	
Palustrine Emergent	16.15
Palustrine Forested	18.85
Palustrine Scrub Shrub	0.84
<b>Total amount of wetlands restored</b>	<b>35.84</b>
SOURCE: NPS 2012c	



High visitor use along sensitive riverbanks in Yosemite Valley is causing vegetation trampling and soil compaction, resulting in riparian vegetation loss, riverbank erosion, and decreased soil infiltration. In some areas, trees are undercut as a result of trampling around the base of the tree, leading to potential channel widening. Under Alternatives 2-6, visitors accessing the river would be redirected to resilient sandbar points and sandy beaches through signage, campground maps, and brochures. Specific river access points would be designated. Parking would be relocated to more suitable areas. Picnic areas would be delineated by fencing and river terraces would be revegetated with native riparian species. Vulnerable steep slopes and riparian habitats would be fenced off to prevent further bank erosion. Some infrastructure (toilets, parking, and picnic tables) within the 10-year floodplain would be removed. The proposed redirection of visitor uses to resilient areas away from unstable slopes and sensitive locations along riverbanks, and the associated restoration of eroded and denuded areas, would generally have a beneficial effect on riparian plant communities.

These restoration management actions would improve hydrologic function and restore ecological integrity of the river corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the Merced River corridor. Removing abandoned underground infrastructure, restoring informal trails, directing visitor use, and restoring free-flowing conditions along the river corridor would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

#### **Biological Resource Actions.**

**Ahwahnee Meadow:** Actions common to Alternatives 2-6 to protect and enhance river values at the Ahwahnee Meadow include restoring an impacted portion of the Ahwahnee Meadow to natural meadow conditions and removing the tennis courts from black oak woodland. Disjunct portions of Ahwahnee Meadow would be reconnected by selectively removing conifers to restore approximately 5.65 acres of meadow habitat. Enhancing meadow connectivity would reduce meadow fragmentation and removal of the tennis courts from black oak woodland would allow for woodland habitat to be restored. Natural meadow topography would be restored by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow species. Actions to restore Ahwahnee Meadow would have local, long-term, moderate, and beneficial impacts on vegetation and wetlands due to an increased amount of meadow and oak woodland habitat, a reduction in habitat fragmentation, and enhanced habitat function (restored topography and hydrological connectivity).

**Yosemite Valley Campgrounds:** Common to Alternatives 2-6, the NPS would remove all campsites within 100 feet of the bed and banks of the Merced River in all Valley campgrounds and restore riparian habitat through the removal of asphalt parking spaces, base rock, and fill material. Soils would be decompacted and topography would be recontoured to natural conditions. Native riparian plant species would be planted to revegetate denuded areas. Riparian habitat protection would be achieved through redirecting visitors to more stable and resilient areas, and installation of new fencing (or adjusting existing fencing) to protect newly restored riparian zones. Restoration of the 100 foot buffer of floodplain and riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, and beneficial impacts to riparian plant communities.

***El Capitan Meadow:*** Common to Alternatives 2-6, the NPS would reroute the climber use trail on the north side of the road to an appropriate route (a few meters to the east). Additionally, informal trails through meadow and oak woodland habitat would be removed and fencing or natural barriers and signs would be installed to keep visitors from trampling sensitive meadow vegetation. Existing culverts would be replaced and additional culverts would be installed to improve water flow underneath El Capitan Straight on Northside Drive. Encroaching conifer saplings would be removed from El Capitan Meadow. Restoration of El Capitan Meadow would result in local, long-term, minor, and beneficial impacts on meadow plant communities from reduction in trampling from foot traffic, increased hydrological connectivity, and reduced conifer encroachment into meadow habitat.

Additional actions common to Alternatives 2-6 in Yosemite Valley include: formalizing parking and river access from the Pohono Bridge to the Diversion Dam; adding 150 feet of boardwalk to the west of the existing boardwalk at Sentinel Meadow; expanding fenced areas to protect wetlands on the north end of Stoneman Meadow near Lower Pines Campground; restoring 20 acres of floodplains at the western portion of former Lower Pines Campground; removal of infrastructure and restoration of an additional 30 acres at the Former Upper and Lower Pines campgrounds; removing roadside parking along Sentinel Drive and restoring to natural conditions; relocating parking from Devil's Elbow to the east of the current parking lot and delineating a formal trail to access the sandbar; focusing visitor use and river access at Housekeeping Camp to two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge; designating formal river access at Cathedral Beach Picnic Area and restoring riparian habitat; and filling approximately 2,155 feet of ditches throughout Valley meadows that are currently not serving current operational needs.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Thus, these management measures would have a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternatives 2-6 include: removing the abandoned gauging station at Pohono Bridge, removing the footings and former river gauge base at Happy Isles, and restoring these areas to natural conditions. In addition, constructed log jams would be constructed in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segment. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats, resulting in segmentwide, long-term, moderate, beneficial impact on riparian plant communities and wetlands.

**Cultural Resource Actions.** Specific actions to enhance cultural resources in Segment 2 and common to Alternatives 2-6 include removing campsite 208 and bear box from the East Valley Campground. Additionally, bathroom foot traffic at this campground would be rerouted away from the milling



feature and the feature would be protected by fencing. The removal of campsite 208 and rerouting of foot traffic would have long-term, local, negligible, and beneficial impacts on vegetation.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values that would occur within Segment 2 under Alternatives 2-6 include: selectively thinning conifers and other vegetation in the vicinities of The Ahwahnee and Meadow, Bridal Veil Falls and West Valley, Cooks and Sentinel Meadows, Curry Village, El Capitan, Housekeeping Camp, Yosemite Lodge, and other areas of the Valley; restoring grassland and oak habitat in the areas of Bridalveil Straight; repairing riverbank erosion at Clark's Bridge; and addressing informal trails and trampling at the east end of El Capitan Meadow. The trees proposed for removal under these actions is summarized in **table 9-8**. The estimated number of trees that would be removed is organized by species and size (NPS 2012b). Trees less than 6 inches diameter at breast height (DBH) can be removed in order to maintain a vista without additional compliance, and are not included in the estimates. A complete description of these scenic vista actions can be found in Appendix H.

**TABLE 9-8: MAXIMUM NUMBER OF TREES REMOVED UNDER ALTERNATIVES 2–6 IN SEGMENT 2**

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Black Oak	1	1	5	0	0	0	0	<b>7</b>
Cedar	794	476	234	147	36	2	1	<b>1,690</b>
Douglas Fir	1	6	1	0	3	0	0	<b>11</b>
Dogwood	1	0	0	0	0	0	0	<b>1</b>
White Fir	49	33	34	15	5	1	0	<b>137</b>
Live Oak	7	3	0	0	0	0	0	<b>10</b>
Ponderosa	355	277	443	386	94	9	3	<b>1,567</b>
<b>Total</b>	<b>1,208</b>	<b>796</b>	<b>717</b>	<b>548</b>	<b>138</b>	<b>12</b>	<b>4</b>	<b>3,423</b>
SOURCE: NPS 2012b								

Trees that are removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley. Adherence to proposed mitigation measures MM-GEO-1, MM-VEG-2, and MM-VEG-3, as applicable (see Appendix C) would reduce impacts to vegetation communities to segmentwide, long-term, minor, and adverse.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Actions to manage visitor use and facilities within Segment 2 that would occur under actions common to Alternatives 2-6 involve changes to campsites, visitor and administrative facilities, employee housing, and transportation. Under each action alternative, the NPS would remove or repurpose several visitor facilities, including the Curry Village Ice Rink; Happy Isles Snack Stand; Yosemite Village Store; Yosemite Lodge Post Office, Yosemite Lodge Pool, and Snack Stand; and Bank Building. The NPS would also construct new campsites in upland areas, and remove campsites from the rockfall

hazard zone. Concessioner employee housing within Yosemite Valley would be affected through the removal of temporary units at the Yosemite Lodge, Highland Court, Huff House, and Boys Town. New housing would be constructed at Huff House (164 beds). Each action alternative includes actions to improve pedestrian wayfinding and access. The park would also undertake a number of transportation and parking management measures; remediation, redesign, and expansion of existing parking areas; and construction of new parking lots in other areas. Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities common to Alternatives 2-6. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in Yosemite Valley.

**Camp 6 & Yosemite Village.** Actions in the Camp 6 and Yosemite Village areas that are common to Alternatives 2-6 include the relocation of visitor vehicle services and concessioner general office functions to other buildings and the removal of the existing garage structure and concessioner general office; and transportation actions that formalize parking and public movement in the Camp 6 and Village Sport Shop area. Relocation of services and operations to other buildings would have no effect upon vegetation and wetlands. Construction activities at Camp 6 and Yosemite Village would result in direct, temporary and permanent losses of native vegetation as well as redevelopment of existing developed areas. The potential effects of these actions are described in greater under each action alternative.

Outside of previously developed areas, impacts from these actions occur entirely in lower montane broadleaf forest and lower montane coniferous forest; these vegetation types are among the most dominant communities in Segment 2. Losses to these vegetation communities would occur through vegetation clearing, grading, development, or other surface disturbance (e.g., driving over vegetation). In addition, potentially affected vegetation at Camp 6 and Yosemite Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Direct impacts to vegetation, including trampling or removal of rooted vegetation, would cause a reduction of total numbers of plants and/or a reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts could also include decrease plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

Vegetation that would be removed at Yosemite Village under actions common to Alternatives 2-6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as

applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

As part of these actions, informal parking along Sentinel Drive and several structures in the floodplain would also be removed. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, these restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. This action would result in a localized, long-term, minor, beneficial impact to vegetation in Segment 2.

**Yosemite Lodge & Camp 4.** Actions in the Yosemite Lodge and Camp 4 areas that are common to Alternatives 2-6 include the removal of temporary employee housing and the reconstruction of new housing. Under all alternatives, the NPS Volunteer Office (former Wellness Center), post office, swimming pool, and snack stand would all be removed, and the convenience shop and nature shop would be re-purposed. Construction and removal activities at Yosemite Lodge & Camp 4 would result in direct temporary and permanent losses of vegetation as well as redevelopment of existing developed areas. These losses would occur through vegetation clearing, grading, or other surface disturbance (e.g., driving over vegetation) and would occur entirely in lower montane coniferous forest. This is a dominant native vegetation community in Segment 2. In addition, vegetation communities at Yosemite Lodge & Camp 4 experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction.

For the same reasons discussed above for the Camp 6 and Yosemite Village area, actions that are common to Alternatives 2-6 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to vegetation in Segment 2.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

To protect and enhance river values within the Merced Gorge and El Portal, the NPS would remove informal trails, nonessential roads, fill materials, and abandoned infrastructure throughout Segments 3 and 4. The Odger's fuel storage facility would be removed and the area restored. The NPS would also develop best management practices for revetment construction and repair throughout the Merced River corridor. Valley oaks would be protected in El Portal through mitigation measures related to overwatering, tree pruning, and protecting the ground surface within the dripline of oaks (MM-GEO-1 and MM-VEG-2, as applicable; see Appendix C). Informal trails and a nonessential road would be removed from two locations in El Portal. The types of habitat that would be affected by these restoration actions in Segment 4, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-9 and 9-10**. A total of 12 acres of vegetation would be restored or enhanced in Segment 4, including 0.05 acres of wetlands.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 4 and associated plant communities and wetlands. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 4.

**TABLE 9-9: SEGMENT 4 VEGETATION RESTORATION COMMON TO ALTERNATIVES 2-6<sup>a</sup>**

Current Vegetation type	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Valley oak woodland alliance	1	Foothill broadleaf woodland	1	Valley oak woodland	1
canyon live oak-(Ponderosa pine-incense cedar) forest superassociation	11	Lower montane needleleaf	11	Riparian & floodplain	11
<b>Total</b>	<b>12</b>		<b>12</b>		<b>12</b>
<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance					

**TABLE 9-10: SEGMENT 4 WETLAND RESTORATION COMMON TO ALTERNATIVES 2-6**

Wetland Type	Acres
<b>Segment 2</b>	
Palustrine Emergent	0.001
Palustrine Forested	0.05
<b>Total amount of wetlands restored</b>	<b>0.05</b>
SOURCE: NPS 2012c	

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 4 under Alternatives 2-6 include removing development, asphalt and imported fill from the Abbieville and Trailer Village areas. The areas would be recontoured and planted with native riparian species and oaks within the 150 foot riparian buffer. The Greenemeyer Sandpit contains fill material that precludes natural flooding and regeneration of riparian plant communities. Under Alternatives 2-6 the Greenemeyer Sandpit would be restored to natural conditions. Fill material would be removed and the topography recontoured. Native riparian vegetation would be planted to restore the natural vegetation for the site. Off-street roadside parking areas between Foresta Road and the Merced River will be formalized. These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 4 and associated plant communities and wetlands. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 4.

**Scenic Resource Actions.** Specific projects to protect and enhance the river’s scenic values that would occur within Segment 3 under Alternatives 2-6 include selectively thinning conifers in the area of the Cascade Falls viewpoint. Trees proposed to be removed are summarized in **table 9-11**. The estimated number of trees that would be removed is organized by species and size (NPS 2012b). Trees less than 6 inches diameter at breast height (DBH) can be removed in order to maintain a vista without additional compliance, and are not included in the estimates. A complete description of these scenic vista actions can be found in Appendix H.

**TABLE 9-11: MAXIMUM NUMBER OF TREES REMOVED COMMON TO ALTERNATIVES 2–6 IN SEGMENT 3**

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Cedar	6	0	0	1	0	0	0	<b>7</b>
Live Oak	0	1	0	0	0	0	0	<b>1</b>
Ponderosa	1	1	1	0	0	0	0	<b>3</b>
Red Fir	3	0	0	0	0	0	0	<b>3</b>
<b>Total</b>	<b>10</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>
SOURCE: NPS 2012b								

Trees that are removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley. Adherence to proposed mitigation measures MM-GEO-1, MM-VEG-2, and MM-VEG-3, as applicable (see Appendix C), would reduce impacts to segmentwide, long-term, minor, and adverse.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under all the action alternatives, the Park would construct infill housing in El Portal Village Center. All housing redevelopment in this area will be outside the 100-year floodplain. All other redevelopment will be outside the 150-foot riparian buffer. Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at El Portal, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in El Portal.

#### **Segments 5, 6, 7, and 8: South Fork Merced River**

##### *Impacts of Actions to Protect and Enhance River Values*

Actions to protect and enhance river values that would occur within segments 6 and 7 under Alternatives 2–6 include measures to maintain river flows, manage campground waste, and protect cultural resources. The park would improve Wawona Campground wastewater and refuse management and facilities, remove abandoned infrastructure, and undertake numerous site-specific management measures to counteract or minimize ongoing impacts on cultural resources.

There are abandoned metal pipes in side channels on the South Fork Merced River that dewater the terrace. This infrastructure affects the natural hydrologic regime of the river. Under Alternatives 2–6,

abandoned metal pipes would be removed. The South Fork Merced River Wawona picnic area, Wawona Store picnic area, and Wawona Swinging Bridge receive high levels of use. There are no formal river access points at these sites, and visitors access the river by creating informal trails, causing loss of riparian vegetation and riverbank erosion. Under Alternatives 2-6, formal access points to the river would be established. This would help reduce impacts on riparian habitat and erosion. The types of habitat that would be affected by these restoration actions in Segment 7, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-12**. A total of three acres of vegetation would be restored in Segment 7.

**TABLE 9-12: SEGMENT 7 VEGETATION RESTORATION COMMON TO ALTERNATIVES 2-6<sup>a</sup>**

Current Vegetation type	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Ponderosa pine woodland alliance	1	Coniferous forest	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Ponderosa pine-incense cedar forest alliance	2				
<b>Total</b>	<b>3</b>		<b>3</b>		<b>3</b>
<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.					

These restoration management actions would improve hydrologic function and restore ecological integrity of the river corridor in Segment 7 and associated plant communities and wetlands. Overall, these actions would result in a segmentwide, long-term, minor, beneficial impact on plant communities and wetlands in Segment 7.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic values that would occur within Segment 6 under Alternatives 2-6 include implementation of the water conservation plan related to the minimum flow analysis for the South Fork Merced River. Although the NPS would retain current water collection and distribution system associated with the Wawona Impoundment, implementation of this action would reduce water withdrawal rates and improve the free-flowing condition of the South Fork Merced River by implementing the water conservation plan related to the minimum flow analysis for the South Fork Merced River. This management action would improve hydrologic function and restore ecological integrity of the river corridor in Segment 6 and associated plant communities and wetlands. Overall, this action would result in a segmentwide, long-term, minor, beneficial impact on plant communities and wetlands in Segment 6.

**Cultural Resource Actions.** Specific projects to protect and enhance the river's cultural values that would occur within Segment 7 under Alternatives 2-6 include removing 7 campsites from Wawona Campground that cause potential impacts to sensitive archeological resources. Overall, this action would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 6.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions to manage visitor use and facilities within Segments 6 and 7 that would occur under Alternatives 2–6 involve construction of and improvements to administrative and visitor-serving facilities. Under Alternatives 2–6, the park would improve river access, restroom, picnic, and bus stops within Wawona.

Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at Wawona, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in Wawona.

The Wawona Maintenance yard currently extends to the riverbank and affects riparian habitat by soil compaction, storage of nonnative fill material, and storage of vehicles and other supplies. To reduce riparian impacts and restore the area, the NPS would remove staged materials, abandoned utilities, vehicles, and the parking lot from the riparian buffer and restore the area to natural conditions. NPS would also remove roadside parking between the Wawona Store and Chilnualna Falls Road. These restoration management actions would improve hydrologic function and restore ecological integrity of the South Fork Merced River corridor in Wawona and associated plant communities and wetlands. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

Wawona. The only project-level action in the Wawona area that is common to Alternatives 2–6 involves the redesign of a bus stop to accommodate visitor use. This action would have local, long-term, negligible, adverse impacts on vegetation and wetlands.

**Summary of Impacts Common to Alternatives 2–6**

Alternatives 2–6 would restore approximately 166 acres of vegetation, including 35.89 acres of wetlands. Under all action alternatives, the NPS would address some existing adverse impacts on vegetation communities (mainly meadows, wetlands, and riparian habitats) and implement restorative management actions to improve and restore hydrologic function and restore ecological integrity throughout the Merced River corridor, remove and restore informal trails, direct the public onto established trails and river access points, restore native plant communities, protect sensitive habitat areas, and minimize risk of impacts on new and existing structures associated with flooding. Relocating facilities out of meadow and riparian areas; restoring informal trails; controlling river access; eliminating informal parking; and delineating formal parking areas, trailheads, and trails would be part of a comprehensive strategy to reduce existing adverse impacts on meadow, wetland, and riparian vegetation. Existing natural resource management actions, such as removal of nonnative invasive plants, would continue.

In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the Merced River and South Fork Merced River, enhance habitat complexity in riparian and aquatic



zones, reduce human and pack-related disturbances, and reduce nonnative species and conifer intrusion into sensitive habitat. Adverse effects from these actions would be local, short-term, and minor or negligible. The long-term effect would be segmentwide, moderate, beneficial impacts on vegetation communities within the Merced River corridor. These effects would be most prominent in areas of high human use, such as Yosemite Valley and Wawona (Segments 2 and 7).

### ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **Segment 1: Merced River above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Merced Lake East Meadow near the Merced Lake Ranger Station has high levels of pack stock use, which contributes to lower vegetation cover and higher levels of bare ground. Under Alternatives 2, grazing would be permanently removed from the Merced Lake East Meadow. The park would require administrative pack stock passing through the Merced Lake area to rely on pellet feed that is packed into the site instead of allowing pack stock to graze in the meadow. This would help protect meadow vegetation from high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits. These actions would have local, minor beneficial impacts to vegetation over the long term.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect vegetation and wetlands in Segment 1. Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 25), closing of the Merced Lake High Sierra Camp, and wilderness campground modifications. Under Alternative 2, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed, resulting in approximately 11 acres of restored meadow and subalpine habitat. The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result from the elimination of designated camping at Moraine Dome and conversion of the Little Yosemite Valley Backpackers Campground to dispersed camping. Dispersed camping at the Merced Lake Backpackers Campground would be increased, but facilities would be reduced. Areas either closed or converted to dispersed camping would be restored to natural conditions, including restoration of native vegetation communities.

These management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 1 and associated plant communities and wetlands. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 2 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and the expansion of dispersed camping at Merced Lake Backpackers

Camping Area into the High Sierra Camp footprint. These actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1 by reducing impacts on vegetation communities related to concentrated human use.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 would have local, long-term, minor, beneficial impacts on plant communities and wetlands along the corridor.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Ecological management actions that would occur within Segment 2 under Alternative 2 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; rerouting and re-vegetating the Valley Loop Trail through Slaughterhouse Meadow out of wetlands and meadows to an upland area; moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow; removing several buildings at Yosemite Lodge out of the 100-year floodplain and restoring the area.

Habitat restoration actions in Segment 2 under Alternative 2 are displayed in **figures 9-17 through 9-20**. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-13 and 9-14**. A total of 271 acres of vegetation would be restored in Segment 2, including 47.92 acres of wetlands (this includes restoration actions common to Alternatives 2-6).

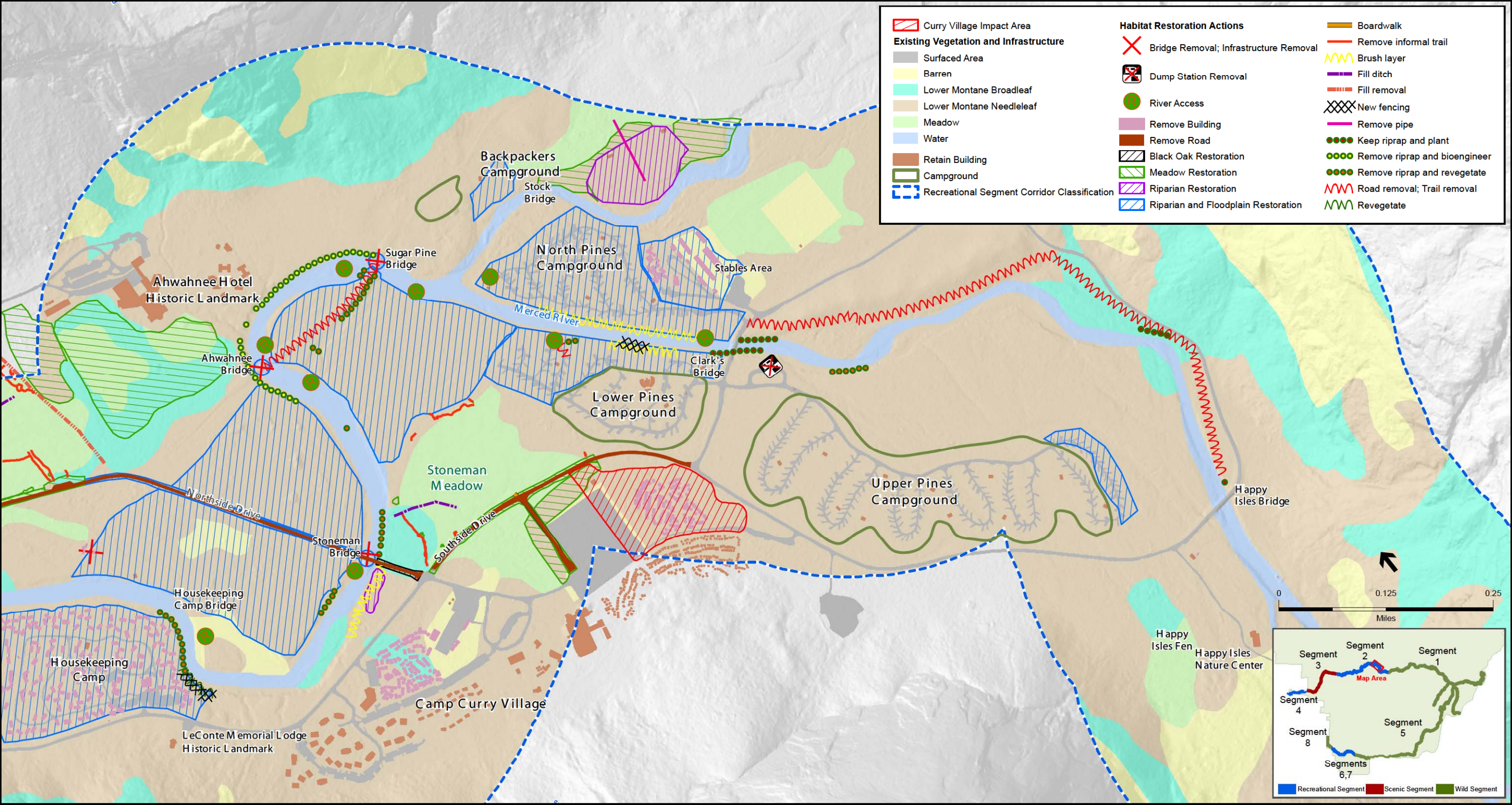
Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the 2–10 year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

### **Biological Resource Actions.**

**Yosemite Valley Campgrounds:** Under Alternative 2, specific restoration actions to enhance the river's biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 25.1 acres of floodplain/riparian habitat, and removing all informal trails and reducing roadside parking at El Capitan Meadow. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, and beneficial impacts to vegetation.

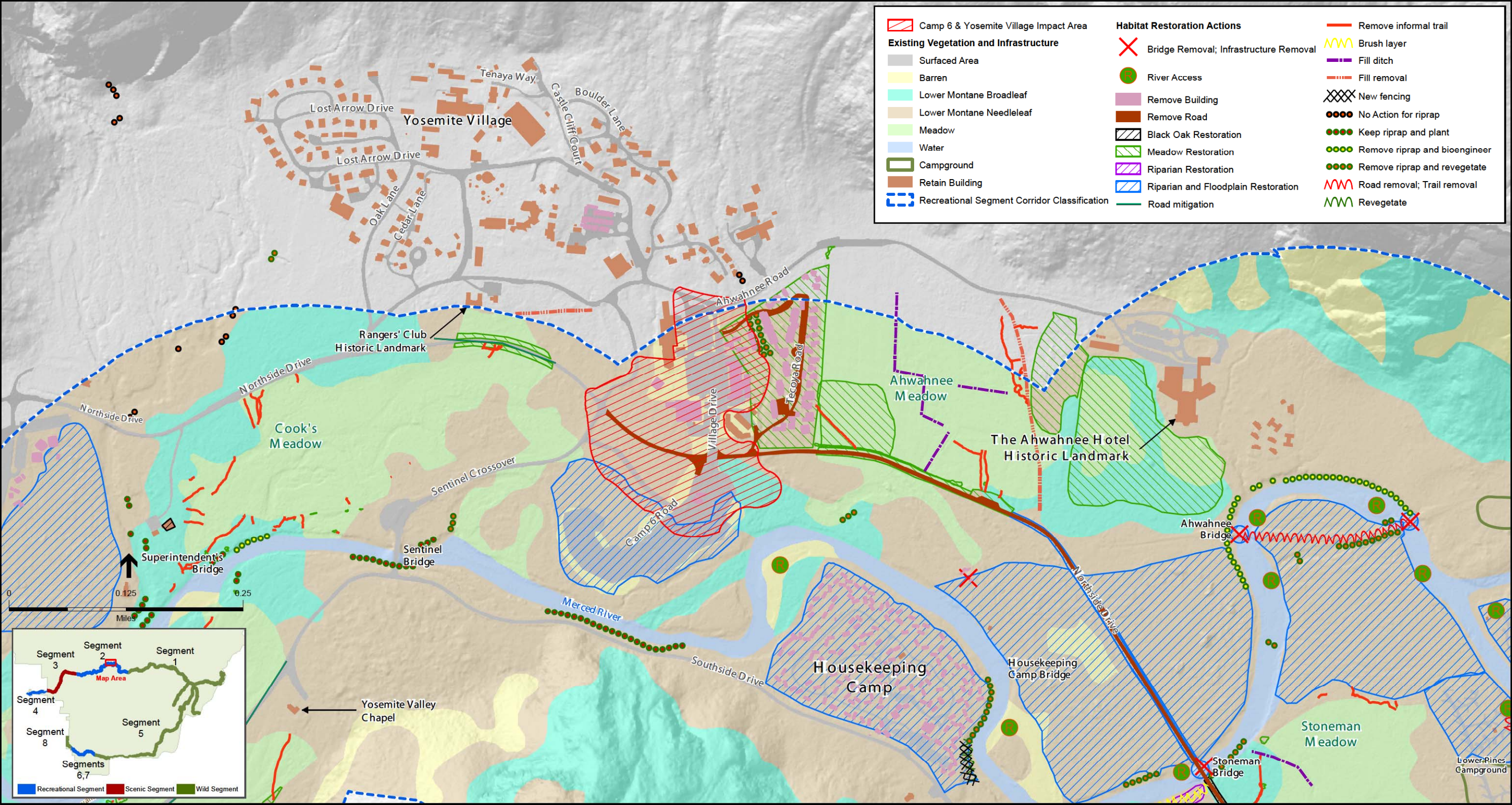




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-17**  
Curry Village Area: Alternative 2 Habitat Restoration Actions  
and Select Facilities Actions





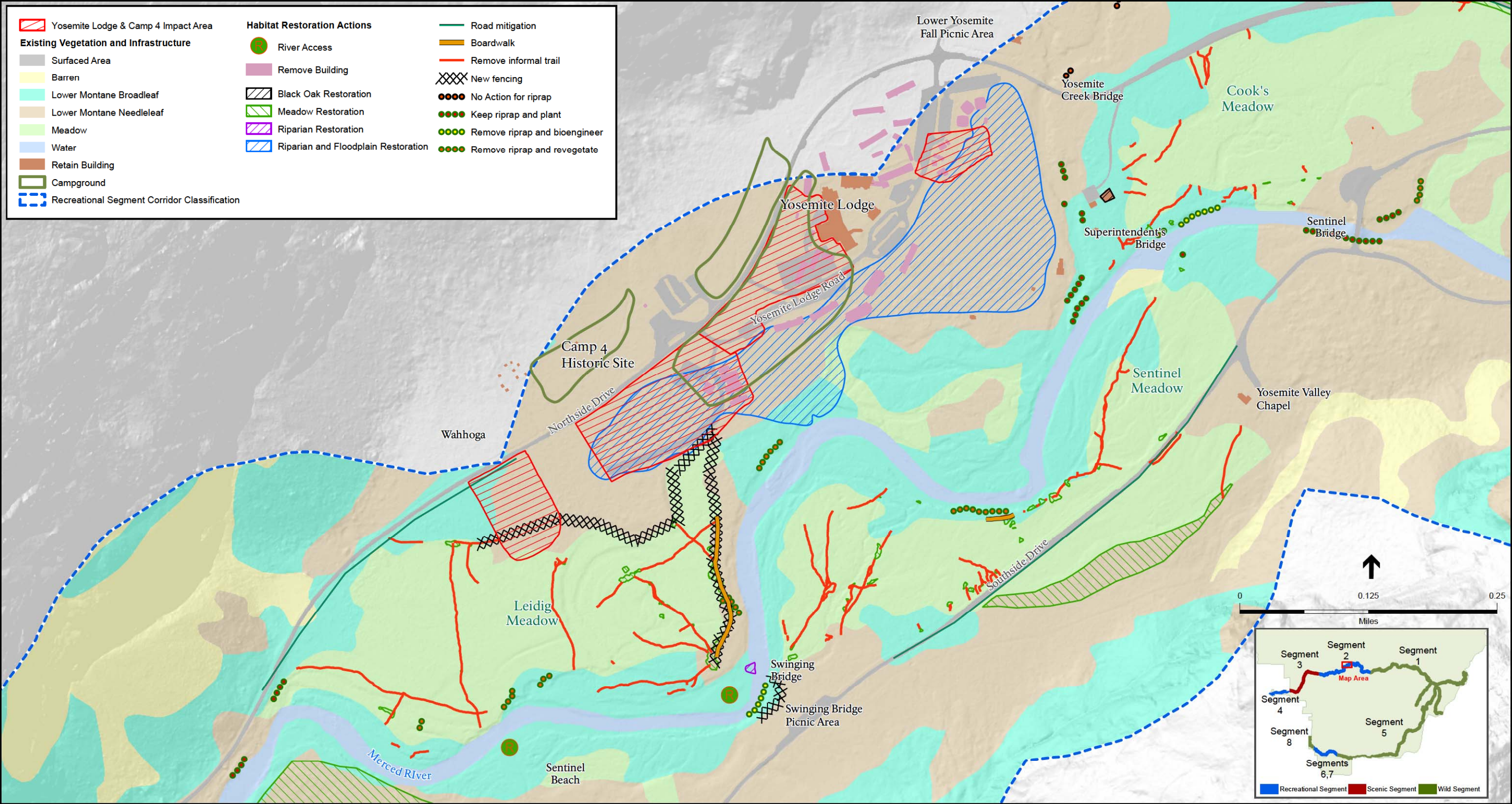
SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-18**

Yosemite Village Area: Alternative 2 Habitat Restoration Actions and Select Facilities Actions

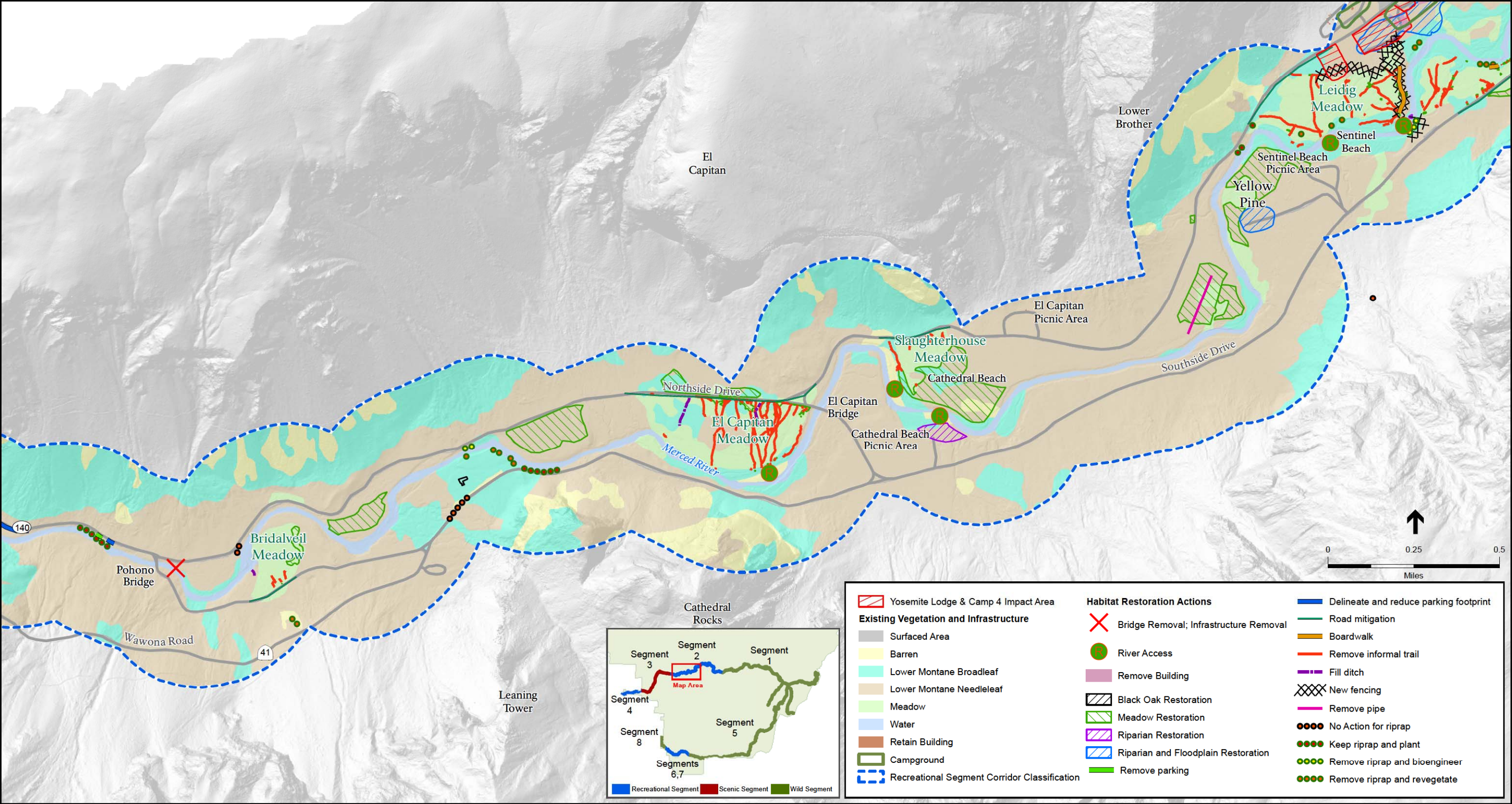




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-19**  
Yosemite Lodge Area: Alternative 2 Habitat Restoration Actions and Select Facilities Actions





SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-20**  
West Yosemite Valley: Alternatives 2 Habitat Restoration Actions  
and Select Facilities Actions

**TABLE 9-13: SEGMENT 2 VEGETATION RESTORATION UNDER ALTERNATIVE 2<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Urban/Developed	0.4	Barren	0	Meadow	20
Intermittently to seasonally flooded meadow	15	Meadow	18		
Semi-permanently to permanently flooded meadow	3				
Sparsely vegetated undifferentiated	2	Sparsely vegetated	2		
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	16	Lower montane broadleaf	16
California black oak forest alliance	7				
California black oak /(bracken fern) forest mapping unit	8				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1	Lower montane needleleaf	75	A mosaic of meadow, black oak, and open canopy coniferous forest	75
Ponderosa pine woodland alliance	0.3				
Ponderosa pine-incense cedar forest alliance	27				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	47				
Urban/Developed	9	Barren	9	Riparian & floodplain	152
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	1		
Ponderosa pine-incense cedar forest alliance	73	Lower montane needleleaf	142		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	68				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	8	Lower montane needleleaf	8	Riparian	8
Total	271		271		271

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.



**TABLE 9-14: SEGMENT 2 WETLAND RESTORATION UNDER ALTERNATIVE 2**

Wetland Type	Acres
<b>Segment 2</b>	
Palustrine Emergent	20.07
Palustrine Forested	26.23
Palustrine Scrub Shrub	1.62
<b>Total amount of wetlands restored</b>	<b>47.92</b>
SOURCE: NPS 2012c	

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6, the NPS would remove all informal trails and reduce roadside parking through alternative striping and consolidate parking to the west end of the meadow to reduce impacts to El Capitan Meadow. Restoration of El Capitan Meadow and elimination of roadside parking adjacent to the meadow would result in local, long-term, minor, and beneficial impacts on vegetation from reduction in trampling from foot traffic and impacts to meadow habitat associated with roadside parking.

***Ahwahnee Meadow:*** Specific actions under Alternative 2 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible, removing 900 feet of Northside Drive and relocating the bike path to the south of Ahwahnee Meadow, and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on vegetation at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

***Stoneman Meadow:*** Under Alternative 2, the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boys Town area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275 feet). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on meadow vegetation.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 2 include restoring 30 acres of the 10-year floodplain. Under Alternative 2, the park would remove the remaining asphalt, decompact soils of former roads and campsites, and re-establish seasonal channels and natural topography that have been filled. Additionally, the park would remove the Lower River amphitheater structure and fill. Following habitat restoration, temporary fencing would be installed to protect the restoration areas and to allow for recovery. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on riparian vegetation.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and

development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 2 include: relocating unimproved Camp 6 parking and rerouting a portion of Northside Drive; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats, resulting in segmentwide, long-term, moderate beneficial impacts on plant communities and wetlands in Segment 2.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 2 would significantly reduce the maximum daily visitation to Yosemite Valley from current levels to facilitate maximum resource restoration and reduce crowding and congestion within Segment 2. Actions to manage visitor use and facilities under Alternative 2, specifically those concerning vehicle access and number of overnight accommodations, would result in a 33% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 13,900. Day use visitation would decrease by 36%, while overnight visitation would decrease by 26%. Under Alternative 2, there would also be a reduction in Valley lodging units. Changes in lodging would include the removal of units from Housekeeping Camp, conversion of the Yosemite Lodge to a day use facility, and an increase in units at Curry Village. The park would reduce the total number of campsites within the Valley. This change stems largely from campsite removals at Upper Pines, Lower Pines, and North Pines campgrounds, and additions at Yosemite Lodge.

Actions to significantly limit day use activities, overnight capacities, and day parking would effectively reduce the built environment and human presence within the Valley. Restoration of habitat following the removal of facilities and parking lots would increase the extent and contiguity of plant communities and wetlands; limiting day use activities and roadside parking would reduce impacts on sensitive habitats, such as riparian woodland and wet meadows; and reducing overnight capacities would reduce human pressures on vegetation and wetlands in general.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as

applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to local, minor and adverse.

The overall reduction in infrastructure, lodging units, and campsites and subsequent restoration under Alternative 2 would benefit vegetation communities in Yosemite Valley in the long-term. These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

**Curry Village & Campgrounds.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Curry Village include the construction of 78 hard-sided units at Boys Town. The units would be constructed within previously developed areas as well as within vegetation communities adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct, temporary and permanent losses of native vegetation and wetlands (see table 9-15) as well as redevelopment of existing developed areas. Outside of previously developed areas, impacts to vegetation would occur in lower montane coniferous forest and, to a much lesser extent, meadow. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-15 below, only a small percentage of these vegetation communities would be affected by the facility actions at Curry Village. Impacts to meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, vegetation communities at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-15: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 2**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.03	<0.1%
Lower Montane Coniferous	6.35	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
Wetland (Palustrine Emergent)	0.04	<0.1%
Wetland (Riverine Intermittent)	0.02	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Direct impacts to vegetation, including trampling or removal of rooted vegetation, would cause a reduction of the total numbers of plants and/or a reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts could also include decrease plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

Vegetation that would be removed at Curry Village under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Curry Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands associated with Stoneman Meadow and intermittent channels flowing through the area. Approximately 0.06 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 2. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

**Camp 6 and Yosemite Village.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center Parking Area would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and out of the dynamic 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems. Expanded parking areas and new road construction activities at Yosemite Village would result in direct, temporary and permanent losses of native vegetation and wetlands (see **table 9-16**) as well as redevelopment of existing disturbed areas.

As noted in table 9-16, over half of the area affected by the above actions would occur at sites that are already developed. Outside of previously developed areas, impacts to vegetation would occur entirely in lower montane broadleaf forest and lower montane coniferous forest; these types are among the most dominant native vegetation communities in Segment 2. Losses to these communities would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-16, only a small percentage of these vegetation communities would be

**TABLE 9-16: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 2**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Lower Montane Coniferous	9.03	0.1%
Lower Montane Broadleaf	1.37	<0.1%
Redevelopment <sup>b</sup>	11.55	N/A
Wetland (Palustrine Emergent)	0.77	0.3%
Wetland (Palustrine Forested)	1.52	1.3%
Wetland (Riverine Intermittent)	0.35	0.2%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

impacted by the actions at Camp 6 and Yosemite Village. In addition, potentially affected vegetation is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

Vegetation that would be removed at Camp 6 and Yosemite Village under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse. The rerouting of Northside Drive at Camp 6 outside the 10-year floodplain would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

Parking areas and new road construction activities at Camp 6 and Yosemite Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands located adjacent to the Northside Drive and Sentinel Crossover intersection, palustrine forested wetlands associated with the Merced River, and intermittent channels flowing through the area. Approximately 2.61 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 2. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow,

circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

**Yosemite Lodge and Camp 4.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include the conversion of Yosemite Lodge to a day-use facility and the addition of 250 parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day use parking spaces and area for 15 tour buses; the removal of old and temporary housing at Highland Court and the Thousands Cabins; the conversion of Highland Court to a walk-in campground; and the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of native vegetation and wetlands as well as the redevelopment of existing disturbed areas (table 9-17). Impacts to vegetation would occur entirely in lower montane coniferous forest, the dominant natural vegetation community in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-17, only a small percentage of this vegetation community would be impacted. In addition, potentially affected vegetation communities are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-17: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 2**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.12	<0.1%
Lower Montane Coniferous	14.90	0.2%
Lower Montane Broadleaf	0.57	<0.1%
Redevelopment <sup>b</sup>	3.69	N/A
Wetland (Palustrine Emergent)	0.12	<0.1%
Wetland (Riverine Intermittent)	0.03	<0.1%
Wetland (Riverine Perennial)	0.02	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like other development actions proposed under this alternative, vegetation that would be removed at Yosemite Lodge under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Yosemite Lodge and Camp 4 would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur to palustrine emergent wetlands along the Merced River and in intermittent channels flowing through the area. Approximately 0.17 acre of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions at Yosemite Lodge and Camp 4 under Alternative 2. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

As summarized in table 9-18, actions to manage visitor use and facilities would result in the loss of approximately 32.37 acres of vegetation primarily located near previously developed areas, resulting in a long-term, local, minor, adverse impacts to the affected plant communities. Actions to manage visitor use and facilities would result in the loss of 2.87 acres of potentially jurisdictional wetlands.

**TABLE 9-18: SUMMARY OF VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 2**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.15	<0.1%
Lower Montane Coniferous	30.28	0.4%
Lower Montane Broadleaf	1.94	<0.1%
Redevelopment <sup>b</sup>	17.21	N/A
Wetland	2.87	0.5%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		



**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of approximately 271 acres of vegetation and 47.92 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in the loss of approximately 32.37 acres of vegetation primarily located near previously developed areas, resulting in a long-term, local, minor to moderate, adverse impacts to the affected plant communities. Actions to manage visitor use and facilities would result in the loss of 2.87 acres of potentially jurisdictional wetlands.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Currently, vehicles park under the dripline of the 38 valley oak trees. This practice compacts soil under the trees, affecting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 2, valley oaks in El Portal would be enhanced by creating an oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in El Portal.

The types of habitat that would be affected by these restoration actions in Segment 4, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-19** and **9-20**. A total of 13 acres of vegetation would be enhanced or restored in Segment 4, including 0.05 acre of wetlands (this includes restoration actions common to Alternatives 2-6).

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 2, user capacity is largely affected by the increase in employee housing at El Portal in this segment. In Alternative 2, NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat; employee parking would be added at Rancheria, El Portal, and Abbieville. While all new units would be constructed outside of the 100-year floodplain, they would fall within the Merced River corridor. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in Yosemite Valley (Segment 2). Administrative campsites from the Yellow Pine Campground would also be relocated to this area. The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at El Portal, as new construction would primarily occur in or adjacent to previously disturbed locations or in more

**TABLE 9-19: SEGMENT 4 VEGETATION RESTORATION UNDER ALTERNATIVE 2<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Valley oak woodland alliance	2	Foothill broadleaf woodland	2	Valley oak woodland	2
Sparsely vegetated riverine flat	2	Sparsely vegetated	2	Riparian & floodplain	11
canyon live oak-(Ponderosa pine-incense cedar) forest superassociation	9	Lower montane broadleaf	9		
<b>Total</b>	<b>13</b>		<b>13</b>		<b>13</b>

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**TABLE 9-20: SEGMENT 4 WETLAND RESTORATION UNDER ALTERNATIVE 2**

Wetland Type	Acres
<b>Segment 4</b>	
Palustrine Emergent	0.001
Palustrine Forested	0.05
<b>Total amount of wetlands restored</b>	<b>0.05</b>
SOURCE: NPS 2012c	

resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in El Portal.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 13 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.

### Segments 5, 6, 7, and 8: South Fork Merced River

#### *Impacts of Actions to Protect and Enhance River Values*

The Wawona Golf Course is located in a former meadow, altering vegetation patterns, compacting soils, and interrupting meadow hydrology. Under Alternative 2, the Wawona Golf Course would be decommissioned and the area restored to native meadow habitat through recontouring topography and re-vegetation. These actions would collectively improve meadow and wetland habitat integrity,

increase the extent of Wawona Meadow, and enhance contiguity of the meadow habitat with the rest of Wawona Meadow. These actions would also enhance hydrological connectivity between meadow, riparian, and floodplain habitats. Overall, these actions would result in a local, long-term, major, beneficial impact on plant communities and wetlands in Wawona.

The types of habitat that would be affected by these restoration actions in Segment 7, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-21**. A total of 52 acres of vegetation would be restored in Segment 7 (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-21: SEGMENT 7 VEGETATION RESTORATION UNDER ALTERNATIVE 2<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Urban/Developed	40	Barren	40	Meadow	40
Ponderosa pine woodland alliance	3	Lower montane needleleaf	3	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Ponderosa pine-incense cedar forest alliance	8	Lower montane needleleaf	8	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	9
Ponderosa pine woodland alliance	1	Lower montane needleleaf	1		
<b>Total</b>	<b>52</b>		<b>52</b>		<b>52</b>

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 7 under Alternative 2 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 2, the operations of the Wawona Stables would be eliminated and two stock campsites would be relocated to this area from the current Wawona Stock Camp. The Wawona tennis courts would be removed. Campsites in Wawona Campground are located in proximity to the river, resulting in trampling of riparian vegetation and riverbank erosion. Under Alternative 2, campsites within the 100-year floodplain would be removed and the area would be restored. Soils would be decompacted and the area would be replanted with riparian vegetation. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 32 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce

visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 2 would result in the restoration of 52 acres of vegetation, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.

### **Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Alternative 2 would restore up to approximately 347 acres of vegetation, including 47.97 acres of wetlands, as a result of actions common to Alternatives 2-6 and those specific to Alternative 2. Actions to manage visitor use and facilities would result in the loss of 32.37 acres of vegetation and 2.87 acres of wetlands as a result of actions specific to Alternative 2.

Past development and human activity in the Merced River corridor have in some cases adversely affected vegetation communities and regional vegetation patterns. Actions associated with Alternative 2 are expected to have corridorwide, long-term, major, beneficial impacts on vegetation in the Merced River corridor. Restoration actions associated with Alternative 2 would restore meadow and riparian areas, improve and restore hydrologic function, and restore ecological integrity throughout the river corridor; remove and restore informal trails; and direct the public onto established trails and river access points. This is part of a comprehensive strategy to reduce existing adverse impacts on meadow, wetland, and riparian vegetation. Existing natural resource management actions, such as removal of nonnative invasive plants, would continue. Adverse effects from these actions would be local, short-term, and minor or negligible. Notable actions the NPS would implement under Alternative 2 include

- restricting recreational use of rivers and riverbanks to reduce riverbank erosion
- removing, restoring, relocating, or repurposing park facilities to efficiently utilize park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees
- managing total visitors to the park and visitor demands for day parking space, lodging, and camping space
- removing facilities within the 100-year floodplain of the Merced River and restoring riverbanks, meadows, and riparian habitat
- enhancing meadow, riparian, and river hydrologic function, complexity, and connectivity
- improving the free flow, complexity, and water quality of the Merced River

Generally, Alternative 2 is focused on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2), by emphasizing day use of the Valley over overnight stays; removing many facilities that are located in the 100-year floodplain and are jeopardized by flood; repurposing park facilities to improve efficiency of use; and providing adequate lodging, camping, and

parking space for visitors and employees. Adverse effects from these actions would be associated with the active construction or restoration phase, and would be local, short-term, and minor or negligible. Were all of these measures to be combined, the long-term effect would be a major, corridorwide, beneficial impact on vegetation communities as habitats are restored and fragmentation and edge effects reduced. These effects would be most pronounced in areas of high human use, such as Yosemite Valley and Wawona (Segments 2 and 7).

### **Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on vegetation resources are the same as those listed under the No Action Alternative. Alternative 2 would result in segmentwide, long-term, minor to moderate, beneficial impacts on vegetation communities within the Merced River corridor. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor. The past, present, and future actions in the region would have varying effects on vegetation and wetlands, with some projects restoring or enhancing vegetation and wetlands, and many others resulting in the loss or decline of vegetation and wetlands. For projects that would result in the loss of wetland features regulated under section 404 of the CWA, losses would be typically compensated at a ratio of 1:1 (no net loss). Compensation typically occurs through creation or enhancement of wetlands, either on-site or at a designated mitigation bank. However, even with these protections in place, wetlands may be lost over time through unregulated activities or negatively impacted through nonpoint source pollution, nonnative species, and changes in surface and subsurface hydrology over time.

The actions under Alternative 2 would have long-term, beneficial effects on vegetation and wetlands, including vegetation-related ORVs, within the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region (e.g., introduction and spread of nonnative species, direct displacement of vegetation by structures), the actions under Alternative 2 would have a minimal beneficial effect. Overall, cumulative actions on vegetation and wetlands would result in long-term, minor, adverse effects on regional vegetation patterns.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **Segment 1: Merced River above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 3, preliminary grazing capacities for the Merced Lake East Meadow would be developed. When the meadow recovers, administrative grazing at established capacities would be allowed. The meadow would be monitored annually for five years, and use levels would be adapted as needed. This adaptive management of grazing in the meadow would help protect meadow vegetation from the effects of high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits, and would benefit habitat

connectivity and meadow hydrology. These actions would result in long-term, local, minor beneficial impacts to vegetation.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Several actions related to management of visitor use and facilities would have the potential to affect vegetation and wetlands in Segment 1 under Alternative 3. Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 75), conversion of the Merced Lake High Sierra Camp, and wilderness campground modifications. Under Alternative 3, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed, resulting in approximately 11 acres of meadow and subalpine restoration. The area would be used as a temporary pack camp for up to 15 people. The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result primarily from the decrease in designated camping in Little Yosemite Valley Areas either closed or converted to dispersed camping would be restored to natural conditions, including restoration of native vegetation communities.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 1 and associated plant communities and wetlands. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 3 involve the conversion of the area to designated Wilderness, removal of all infrastructure from the Merced Lake High Sierra Camp, and use of the former camp area as a temporary stock camp. As discussed for Alternative 2, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1 by reducing effects on vegetation communities from concentrated visitor use.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 3 would have local, long-term, minor, beneficial impacts on plant communities and wetlands along the corridor.

## **Segment 2: Yosemite Valley**

### *Impacts of Actions to Protect and Enhance River Values*

Ecological management actions that would occur within Segment 2 under Alternative 3 in addition to those common to Alternatives 2-6 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Some of these actions are similar or identical to those proposed for Alternative 2. Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; rerouting the Valley Loop Trail through Slaughterhouse Meadow out of wetlands and meadows to an upland area; moving 780 feet of

the Valley Loop Trail out of Bridalveil Meadow; and removing several buildings at Yosemite Lodge out of the 100-year floodplain and restoring the area.

Habitat restoration actions in Segment 2 under Alternative 3 are displayed in **Figures 9-21 through 9-24**. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-22 and 9-23**. A total of 230 acres of vegetation would be restored in Segment 2, including 46.74 acres of wetlands (this includes restoration actions common to Alternatives 2-6).

Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the 2–10 year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

These restoration management actions would improve the hydrologic function and restore the ecological integrity of plant communities and wetlands in the Merced River corridor in Segment 2, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

#### **Biological Resource Actions.**

**Yosemite Valley Campgrounds:** Under Alternative 3, specific restoration actions to enhance the river's biological values in Segment 2 include removing all campsites within 150 feet of the bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, beneficial impacts to vegetation and wetlands.

**El Capitan Meadow:** In addition to actions common to Alternatives 2-6, the NPS would use restoration fencing and signing to designate appropriate meadow access points, remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on vegetation and wetlands from reduction of trampling from foot traffic that causes habitat fragmentation.

**Ahwahnee Meadow:** Similar to Alternative 2, specific actions under Alternative 3 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible; removing 900 feet of Northside Drive and relocating the bike path to the south of Ahwahnee Meadow; and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on vegetation and wetlands at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

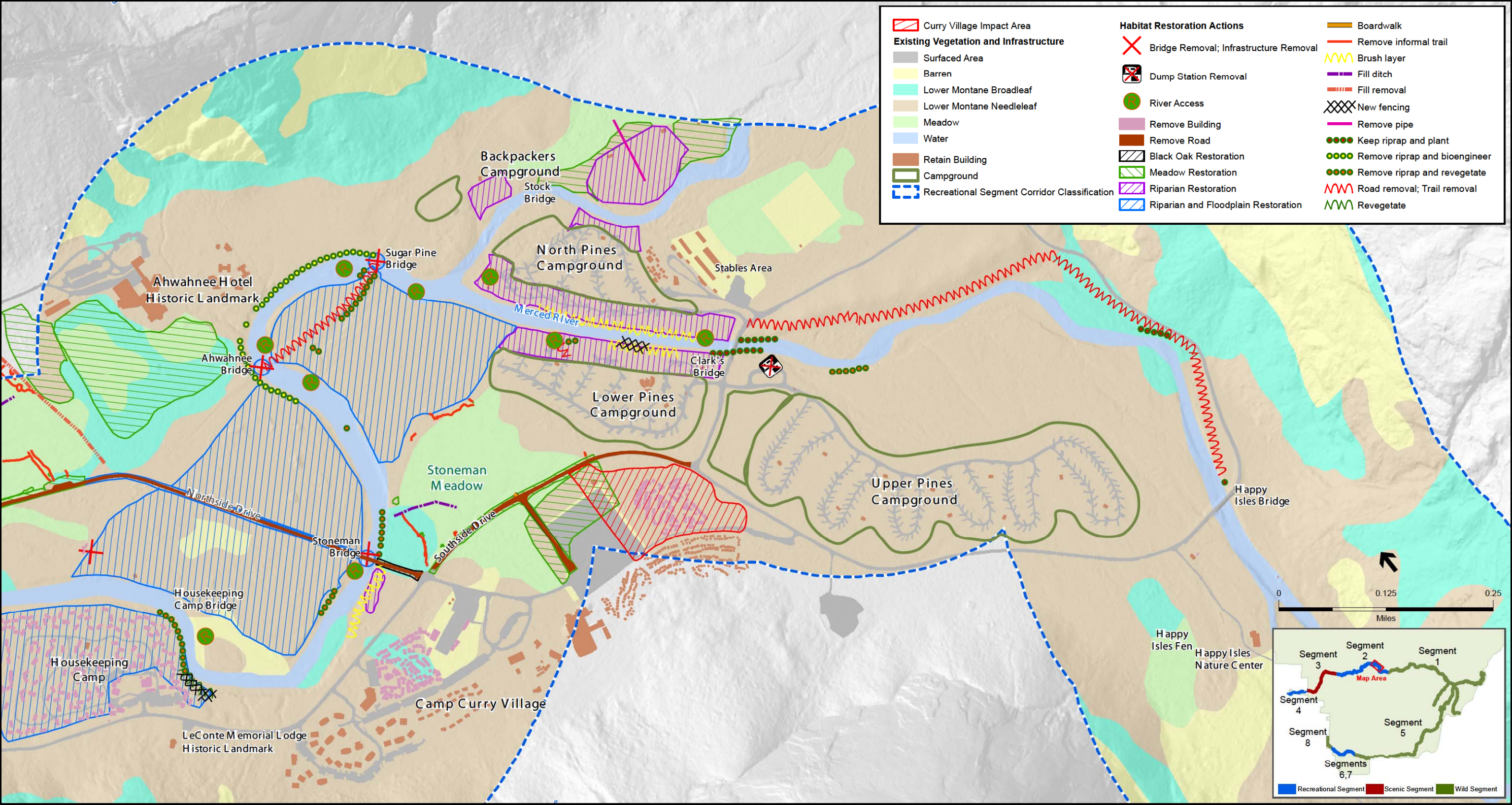


**TABLE 9-22: SEGMENT 2 VEGETATION RESTORATION UNDER ALTERNATIVE 3<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Urban/Developed	2	Barren	2	Meadow	21
Intermittently to seasonally flooded meadow	14	Meadow	17		
Semi-permanently to permanently flooded meadow	3				
Sparsely vegetated undifferentiated	2	Sparsely vegetated	2		
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	16	Lower montane broadleaf	16
California black oak forest alliance	7				
California black oak /(bracken fern) forest mapping unit	8				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1	Lower montane needleleaf	68	A mosaic of meadow, black oak, and open canopy coniferous forest	68
Ponderosa pine woodland alliance	1				
Ponderosa pine-incense cedar forest alliance	20				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	46				
Urban/Developed	7	Barren	7	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	105
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	1		
Ponderosa pine-incense cedar forest alliance	45	Lower montane needleleaf	97		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	52				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1				
Ponderosa pine-incense cedar forest alliance	8	Lower montane needleleaf	20	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	20
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	11				
Total	230		230		230

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

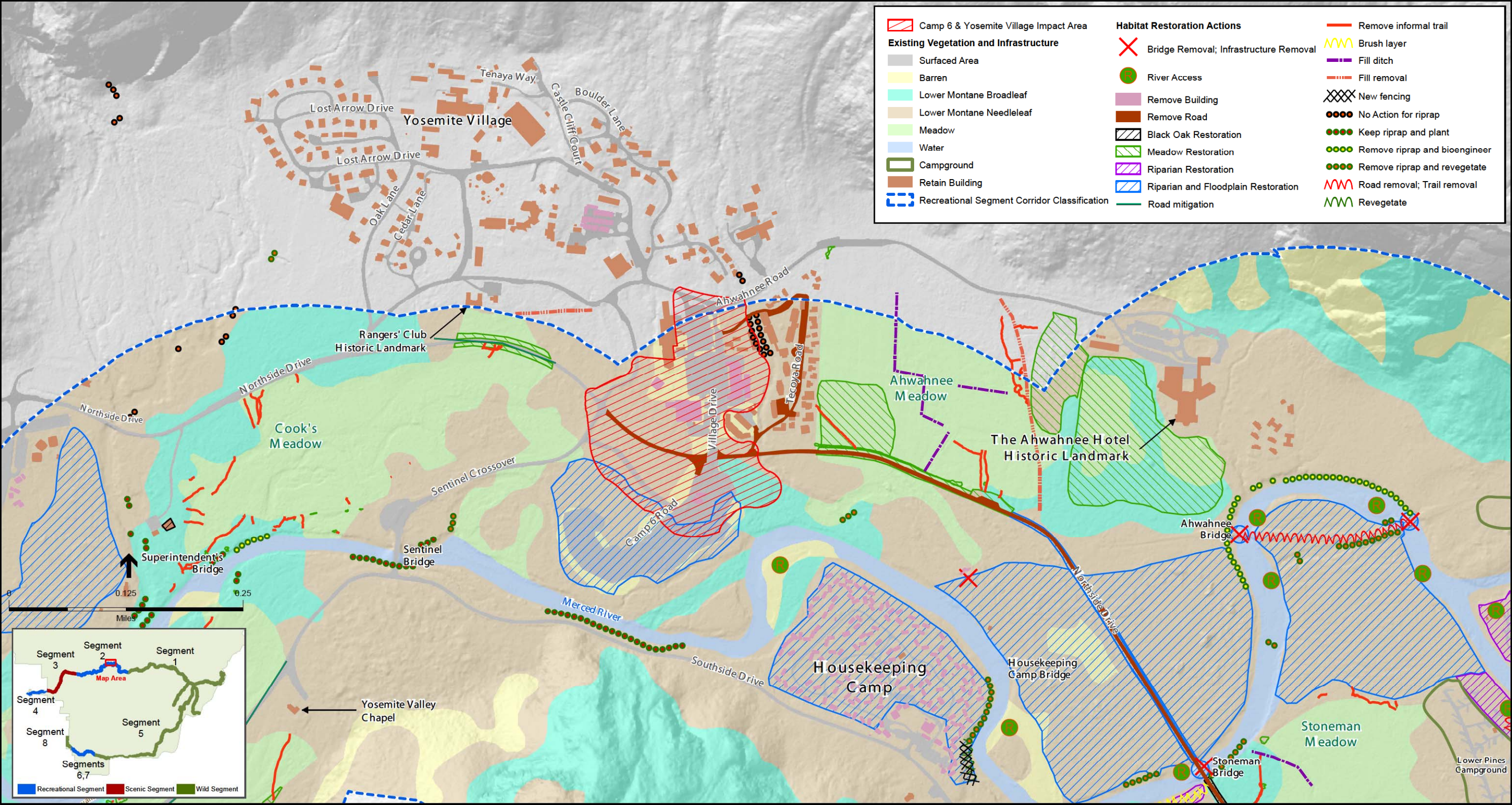




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-21**  
Curry Village Area: Alternative 3 Habitat Restoration Actions  
and Select Facilities Actions





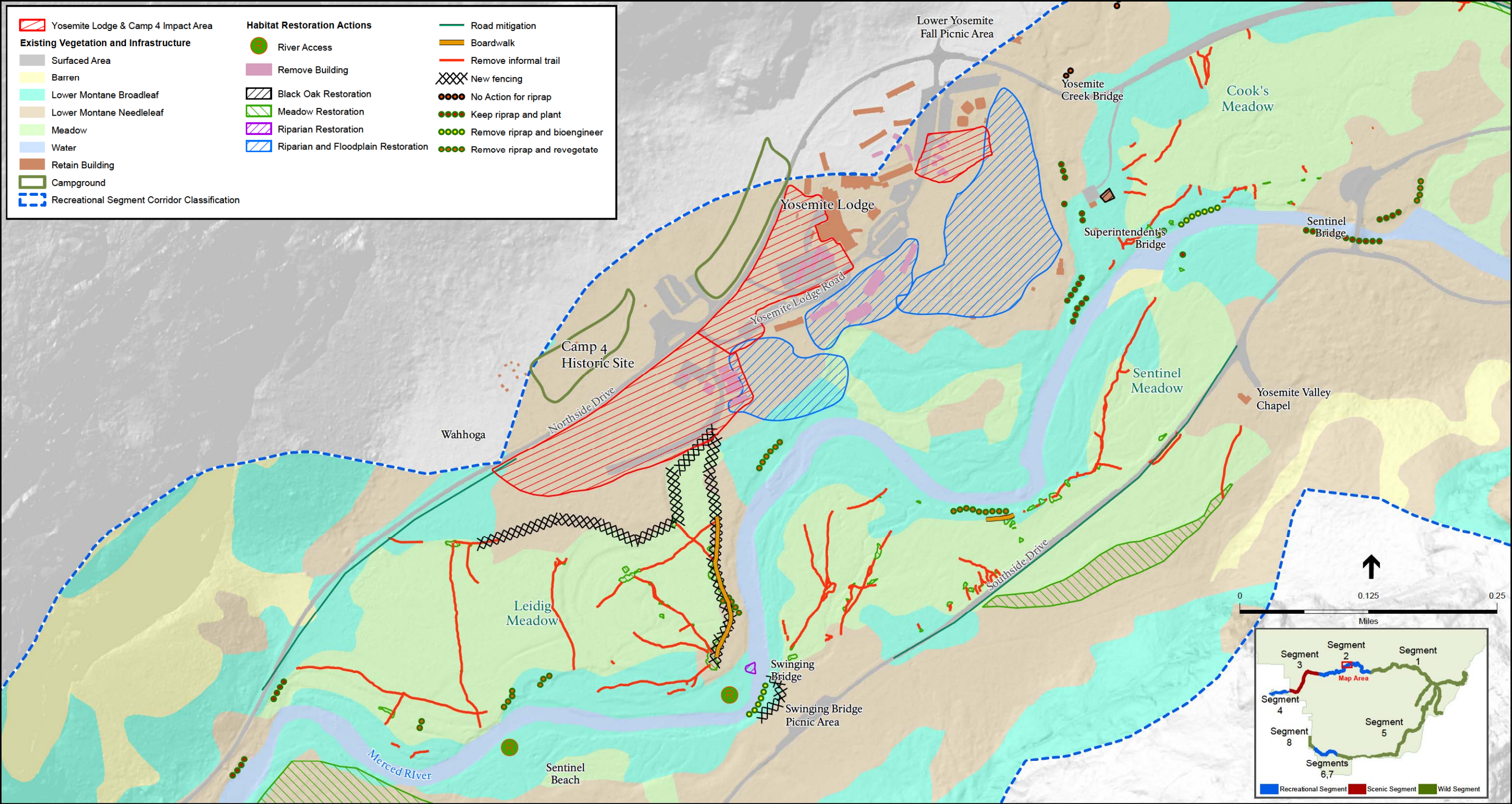
SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-22**

Yosemite Village Area: Alternative 3 Habitat Restoration Actions and Select Facilities Actions

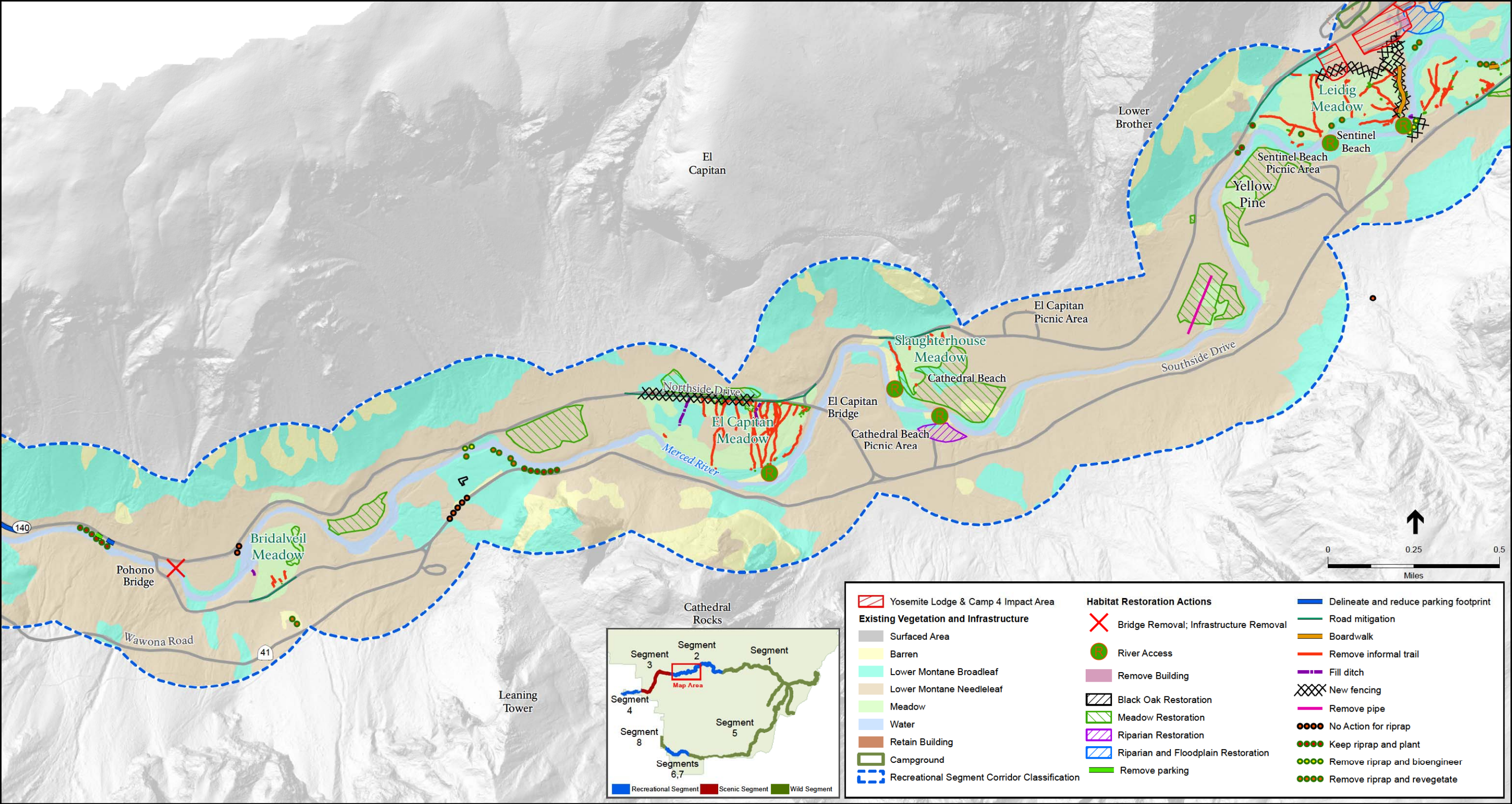




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-23**  
 Yosemite Lodge Area: Alternative 3 Habitat Restoration Actions  
 and Select Facilities Actions





SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-24**  
West Yosemite Valley: Alternatives 3 Habitat Restoration Actions  
and Select Facilities Actions



**TABLE 9-23: SEGMENT 2 WETLAND RESTORATION UNDER ALTERNATIVE 3**

Wetland Type	Acres
<b>Segment 2</b>	
Palustrine Emergent	19.64
Palustrine Forested	25.74
Palustrine Scrub Shrub	1.36
<b>Total amount of wetlands restored</b>	<b>46.74</b>
SOURCE: NPS 2012c	

**Stoneman Meadow:** Like Alternative 2, under Alternative 3 the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through the Boys Town area. The Orchard Parking Lot would be redesigned to promote water flow and improve meadow health by increasing drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended over wet areas to Curry Village (up to 275 feet). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, major beneficial impacts on vegetation and wetlands.

**Former Upper and Lower Rivers Campgrounds:** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 3 are similar to Alternative 2, which include restoring 30 acres of the 10-year floodplain. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, major beneficial impacts on vegetation and wetlands.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate to major beneficial impact on plant communities and wetlands in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 3 include: relocating unimproved Camp 6 parking; removing Stoneman, Ahwahnee and Sugar Pine bridges; and restoring these areas to natural conditions. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat throughout the segment. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats, resulting in segmentwide, long-term, moderate beneficial impacts on plant communities and wetlands in Segment 2.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Alternative 3 would reduce the maximum daily visitation allowed in Yosemite Valley from current levels to allow for increased resource restoration and reduce crowding and congestion. Actions to manage visitor use and facilities under Alternative 3, specifically those concerning vehicle access and number of overnight accommodations, would result in a 37% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 13,200. Day use visitation would decrease by 43%, while overnight visitation would decrease by 23%. Under Alternative 3, there would be a net reduction in Yosemite Valley lodging units. This is largely due to the removal of units from Housekeeping Camp, Curry Village, and Yosemite Lodge. The park would increase the total number of campsites within the Valley. This change is largely due to new campsite development east of Camp 4, west of Backpackers Campground, and in the Upper Pines Loop Addition.

Actions to significantly limit day use activities, overnight capacities, and day parking would effectively reduce the built environment and human presence within the Valley. Restoration of habitat following the removal of facilities and parking lots would increase the extent and contiguity of plant communities and wetlands; limiting day use activities and roadside parking would reduce impacts on sensitive habitats, such as riparian woodland and wet meadows; and reducing overnight capacities would reduce human pressures on vegetation and wetlands in general.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in Yosemite Valley.

The overall reduction in infrastructure, lodging units, and campsites and subsequent restoration under Alternative 3 would benefit vegetation communities in Yosemite Valley in the long-term. These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

**Curry Village & Campgrounds.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village and the rerouting of



South Side Drive at Boys Town. Construction activities at Curry Village would result in direct temporary and permanent losses of native vegetation and wetlands as well as the redevelopment of existing developed areas (**table 9-24**). Outside of previously developed areas, impacts to vegetation would primarily occur in lower montane coniferous forest and, to a much lesser extent, meadow. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-24 below, only a small percentage of these vegetation communities would be affected by the facility actions at Curry Village. Impacts to meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, vegetation communities at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-24: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 3**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.03	<0.1%
Lower Montane Coniferous	6.35	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
Wetland (Palustrine Emergent)	0.04	<0.1%
Wetland (Riverine Intermittent)	0.02	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Direct impacts to vegetation, including trampling or removal of rooted vegetation, would cause a reduction of the total numbers of plants and/or a reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts could also include decrease plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

Vegetation that would be removed at Curry Village under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Curry Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands associated with Stoneman Meadow and intermittent channels flowing through the area. Approximately 0.06 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 3. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

**Camp 6 and Yosemite Village.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the dynamic 10-year floodplain. The Camp 6/Village Center Parking Area would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and north of the 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems. Expanded parking areas and new road construction activities at Yosemite Village would result in direct temporary and permanent losses of native vegetation and wetlands (see **table 9-25**) as well as redevelopment of existing disturbed areas.

**TABLE 9-25: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 3**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Lower Montane Coniferous	9.03	0.1%
Lower Montane Broadleaf	1.37	<0.1%
Redevelopment <sup>b</sup>	11.55	N/A
Wetland (Palustrine Emergent)	0.77	0.3%
Wetland (Palustrine Forested)	1.52	1.3%
Wetland (Riverine Intermittent)	0.35	0.2%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

As noted in table 9-25, over half of the area affected by the above actions would occur at sites that area already developed. Outside of previously developed areas, impacts to vegetation would occur entirely in lower montane broadleaf forest and lower montane coniferous forest; these types are among the most dominant native vegetation communities in Segment 2. Losses to these communities would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-25, only a small percentage of these vegetation communities would be impacted by the actions at Camp 6 and Yosemite Village. In addition, potentially affect vegetation communities are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

Vegetation that would be removed at Camp 6 and Yosemite Village under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

The rerouting of Northside Drive outside the 10-year floodplain would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

Parking areas and new road construction activities at Camp 6 and Yosemite Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands located adjacent to the Northside Drive and Sentinel Crossover intersection, palustrine forested wetlands associated with the Merced River, and intermittent channels flowing through the area. Approximately 2.64 acres of potential jurisdictional wetland features would be directly and permanently impacted by proposed actions under Alternative 3. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

**Yosemite Lodge and Camp 4.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and

the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of native vegetation and wetlands as well as the redevelopment of existing disturbed areas (see table 9-26). Impacts to vegetation would occur entirely in lower montane coniferous forest, the dominant natural vegetation community in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-26, only a small percentage of this vegetation community would be impacted. In addition, potentially affected vegetation is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-26: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 3**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Lower Montane Coniferous	14.80	0.2%
Lower Montane Broadleaf	0.08	<0.1%
Redevelopment <sup>b</sup>	3.69	N/A
Wetland (Riverine Intermittent)	0.03	<0.1%
Wetland (Riverine Perennial)	0.02	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like other development actions proposed under this alternative, vegetation that would be removed at Yosemite Lodge under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Yosemite Lodge and Camp 4 would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur along the Merced River and in intermittent channels flowing through the area. Approximately 0.05 acres of potentially jurisdictional

wetland features would be directly and permanently impacted by the proposed actions under Alternative 3. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

In summary, as shown in table 9-27, actions to manage visitor use and facilities would result in the loss of 31.66 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts these communities. Actions to manage visitor use and facilities would result in the loss of 2.75 acres of potentially jurisdictional wetlands.

**TABLE 9-27: SUMMARY OF VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 3**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.03	<0.1%
Lower Montane Coniferous	30.18	0.4%
Lower Montane Broadleaf	1.45	<0.1%
Redevelopment <sup>b</sup>	17.21	N/A
Wetland	2.75	0.5%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 3 would result in the restoration of approximately 230 acres of vegetation and 39.85 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in the loss of 31.66 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts these communities. Actions to manage visitor use and facilities would result in the loss of 2.75 acres of potentially jurisdictional wetlands.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Currently, vehicles park under the dripline of the 38 valley oak trees. This practice compacts soil under the trees, affecting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 3, valley oaks in El Portal would be enhanced by creating an oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in El Portal.

The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-28 and 9-29**. A total of 13 acres of vegetation would be restored in Segment 4, including 0.05 acres of wetlands (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-28: SEGMENT 4 VEGETATION RESTORATION UNDER ALTERNATIVE 3<sup>a</sup>**

Current Vegetation	Acres	Current Vegetation Type	Acres	Proposed Future Vegetation Type	Acres Restored or Enhanced
Valley oak woodland alliance	1	Foothill broadleaf woodland	1	Valley oak woodland	1
Sparsely vegetated riverine flat	2	Sparsely vegetated	2	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	12
canyon live oak-(Ponderosa pine-incense cedar) forest superassociation	10	Lower montane broadleaf	13		
<b>Total</b>	<b>13</b>		<b>13</b>		<b>13</b>

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**TABLE 9-29: SEGMENT 4 WETLAND RESTORATION UNDER ALTERNATIVE 3**

Wetland Type	Acres
<b>Segment 4</b>	
Palustrine Emergent	0.001
Palustrine Forested	0.05
<b>Total amount of wetlands restored</b>	<b>0.05</b>
SOURCE: NPS 2012c	

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 3, user capacity is mostly affected by the increase in employee housing at El Portal. In Alternative 3, NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat; employee parking would be added at Rancheria, El Portal, and Abbieville. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in the valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at El Portal, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in El Portal.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 13 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

The Wawona Golf Course is located in a former meadow, altering vegetation patterns, compacting soils, and interrupting meadow hydrology. Under Alternative 3, the Wawona Golf Course would be decommissioned and the area restored to native meadow habitat through recontouring and revegetation. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats. Overall, these actions would result in a local, long-term, moderate, beneficial impact on plant communities and wetlands in Wawona.

The types of habitat that would be affected by these restoration actions in Segment 7, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-30**. A total of 48 acres of vegetation would be restored in Segment 7 (this includes restoration actions common to Alternatives 2-6).



**TABLE 9-30: SEGMENT 7 VEGETATION RESTORATION UNDER ALTERNATIVE 3<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Urban/Developed	40	Barren	40	Meadow	41
Ponderosa pine woodland alliance	1	Lower montane needleleaf	1		
Ponderosa pine-incense cedar forest alliance	1				
Ponderosa pine woodland alliance	1	Lower montane needleleaf	7	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	7
Ponderosa pine-incense cedar forest alliance	5				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	1				
Total	48		48		48

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 3, the operations of the Wawona stables would be eliminated and two stock campsites would be relocated to this area from the current Wawona stock camp. The Wawona tennis courts would be removed. The area would be restored to natural conditions. Soils would be decompacted and the area would be replanted with riparian vegetation. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 3 would result in the restoration of 48 acres of vegetation, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Alternative 3 would restore approximately 302 acres of vegetation, including 46.79 acres of wetlands, as a result of actions common to Alternatives 2-6 in conjunction with actions specific to Alternative 3. Actions to manage visitor use and facilities would result in the loss of approximately 31.66 acres of vegetation and the permanent loss of 2.75 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 3.

Past development and human activity in the Merced River corridor have in some cases adversely affected vegetation communities and regional vegetation patterns. Actions associated with Alternative 3 are expected to have corridorwide, long-term, major, beneficial impacts on vegetation in the Merced River corridor. Restoration actions associated with Alternative 3 would restore meadow and riparian areas, improve and restore hydrologic function, and restore ecological integrity throughout the corridor, remove and restore informal trails, and direct the public onto established trails and river access points. This is part of a comprehensive strategy to reduce existing adverse impacts on meadow, wetland, and riparian vegetation. Existing natural resource management actions, such as removal of nonnative invasive plants, would continue. Adverse effects from these actions would be local, short-term, and minor or negligible. Notable actions the park would implement under Alternative 3 include:

- restricting recreational use of rivers and riverbanks to reduce riverbank erosion
- removing, restoring, relocating, or repurposing park facilities to efficiently utilize park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees
- managing total visitors to the park and visitor demands for day parking space, lodging, and camping space
- removing facilities within 150 feet of the Merced River and restoring riverbanks, meadows, and riparian habitat
- enhancing meadow, riparian, and river hydrologic function, complexity, and connectivity
- improving the free flow, complexity, and water quality of the Merced River

Generally, Alternative 3 is focused on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2); removing many facilities that are located within 150 feet of the river and are jeopardized by flood; repurposing park facilities to improve efficiency of use and; providing adequate lodging, camping, and parking space for visitors and employees. Adverse effects from these actions would be associated with the active construction or restoration phase, and would be local, short-term, and minor or negligible. When combined, the long-term effect of all of these measures would be a major, corridorwide, beneficial impact on vegetation communities as habitats are restored and fragmentation and edge effects reduced. These effects would be most pronounced in areas of high human use, such as Yosemite Valley and Wawona (Segments 2 and 7).

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on vegetation resources are the same as those listed under Alternative 1. Alternative 3 would result in segmentwide, long-term, minor to moderate, beneficial impacts on vegetation communities within the Merced River corridor. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor. The past, present, and future actions in the region would have varying effects on vegetation and wetlands, with some projects restoring or enhancing vegetation and wetlands, and many others resulting in the loss or decline of vegetation and wetlands. For projects that would result in the loss of wetland features regulated under section 404 of the CWA, losses would be typically compensated at a ratio of 1:1 (no net loss). Compensation typically occurs through creation or enhancement of wetlands, either on-site or at a designated mitigation bank. However, even with these protections in place, wetlands may be lost over time through unregulated activities or negatively impacted through nonpoint source pollution, nonnative species, and changes in surface and subsurface hydrology over time.

The actions under Alternative 3 would have long-term, beneficial effects on vegetation and wetlands, including vegetation-related ORVs, within the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region (e.g., introduction and spread of nonnative species, direct displacement of vegetation by structures), the actions under Alternative 3 would have a minimal beneficial effect. Overall, cumulative actions on vegetation and wetlands would result in long-term, minor adverse effects on regional vegetation patterns.

### ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

#### **Segment 1: Merced River above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, grazing would be eliminated and administrative pack stock would be required to carry pellet feed in Merced Lake East Meadow, as described for Alternatives 2. Beneficial effects to vegetation would be the same as described for Alternative 2.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect vegetation and wetlands in Segment 1 under Alternative 4. Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 100), closure of the Merced Lake High Sierra Camp, and wilderness campground modifications. Under Alternative 4, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed, resulting in the restoration of approximately 11 acres of meadow and subalpine habitats. The park would reduce the total number of designated backpacker campsites within Wilderness. This change would result

primarily from the decrease in designated camping at Little Yosemite Valley Backpackers Campground and removal of bear boxes (composting toilet remains). Designated camping at Moraine Dome would continue and dispersed camping at the Merced Lake Backpackers Campground would be expanded in response to removal of designated campsites, but facilities would be reduced (i.e., flush toilets and wastewater system would be replaced with composting toilets and bear boxes removed).

These restoration management actions would improve hydrologic function and restore ecological integrity of the river corridor in Segment 1 and associated plant communities and wetlands. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 4 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and restoration of the former camp area to natural conditions. These actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1 by reducing impacts on vegetation communities from concentrated visitor use, overnight camping, and presence of infrastructure.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 4 would have local, long-term, minor, beneficial impacts on plant communities and wetlands in the river corridor.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Ecological management actions that would occur within Segment 2 under Alternative 4 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Some of these proposed actions are generally similar or identical those in Alternatives 2 and/or Alternative 3. Projects proposed in Segment 2 to protect and enhance river values, in addition to actions common to alternatives 2-6 involve rerouting the Valley Loop Trail through Slaughterhouse Meadow out of wetlands and meadows to an upland area; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; and moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow.

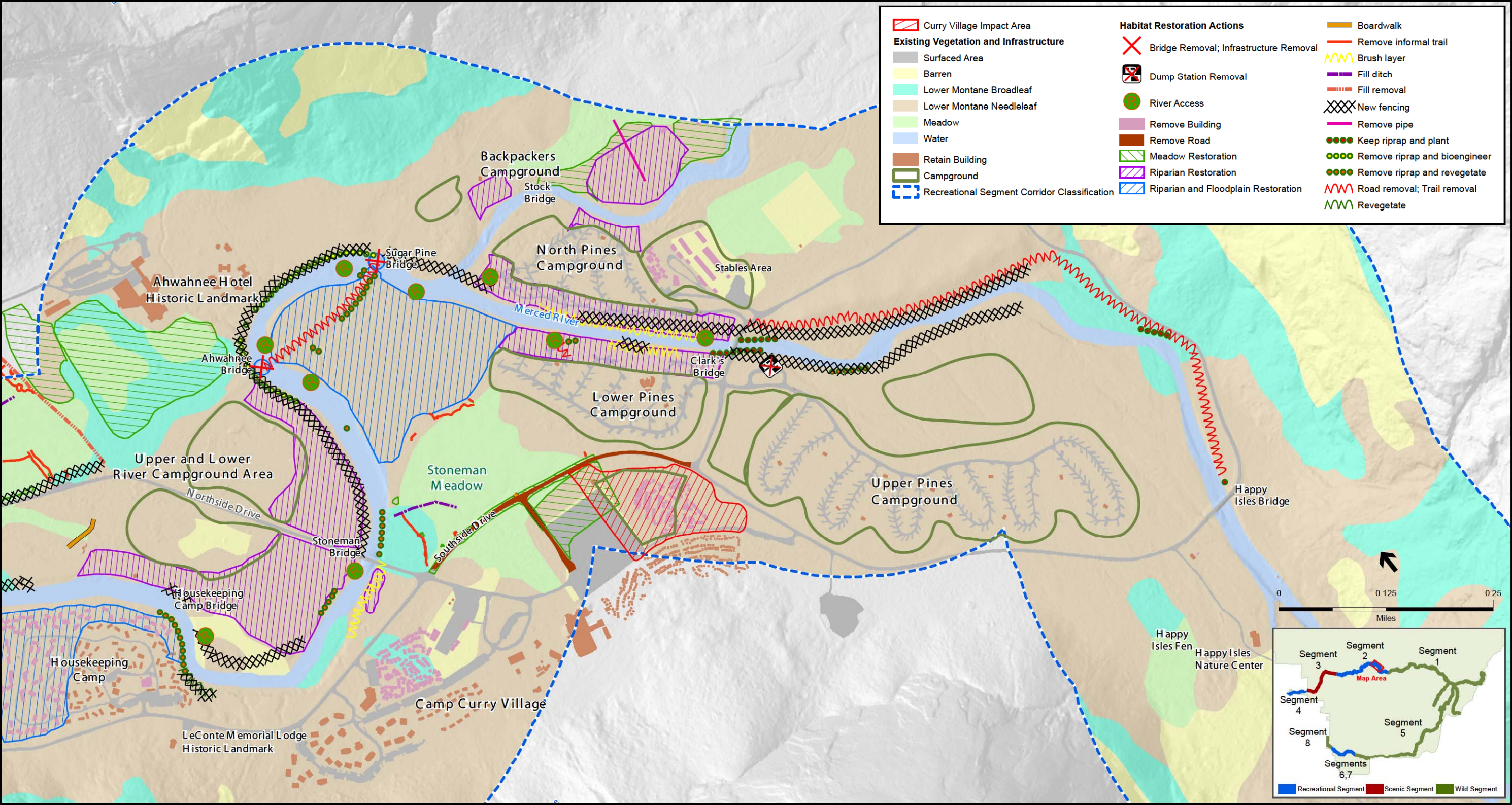
Habitat restoration actions in Segment 2 under Alternative 4 are displayed in **figures 9-25 through 9-28**. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-31 and 9-32**. A total of 194 acres of vegetation would be restored in Segment 2, including 44.52 acres of wetlands (this includes restoration actions common to Alternatives 2-6).

Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

**TABLE 9-31: SEGMENT 2 VEGETATION RESTORATION UNDER ALTERNATIVE 4<sup>a</sup>**

Current Vegetation	Acres	Current Vegetation Type	Acres	Proposed Future Vegetation Type	Acres Restored or Enhanced
Urban/Developed	2	Barren	2	Meadow	21
Intermittently to seasonally flooded meadow	14	Meadow	17		
Semi-permanently to permanently flooded meadow	3				
Sparsely vegetated undifferentiated	2	Sparsely vegetated	2		
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	15	Lower montane broadleaf	15
California black oak forest alliance	6				
California black oak /(bracken fern) forest mapping unit	8				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1	Lower montane needleleaf	67	A mosaic of meadow, black oak, and open canopy coniferous forest	67
Ponderosa pine woodland alliance	1				
Ponderosa pine-incense cedar forest alliance	20				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	45				
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	46
Ponderosa pine-incense cedar forest alliance	15	Lower montane needleleaf	45		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	29				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1				
Urban/Developed	4	Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	45
Ponderosa pine-incense cedar forest alliance	25	Lower montane needleleaf	41		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	16				
Total	194		194		194
a Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.					

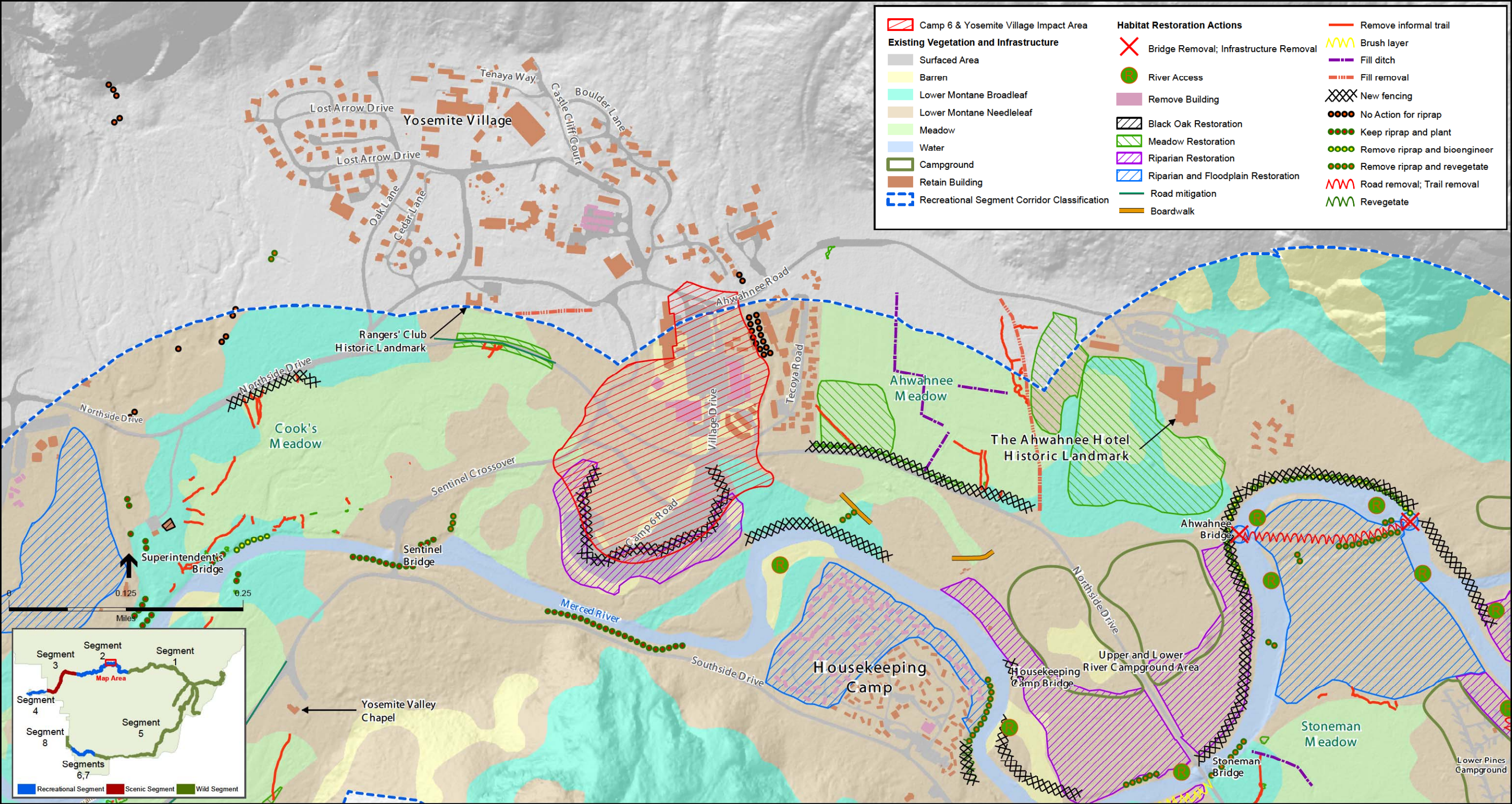




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-25**  
Curry Village Area: Alternative 4 Habitat Restoration Actions  
and Select Facilities Actions





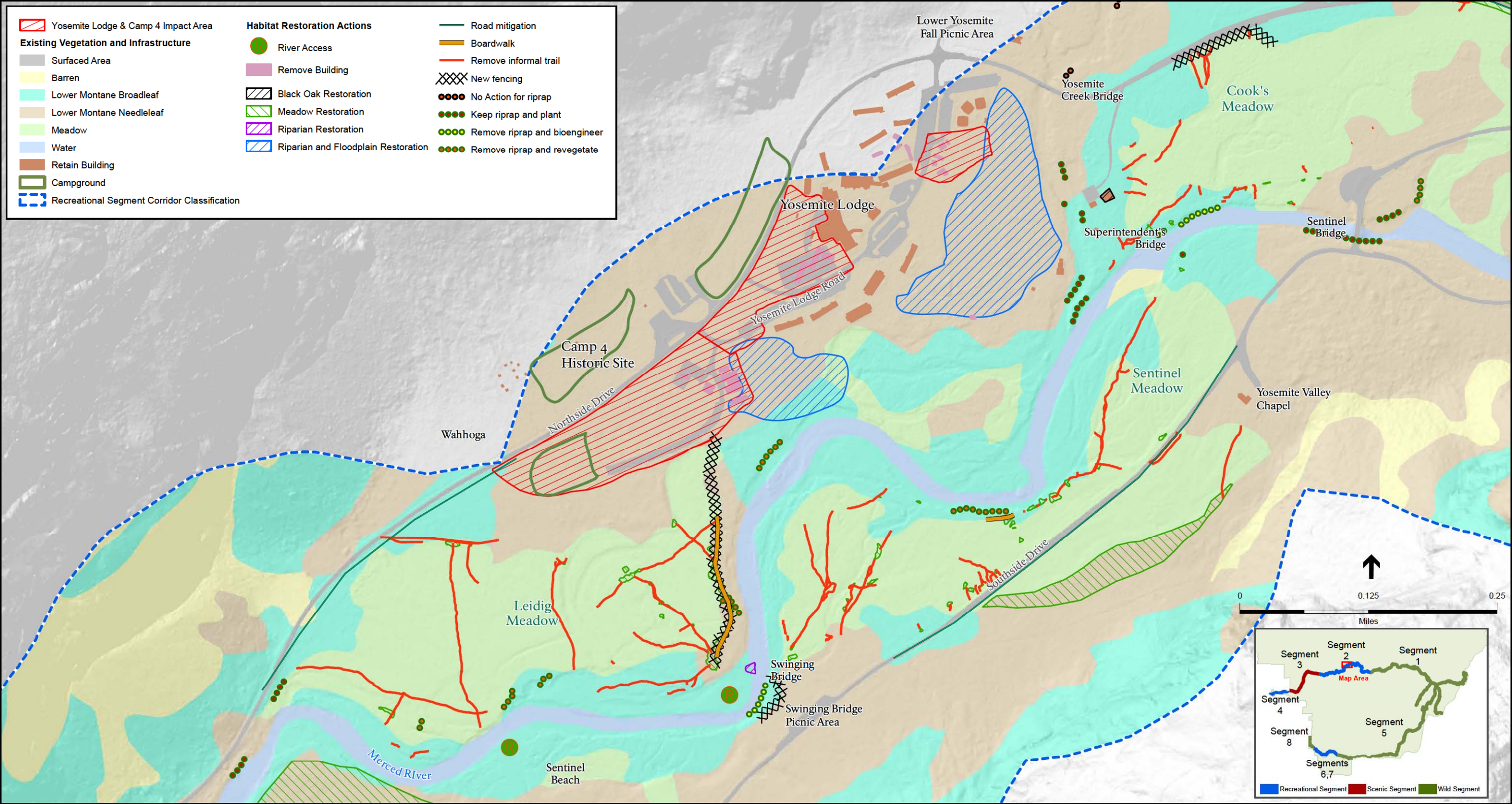
SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-26**

Yosemite Village Area: Alternative 4 Habitat Restoration Actions and Select Facilities Actions



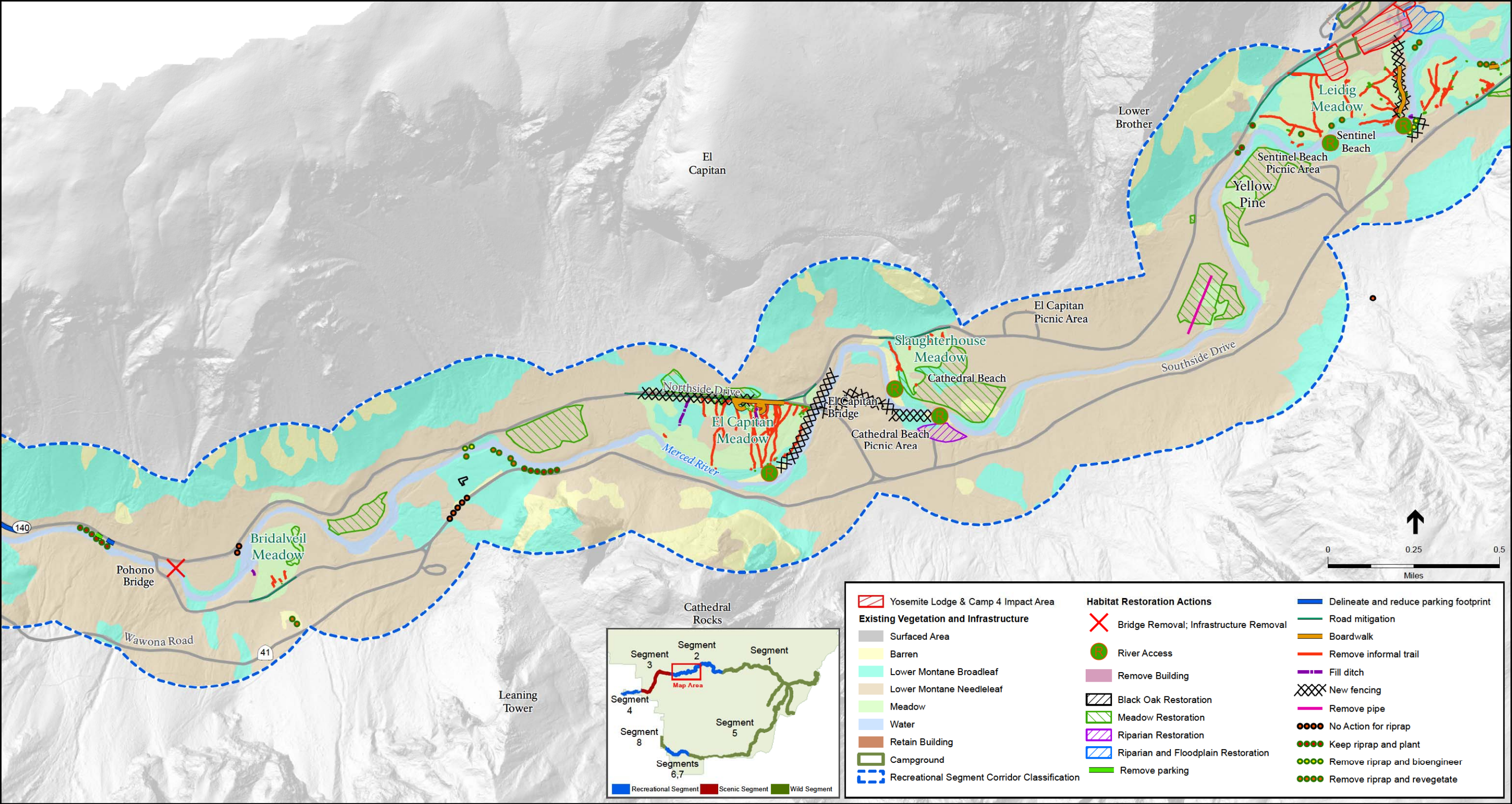


SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-27**  
Yosemite Lodge Area: Alternative 4 Habitat Restoration Actions and Select Facilities Actions





SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-28**  
West Yosemite Valley: Alternatives 4 Habitat Restoration Actions  
and Select Facilities Actions



**TABLE 9-32: SEGMENT 2 WETLAND RESTORATION UNDER ALTERNATIVE 4**

Wetland Type	Acres
<b>Segment 2</b>	
Palustrine Emergent	18.36
Palustrine Forested	24.96
Palustrine Scrub Shrub	1.20
<b>Total amount of wetlands restored</b>	<b>44.52</b>
SOURCE: NPS 2012c	

These restoration management actions would improve the hydrologic function and restore the ecological integrity of the plant communities and wetlands in the Merced River corridor in Segment 2, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in segment 2.

#### **Biological Resource Actions.**

**Yosemite Valley Campgrounds:** Like Alternative 3, specific restoration actions under Alternative 4 to enhance the river’s biological values in Segment 2 include removing all campsites within 150 feet of the bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, beneficial impacts to vegetation and wetlands.

**El Capitan Meadow:** In addition to actions common to Alternatives 2-6, Alternative 4 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 4 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on vegetation and wetlands from reduction of trampling from foot traffic that causes habitat fragmentation.

**Ahwahnee Meadow:** Specific actions under Alternative 4 in Segment 2 to enhance the river’s biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. However, unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 4. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, and beneficial impacts on vegetation and wetlands at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

**Stoneman Meadow:** Like Alternatives 2 and 3, specific actions in Alternative 4 to enhance the biological values of the Merced River include restoring Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boys Town area. The Orchard Parking Lot would be

redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275 feet). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on vegetation and wetlands.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 4 include restoring the topography of 16.5 acres of the floodplain. While this area is largely undeveloped, Alternative 4 would remove remaining asphalt, decompact soils of former roads and campsites re-establish river cut-off channels by removing imported fill, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling associated with new walk-in campgrounds. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, minor, and beneficial impacts on vegetation and wetlands.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, minor to moderate, beneficial impact on plant communities and wetlands in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 4 include: relocating unimproved Camp 6 parking; placing large wood and constructed logjams along the base of Stoneman Bridge; removing the Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats, resulting in segmentwide, long-term, moderate beneficial impacts on plant communities and wetlands in Segment 2.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 4 would reduce the maximum daily visitation allowed in Yosemite Valley from current levels to allow for increased resource restoration and reduce crowding and congestion. Actions to manage visitor use and facilities under Alternative 4, specifically those concerning vehicle access, would result in a 19% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 17,000. Day use visitation would decrease by nearly 29%. However, due in part to increases in campground facilities, overnight visitation would increase by about 7%. Under Alternative 4, there would be a net reduction in Valley lodging units. This would be achieved through removal of units from Housekeeping Camp and Curry Village. The park would increase the total number of campsites within the Valley. This increase would be largely due to the development of new campsites near Yosemite Lodge (west) and Camp 4 (east), as well as at Boys Town, Upper Pines Campground, Curry Village stables, and the former Upper River and Lower River campgrounds.

Restoring habitat following the removal of facilities and parking lots would increase the extent and contiguity of plant communities and wetlands; limiting day use activities and roadside parking would reduce impacts to sensitive habitats, such as riparian woodland and wet meadows; and reducing overnight capacities would reduce human pressures on plant communities and wetlands in general.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternative 4 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor to moderate, adverse impacts on plant communities in Yosemite Valley.

**Former Upper and Lower River Campground Area.** Construction of new walk-in campgrounds and picnic area in undeveloped areas at the former Upper and Lower Campgrounds would preclude the ecological restoration of the former riparian/wetland/California black oak complex in the area. Fencing along the riverbank would mitigate potential additional trampling damage to riparian areas. Construction activities at Upper and Lower River Campground would result in direct, temporary and permanent losses of native vegetation as well as the redevelopment of existing developed areas. Outside of previously developed areas, impacts to vegetation would occur in lower montane coniferous forest. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). Losses of vegetation communities, while long-term, would be local, adverse and moderate.

**Curry Village & Campgrounds.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village; the rerouting of South Side Drive at Boys Town; and the construction of a 40-site campground at Boys Town. Construction activities at Curry Village would result in direct, temporary and permanent losses of native vegetation and wetlands (see **table 9-33**) as well as the redevelopment of existing developed areas. Outside of previously developed areas, impacts to vegetation would occur in lower montane coniferous forest and, to a much lesser extent, meadow. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-33** below, only a small percentage of these vegetation communities would be affected by the facility actions at Curry Village. Impacts to meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, vegetation communities at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-33: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 4**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.03	<0.1 %
Lower Montane Coniferous	6.35	<0.1 %
Redevelopment <sup>b</sup>	1.97	N/A
Wetland (Palustrine Emergent)	0.04	<0.1 %
Wetland (Riverine Intermittent)	0.02	<0.1 %
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Direct impacts to vegetation, including trampling or removal of rooted vegetation, would cause a reduction of the total numbers of plants and/or a reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts could also include decrease plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

Vegetation that would be removed at Curry Village under Alternative 4 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Curry Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands associated with Stoneman Meadow and intermittent channels flowing through the area. Approximately 0.06 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 4. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.



**Camp 6 and Yosemite Village.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area would be formalized to include 750 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. The intersection at Northside Drive and Village Drive (Camp 6 intersection) would be re-aligned to meet standards for a proper four-way intersection and improve performance. A three-way intersection at Sentinel Drive and the entrance to the parking area would be added to improve traffic flow and alleviate congestion. An entry road to Camp 6 parking lot from Sentinel Drive would be added to improve traffic flow and alleviate congestion at nearby intersections. On-grade pedestrian crossings with proper sight lines would be provided to alleviate pedestrian/vehicle conflicts. Expanded parking area and new road construction activities at Yosemite Village would result in direct temporary and permanent losses of native vegetation and wetlands as well as redevelopment of existing disturbed areas (see table 9-34).

**TABLE 9-34: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 4**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.28	<0.1%
Lower Montane Coniferous	12.22	0.2%
Lower Montane Broadleaf	0.81	<0.1%
Redevelopment <sup>b</sup>	14.18	N/A
Wetland (Palustrine Emergent)	1.21	0.4%
Wetland (Palustrine Forested)	0.96	0.8%
Wetland (Riverine Intermittent)	0.39	0.3%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

As noted in table 9-34, over half of the area affected by the above actions would occur at sites that are already developed. Outside of previously developed areas, impacts to vegetation would occur almost entirely in lower montane broadleaf forest and lower montane coniferous forest; these types are among the most dominant native vegetation communities in Segment 2. Impacts to meadow habitat would occur in an area currently impacted by its proximity to Sentinel Drive. Losses to these communities would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-34, only a small percentage of these vegetation communities would be impacted by the actions at Camp 6 and Yosemite Village. In addition, potentially affected vegetation communities are adjacent to already developed areas, and therefore experience high levels of visitation

and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

Vegetation that is removed at Yosemite Village under Alternative 4 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Parking areas and new road construction activities at Camp 6 and Yosemite Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands located adjacent to the Northside Drive and Sentinel Crossover intersection, palustrine forested wetlands associated with the Merced River, and intermittent channels flowing through the area. Approximately 2.56 acres of potential jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 4. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, moderate and adverse.

**Yosemite Lodge and Camp 4.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of native vegetation and wetlands as well as the redevelopment of existing disturbed areas (see table 9-35). Impacts to vegetation would occur entirely in lower montane coniferous forest, the dominant natural vegetation community in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-35, only a small percentage of this vegetation community would be impacted. In addition, potentially affected vegetation is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-35: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 4**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Lower Montane Coniferous	14.80	0.2%
Lower Montane Broadleaf	0.08	<0.1%
Redevelopment <sup>b</sup>	3.69	N/A
Wetland (Riverine Intermittent)	0.03	<0.1%
Wetland (Riverine Perennial)	0.02	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like other development actions proposed under this alternative, vegetation that is removed at Yosemite Lodge and Camp 4 under Alternative 4 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Yosemite Lodge and Camp 4 would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur along the Merced River and in intermittent channels flowing through the area. Approximately 0.05 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 4. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

In summary, as shown in **table 9-36**, actions to manage visitor use and facilities would result in the loss of 34.57 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the permanent loss of 2.67 acres of potentially jurisdictional wetlands.

**TABLE 9-36: SUMMARY OF VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 4**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.31	<0.1%
Lower Montane Coniferous	33.37	0.5%
Lower Montane Broadleaf	0.89	<0.1%
Redevelopment <sup>b</sup>	19.84	N/A
Wetland	2.67	0.4%5
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 4 would result in the restoration of 194 acres of vegetation and 44.52 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in the loss of 34.57 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the permanent loss of 2.67 acres of potentially jurisdictional wetlands.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Currently, vehicles park under the dripline of the 38 valley oak trees. This practice compacts soil under the trees, affecting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limit the area where oak seedlings can be recruited. Under Alternative 4, valley oaks in El Portal would be enhanced by creating an oak recruitment area of one acre in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in El Portal.

The types of habitat that would be affected by these restoration actions in Segment 4, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-37 and 9-38**. A total of 12 acres of vegetation would be enhanced or restored in Segment 4, including 0.05 acres of wetlands (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-37: SEGMENT 4 VEGETATION RESTORATION UNDER ALTERNATIVE 4<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Valley oak woodland alliance	1	Foothill broadleaf woodland	1	Valley oak woodland	1
Sparsely vegetated riverine flat	2	Sparsely vegetated	2	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	11
canyon live oak-(Ponderosa pine-incense cedar) forest superassociation	9	Lower montane broadleaf	9		
<b>Total</b>	<b>12</b>		<b>12</b>		<b>12</b>

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**TABLE 9-38: SEGMENT 4 WETLAND RESTORATION UNDER ALTERNATIVE 4**

Wetland Type	Acres
<b>Segment 4</b>	
Palustrine Emergent	0.001
Palustrine Forested	0.05
<b>Total amount of wetlands restored</b>	<b>0.05</b>
SOURCE: NPS 2012c	

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 4, day parking would be expanded by 200 parking spaces at the Abbieville site; this area would be used primarily for visitor access to Yosemite Valley. NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat; a total of 292 employee parking spaces would be added at these locations. While all new units would be built outside of the 100-year floodplain, they would fall within the Merced River corridor. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in Yosemite Valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at El Portal, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce

short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in El Portal.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 12 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.

### Segments 5, 6, 7, and 8: South Fork Merced River

#### *Impacts of Actions to Protect and Enhance River Values*

The Wawona Golf Course would not be removed under Alternative 4, and therefore effects related to its continued operation would be the same as described for Alternative 1. Actions specifically targeted to protect culturally sensitive areas would also benefit vegetation and wetlands, including the relocation or removal of select campsites and stock campground sites that are within the 100-year floodplain or culturally sensitive areas. The removal of select campsites within the floodplain would result in a local, long-term, minor, beneficial impact on riparian vegetation.

The types of habitat that would be affected by these restoration actions in Segment 7, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-39**. A total of seven acres of vegetation would be restored in Segment 7 (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-39: SEGMENT 7 VEGETATION RESTORATION UNDER ALTERNATIVE 4<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Ponderosa pine woodland alliance	1	Lower montane needleleaf	7	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	7
Ponderosa pine-incense cedar forest alliance	5				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	1				
<b>Total</b>	<b>7</b>		<b>7</b>		<b>7</b>

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 4 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.



### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, the operations of the Wawona stables would be eliminated and two stock campsites would be relocated to this area from the current Wawona stock camp. The area would be restored. Soils would be decompacted and the area would be replanted with riparian vegetation. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 3 would result in the restoration of seven acres of vegetation, resulting in long-term, segmentwide, minor, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Alternative 4 would restore approximately 223 acres of vegetation, including 44.57 acres of wetlands, as a result of actions common to Alternatives 2-6 and those specific to Alternative 4. Actions to manage visitor use and facilities would result in the loss of approximately 34.57 acres of vegetation and the permanent loss of 2.67 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 4.

Past development and human activity in the Merced River corridor have in some cases adversely affected vegetation communities and regional vegetation patterns. Actions associated with Alternative 4 are expected to have corridorwide, long-term, moderate, beneficial impacts on vegetation in the Merced River corridor. Restoration actions associated with Alternative 4 would restore meadow and riparian areas, improve and restore hydrologic function and restore ecological integrity throughout the corridor, remove and restore informal trails, and direct the public onto established trails and river access points. This is part of a comprehensive strategy to reduce existing adverse impacts on meadow, wetland, and riparian vegetation. Existing natural resource management actions, such as removal of nonnative invasive plants, would continue. Adverse effects from these actions would be local, short-term, and minor or negligible. There would be local, long-term, moderate, adverse impacts on native vegetation communities from construction of some facilities. Notable actions the park would implement under Alternative 4 include

- restricting recreational use of rivers and riverbanks to reduce riverbank erosion
- removing, restoring, relocating, or repurposing park facilities to efficiently utilize park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees

- managing total visitors to the park and visitor demands for day parking space, lodging, and camping space
- removing facilities within 150 feet of the Merced River and restoring riverbanks, meadows, and riparian habitat
- enhancing meadow, riparian, and river hydrologic function, complexity, and connectivity
- improving the free flow, complexity, and water quality of the Merced River

Generally, Alternative 4 is focused on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2); removing many facilities that are located within 150 feet of the river and are jeopardized by flood; repurposing park facilities to improve efficiency of use; adding additional campground facilities; and providing adequate lodging, camping, and parking space for visitors and employees. Adverse effects from these actions would be associated with the active construction or restoration phase, and would be local, short-term, and minor or negligible. However, there would be local, long-term, moderate, adverse impacts on vegetation communities from construction of some facilities. These effects would be most pronounced in areas of high human use, such as Yosemite Valley and Wawona (Segments 2 and 7). When combined, the long-term effect of all of these measures would be a corridorwide, moderate, beneficial impact on vegetation communities as habitats are restored and fragmentation and edge effects reduced.

#### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on vegetation resources are the same as those listed under the No Action Alternative. Alternative 4 would result in segmentwide, long-term, minor to moderate, beneficial impacts on vegetation communities within the Merced River corridor. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor. The past, present, and future actions in the region would have varying effects on vegetation and wetlands, with some projects restoring or enhancing vegetation and wetlands, and many others resulting in the loss or decline of vegetation and wetlands. For projects that would result in the loss of wetland features regulated under section 404 of the CWA, losses would be typically compensated at a ratio of 1:1 (no net loss). Compensation typically occurs through creation or enhancement of wetlands either on-site or at a designated mitigation bank. However, even with these protections in place, wetlands may be lost over time through unregulated activities or negatively impacted through nonpoint source pollution, nonnative species, and changes in surface and subsurface hydrology over time.

The actions under Alternative 4 would have long-term, beneficial effects on vegetation and wetlands, including vegetation-related ORVs, within the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region (e.g., introduction and spread of nonnative species, direct displacement of vegetation by structures), the actions under Alternative 4 would have a minimal beneficial effect. Overall, cumulative actions on vegetation and wetlands would result in long-term, minor, adverse effects on regional vegetation patterns.

## ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to vegetation would be the same as described for Alternative 3.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect vegetation and wetlands in Segment 1 under Alternative 5. Visitation within Segment 1 would not be expected to change appreciably under Alternative 5; wilderness access quotas would remain as under Alternative 1 (No Action) and modifications to overnight accommodations would be nominal. Under Alternative 5, the Merced Lake High Sierra Camp would remain in operation and continue to host overnight guests and through-hikers during the summer months. However, the camp's 60 beds would be reduced to 42 (11 units). The park would not reduce the total number of designated campsites within the Merced River corridor's wilderness. Designated camping at Moraine Dome and Little Yosemite Valley Backpackers Campground would continue with overnight quotas of 150 people per day in Little Yosemite Valley. The Merced Lake Backpackers Campground would remain. Overall, these actions would result in a local, long-term, negligible, beneficial impact on plant communities and wetlands in Segment 1.

**Merced Lake High Sierra Camp.** The project-level actions in the Merced Lake High Sierra Camp area proposed under Alternative 5 involve retention of the Merced Lake High Sierra Camp, reducing the capacity to 42 beds, and replacing the flush toilets with composting toilets. These actions would result in a local, long-term, negligible, beneficial impact on plant communities and wetlands in Segment 1 by reducing impacts on vegetation communities from visitor use and presence of infrastructure.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 5 would have local, long-term, negligible, beneficial impacts on plant communities and wetlands in the river corridor.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

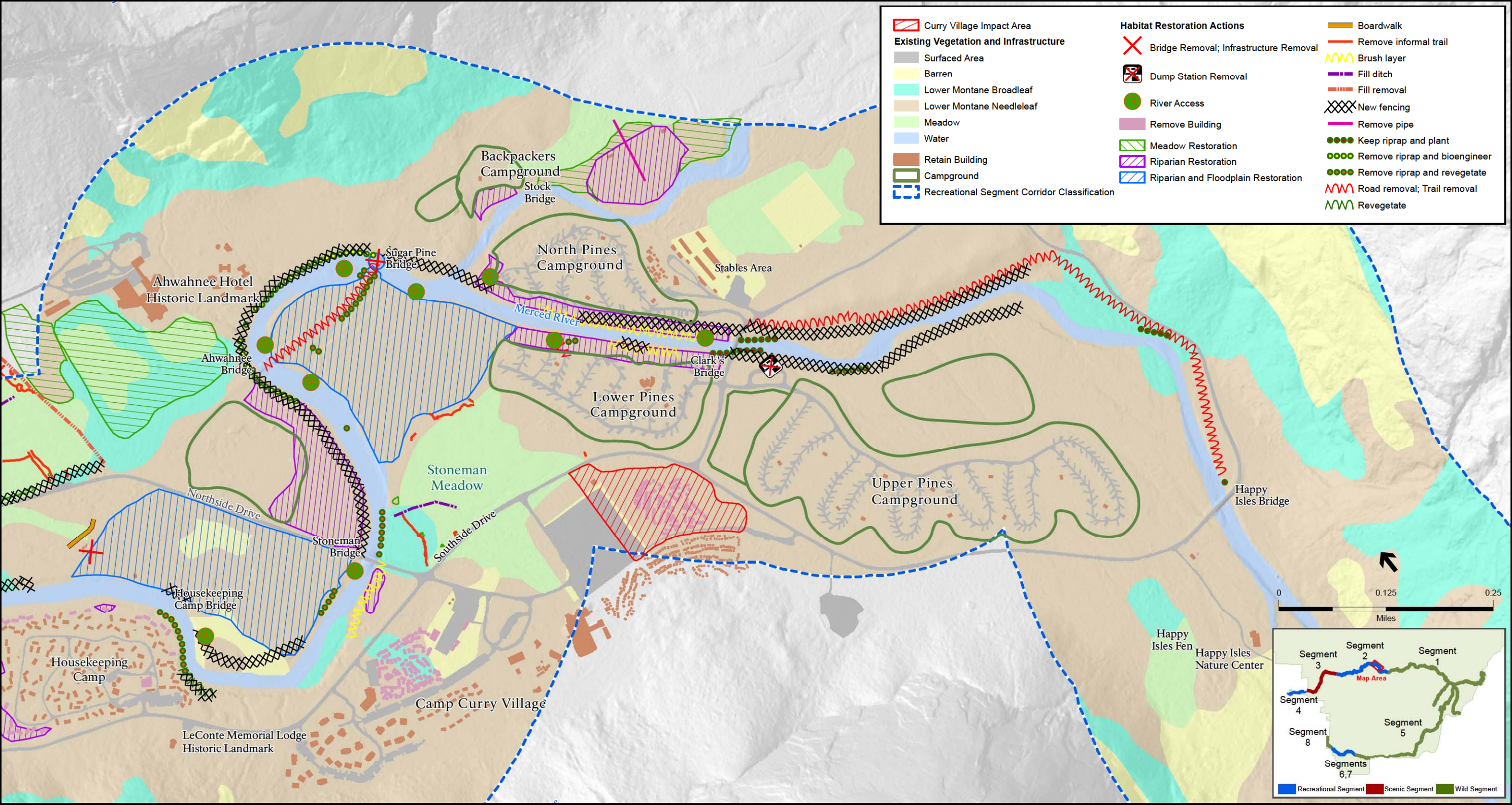
Projects proposed in Segment 2 under Alternative 5 to protect and enhance river values involve constructing a boardwalk for the Valley Loop Trail through sensitive wet meadow habitat in Slaughterhouse Meadow; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; and moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow. Habitat restoration actions in Segment 2 under Alternative 5 are displayed in **figures 9-29 through 9-32**. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-40 and 9-41**. A total of

**TABLE 9-40: SEGMENT 2 VEGETATION RESTORATION UNDER ALTERNATIVE 5<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Intermittently to seasonally flooded meadow	13	Meadow	16	Meadow	18
Semi-permanently to permanently flooded meadow	3				
Sparsely vegetated undifferentiated	2	Sparsely vegetated	2		
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	15	Lower montane broadleaf	15
California black oak forest alliance	6				
California black oak /(bracken fern) forest mapping unit	8				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1	Lower montane needleleaf	65	A mosaic of meadow, black oak, and open canopy coniferous forest	65
Ponderosa pine woodland alliance	1				
Ponderosa pine-incense cedar forest alliance	20				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	43				
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	44
Ponderosa pine-incense cedar forest alliance	19	Lower montane needleleaf	41		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	22				
Urban/Developed	2	Barren	2		
Urban/Developed	4	Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	40
Ponderosa pine-incense cedar forest alliance	22	Lower montane needleleaf	36		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	14				
Total	182		182		182

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

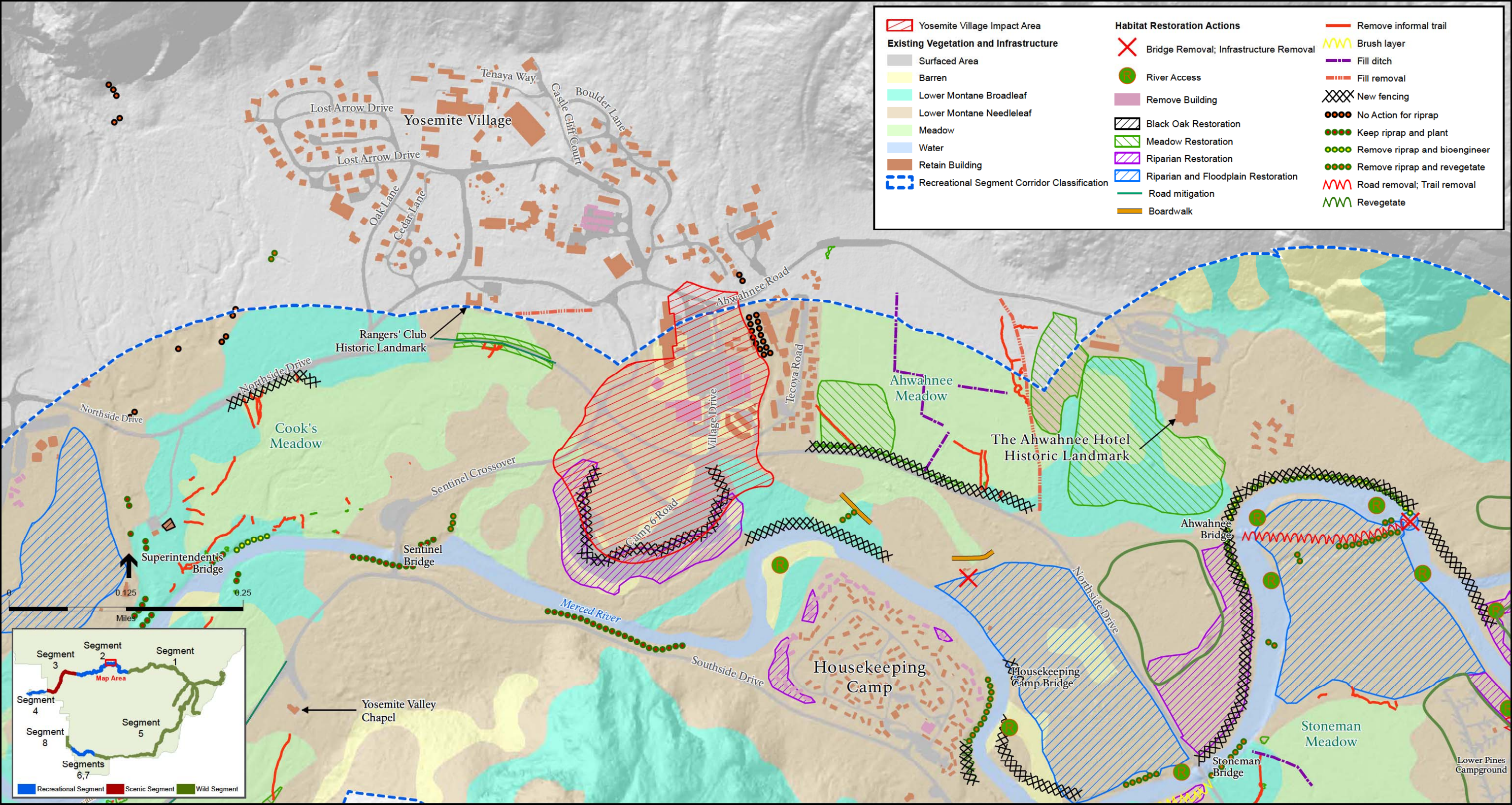




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-29**  
Curry Village Area: Alternative 5 Habitat Restoration Actions  
and Select Facilities Actions

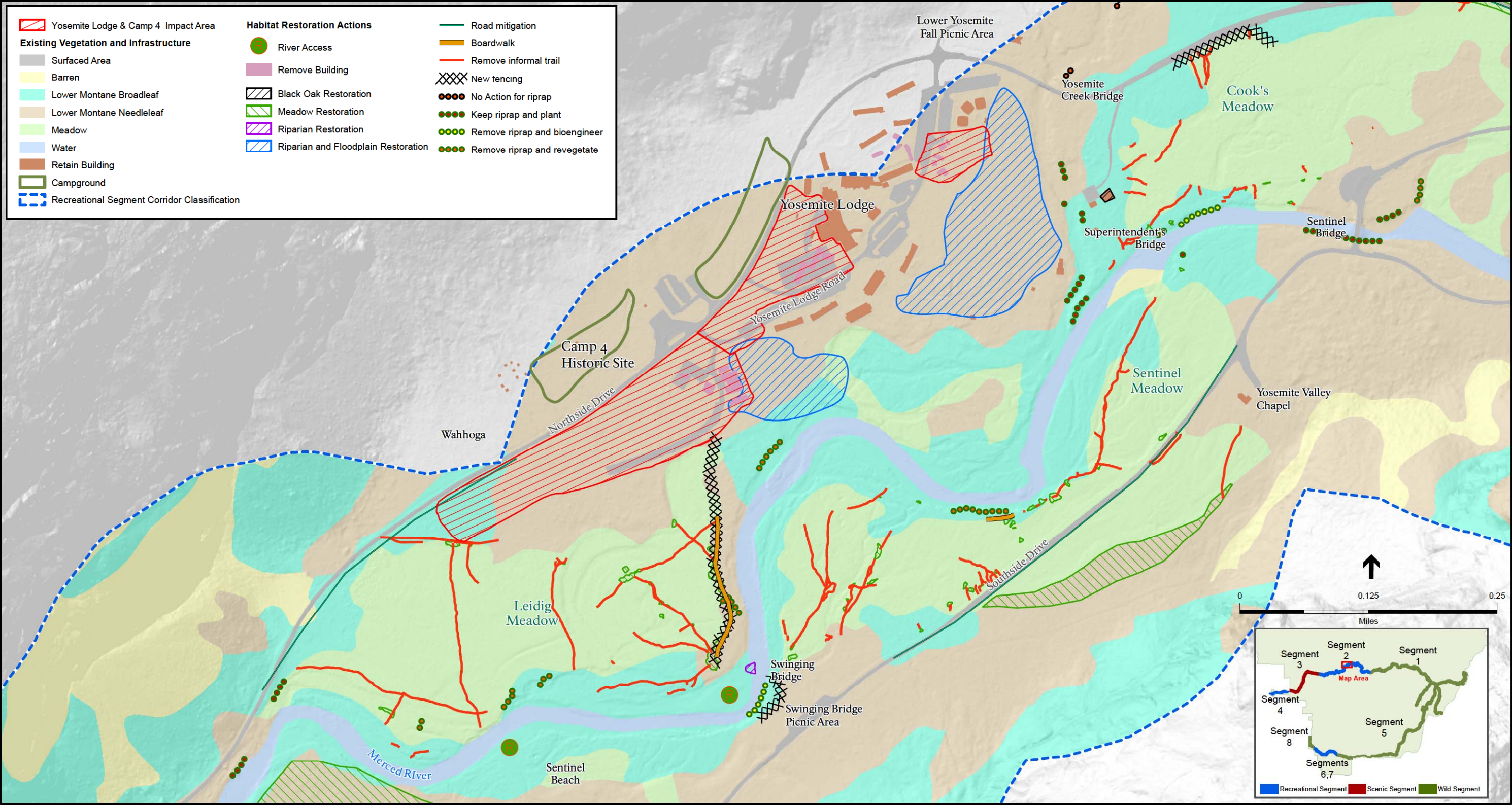




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-30**  
Yosemite Village Area: Alternative 5 Habitat Restoration Actions  
and Select Facilities Actions

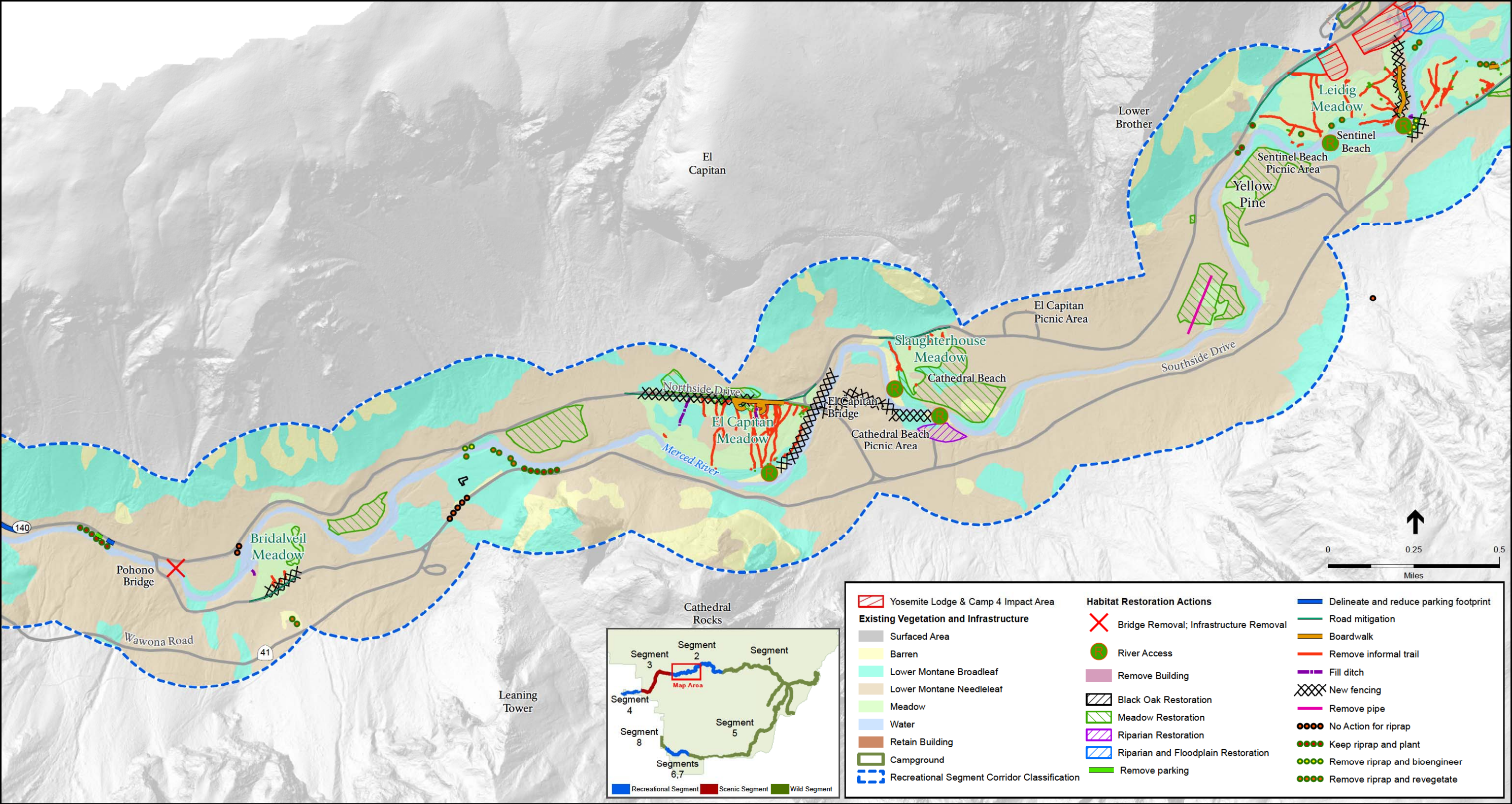




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-31**  
Yosemite Lodge Area: Alternative 5 Habitat Restoration Actions  
and Select Facilities Actions





SOURCE: NPS, 1997, 2011, 2012

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**Figure 9-32**  
West Yosemite Valley: Alternatives 5 Habitat Restoration Actions  
and Select Facilities Actions



**TABLE 9-41: SEGMENT 2 WETLAND RESTORATION UNDER ALTERNATIVE 5**

Wetland Type	Acres
<b>Segment 2</b>	
Palustrine Emergent	16.93
Palustrine Forested	22.30
Palustrine Scrub Shrub	1.14
<b>Total amount of wetlands restored</b>	<b>40.37</b>
SOURCE: NPS 2012c	

182 acres of vegetation would be restored in Segment 2, including 40.37 acres of wetlands (this includes restoration actions common to Alternatives 2-6).

These restoration management actions would improve the hydrologic function and restore the ecological integrity of plant communities and wetlands in the Merced River corridor in Segment 2, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. Removing abandoned underground infrastructure, restoring informal trails, removing conifers from meadows, directing visitor use, removing riprap, and restoring free-flowing conditions along the river corridor would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

#### **Biological Resource Actions.**

**Yosemite Valley Campgrounds:** Specific restoration actions under Alternative 5 to enhance the river’s biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, minor to moderate, beneficial impacts to vegetation and wetlands.

**El Capitan Meadow:** In addition to actions common to Alternatives 2-6 and similar to Alternative 4, Alternative 5 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 5 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on vegetation and wetlands from reduction of trampling from foot traffic that causes habitat fragmentation.

**Ahwahnee Meadow:** Similar to Alternative 4, specific actions under Alternative 5 in Segment 2 to enhance the river’s biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 5. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term,

minor to moderate, beneficial impacts on vegetation and wetlands at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

***Stoneman Meadow:*** Specific actions in Alternative 5 to enhance the biological values of the Merced River include enhancing Stoneman Meadow by redesigning the Orchard Parking Lot to promote water flows and restore drainage from the cliff walls to the meadow. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, beneficial impacts on vegetation and wetlands.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 5 include restoring 35.6 acres of riparian and floodplain habitat at Lower Rivers Campground. While this area is largely undeveloped, Alternative 5 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish former river cut-off channels that have been filled within the restoration area. Large box culverts would be placed under the road to allow water flow, and the riparian zone at former Upper River would be fenced and closed to protect the riverbank from trampling associated with the addition of walk-in campgrounds. Restoration taking place in the Former Upper and Lower Rivers Campground area would result in local, long-term, minor, beneficial impacts on vegetation and wetlands.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 5 include: relocating unimproved Camp 6 parking; removing the Sugar Pine Bridge; placing large wood and constructed logjams along the base of Stoneman Bridge; and improving trail connectivity and routing in the vicinity of the Ahwahnee Bridge. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats, resulting in segmentwide, long-term, moderate beneficial impacts on plant communities and wetlands in Segment 2.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 5, specifically those concerning vehicle access and overnight accommodations, would result in a 5% decrease in daily Yosemite Valley visitation, from approximately 20,900 under Alternative 1 to 19,900. Day use visitation would decrease by 14%. However, due largely to increases in lodging and campground facilities, overnight visitation would increase by about 16%). Under Alternative 5, there would be a net increase in Yosemite Valley lodging

units. This would largely result from the increase in units at Curry Village and removal of units from Housekeeping Camp. The park would increase the total number of campsites within the Valley.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor to moderate, adverse impacts on plant communities in Yosemite Valley.

**Former Upper River Campground Area.** Construction of new walk-in campgrounds and picnic area in undeveloped areas at the former Upper River Campground would preclude the ecological restoration of the former riparian/wetland/California black oak complex in the area. Fencing along the riverbank would mitigate potential additional trampling damage to riparian areas. Construction activities at Upper River Campground would result in direct, temporary and permanent losses of native vegetation as well as the redevelopment of existing developed areas. Outside of previously developed areas, impacts to vegetation would occur in lower montane coniferous forest. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). Losses of vegetation communities, while long-term, would be local, adverse and moderate.

**Curry Village & Campgrounds.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village including the construction of 98 hard-sided units. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct, temporary and permanent losses of native vegetation and wetlands (see **table 9-42**) as well as the redevelopment of existing developed areas. Outside of previously developed areas, impacts to vegetation would occur in lower montane coniferous forest and, to a much lesser extent, meadow. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-42** below, only a small percentage of these vegetation communities would be affected by the facility actions at Curry Village. Impacts to meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, vegetation communities at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-42: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 5**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.03	<0.1 %
Lower Montane Coniferous	6.35	<0.1 %
Redevelopment <sup>b</sup>	1.97	N/A
Wetland (Palustrine Emergent)	0.04	<0.1 %
Wetland (Riverine Intermittent)	0.02	<0.1 %
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Direct impacts to vegetation, including trampling or removal of rooted vegetation, would cause a reduction of total numbers of plants and/or a reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts could also include decrease plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

Vegetation that is removed at Curry Village under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Curry Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands associated with Stoneman Meadow and intermittent channels flowing through the area. Approximately 0.06 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 5. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.



**Camp 6 and Yosemite Village.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area would be formalized to include 850 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. Northside Drive would be re-routed to the south of the Yosemite Village day-use parking area. A pedestrian underpass and a roundabout at the Village Drive/Northside Drive (Camp 6) intersection would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection at Sentinel Drive and the entrance to the parking area would be added to improve traffic flow and alleviate congestion at nearby intersections. Expanded parking area and new road construction activities at Yosemite Village would result in direct temporary and permanent losses of native vegetation and wetlands as well as the redevelopment of existing disturbed areas (see table 9-43).

**TABLE 9-43: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 5**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.28	<0.1%
Lower Montane Coniferous	12.22	0.2%
Lower Montane Broadleaf	0.81	<0.1%
Redevelopment <sup>b</sup>	14.18	N/A
Wetland (Palustrine Emergent)	1.21	0.4%
Wetland (Palustrine Forested)	0.96	0.8%
Wetland (Riverine Intermittent)	0.39	0.3%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

As noted in table 9-43, over half of the area affected by the above actions would occur at sites that are already developed. Outside of previously developed areas, impacts to vegetation would occur almost entirely in lower montane broadleaf forest and lower montane coniferous forest; these types are among the most dominant native vegetation communities in Segment 2. Impacts to meadow habitat would occur in an area currently impacted by its proximity to Sentinel Drive. Losses to these communities would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-43, only a small percentage of these vegetation communities would be impacted by the actions at Camp 6 and Yosemite Village. In addition, potentially affected vegetation communities are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling

and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

Vegetation that would be removed at Camp 6 and Yosemite Village under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Parking areas and new road construction activities at Camp 6 and Yosemite Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands located adjacent to the Northside Drive and Sentinel Crossover intersection, palustrine forested wetlands associated with the Merced River, and intermittent channels flowing through the area. Approximately 2.56 acres of potential jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 5. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, moderate and adverse.

**Yosemite Lodge and Camp 4.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of native vegetation and wetlands as well as the redevelopment of existing disturbed areas (see **table 9-44**). Impacts to vegetation would occur in lower montane coniferous forest, the dominant natural vegetation community in Segment 2, and to a much lesser extent in lower montane broadleaf forest. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-44**, only a small percentage of these vegetation communities would be impacted. In addition, potentially affected vegetation is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

**TABLE 9-44: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 5**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Lower Montane Coniferous	15.47	0.2%
Lower Montane Broadleaf	1.73	<0.1%
Redevelopment <sup>b</sup>	3.69	N/A
Wetland (Palustrine Emergent)	0.01	<0.1%
Wetland (Riverine Intermittent)	0.03	<0.1%
Wetland (Riverine Perennial)	0.01	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like other development actions proposed under this alternative, vegetation that would be removed at Yosemite Lodge under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Yosemite Lodge and Camp 4 would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands and along the Merced River and in intermittent channels flowing through the area. Approximately 0.05 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 5. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

In summary, as shown in **table 9-45**, actions to manage visitor use and facilities would result in the loss of 36.89 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the permanent loss of 2.67 acres of potentially jurisdictional wetlands.

**TABLE 9-45: SUMMARY OF VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 5**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.31	<0.1%
Lower Montane Coniferous	34.04	0.5%
Lower Montane Broadleaf	2.54	<0.1%
Redevelopment <sup>b</sup>	19.84	N/A
Wetland	2.67	0.5%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 5 would result in the restoration of 182 acres of vegetation and 40.37 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in the loss of 36.89 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the permanent loss of 2.67 acres of potentially jurisdictional wetlands.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Currently, vehicles park under the dripline of the 38 valley oak trees. This practice compacts soil under the trees, affecting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 5, valley oaks in El Portal would be enhanced by creating an oak recruitment area of one acre in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in El Portal.

The types of habitat that would be affected by these restoration actions in Segment 4, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-46** and **9-47**. A total of 12 acres of vegetation would be enhanced or restored in Segment 4, including 0.05 acre of wetland (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-46: SEGMENT 4 VEGETATION RESTORATION UNDER ALTERNATIVE 5<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Valley oak woodland alliance	1	Foothill broadleaf woodland	1	Valley oak woodland	1
canyon live oak-(Ponderosa pine-incense cedar) forest superassociation	11	Lower montane broadleaf	11	Riparian & floodplain	11
<b>Total</b>	<b>12</b>		<b>12</b>		<b>12</b>

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**TABLE 9-47: SEGMENT 4 WETLAND RESTORATION UNDER ALTERNATIVE 5**

Wetland Type	Acres
<b>Segment 4</b>	
Palustrine Emergent	0.001
Palustrine Forested	0.05
<b>Total amount of wetlands restored</b>	<b>0.05</b>
SOURCE: NPS 2012c	

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 5, day parking would be expanded by 200 parking spaces at the Abbieville site; this area would be used primarily for visitor access to Yosemite Valley. NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat; a total of 292 employee parking spaces would be added at these locations. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in the Valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at El Portal, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in El Portal.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 12 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.

### Segments 5, 6, 7, and 8: South Fork Merced River

#### *Impacts of Actions to Protect and Enhance River Values*

The Wawona Golf Course would not be removed under Alternative 5, and therefore effects related to its continued operation would be the same as described for Alternative 1. Actions specifically targeted to protect culturally sensitive areas would also benefit vegetation and wetlands, including the relocation or removal of select campsites and stock campground sites that are within the 100-year floodplain or culturally sensitive areas. The removal of select campsites within the floodplain would result in a local, long-term, minor, beneficial impact on riparian vegetation.

The types of habitat that would be affected by these restoration actions in Segment 7, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-48**. A total of three acres of vegetation would be restored in Segment 7 (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-48: SEGMENT 7 VEGETATION RESTORATION UNDER ALTERNATIVE 5<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Ponderosa pine woodland alliance	1	Lower montane needleleaf	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Ponderosa pine-incense cedar forest alliance	2				
<b>Total</b>	<b>3</b>		<b>3</b>		<b>3</b>
<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.					

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 5 include the relocation of stock use campsites from sensitive resource areas to the Wawona maintenance yard. Overall, this action would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 5, the operations of the Wawona stables would be eliminated and two stock campsites would be relocated to this area from the current Wawona stock camp. Thirteen campsites in the Wawona Campground would be removed from within 100 feet of the Merced River or from cultural sites. The area would be restored. Soils would be decompacted and the area would be replanted with riparian vegetation. This would reduce visitor use in this area, resulting in a decrease of



vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 5 would result in the restoration of three acres of vegetation, resulting in long-term, segmentwide, minor, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Alternative 5 would restore approximately 197 acres of vegetation, including 40.52 acres of wetlands, as a result of actions common to Alternatives 2-6 in conjunction with actions specific to Alternative 5. Actions to manage visitor use and facilities would result in the loss of approximately 36.89 acres of vegetation and the permanent loss of 2.67 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 5.

Past development and human activity in the Merced River corridor have in some cases adversely affected vegetation communities and regional vegetation patterns. Actions associated with Alternative 5 are expected to have corridorwide, long-term, moderate, beneficial impacts on vegetation in the Merced River corridor. Restoration actions associated with Alternative 5 would restore meadow and riparian areas, improve and restore hydrologic function and restore ecological integrity throughout the corridor, remove and restore informal trails, and direct the public onto established trails and river access points. This is part of a comprehensive strategy to reduce existing adverse impacts on meadow, wetland, and riparian vegetation. Existing natural resource management actions, such as removal of nonnative invasive plants, would continue. Adverse effects from these actions would be local, short-term, and minor or negligible. There would be local, long-term, moderate, adverse impacts on native vegetation communities from construction of some facilities. Notable actions the park would implement under Alternative 5 include

- restricting recreational use of rivers and riverbanks to reduce riverbank erosion
- removing, restoring, relocating, or repurposing park facilities to efficiently utilize park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees
- managing total visitors to the park and visitor demands for day parking space, lodging, and camping space
- removing facilities within 100 feet of the Merced River and restoring riverbanks, meadows, and riparian habitat

- enhancing meadow, riparian, and river hydrologic function, complexity, and connectivity
- improving the free flow, complexity, and water quality of the Merced River

Generally, Alternative 5 focuses on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2) by removing many flood-prone facilities that are located within 100 feet of the Merced River; repurposing park facilities to improve efficiency; maintaining existing use levels; and providing adequate lodging, camping, and parking space for visitors and employees. Adverse effects from these actions would be associated with active construction or ecological restoration, and would be local, short-term, and minor or negligible. However, there would be local, long-term, moderate, adverse impacts on vegetation communities from construction of some facilities. In addition, visitor use would remain consistent with current levels, and therefore vegetation would continue to be affected in some areas where use is intense (i.e., Curry Village, east Yosemite Valley). These effects would be most pronounced in areas of high human use, such as Yosemite Valley and Wawona (Segments 2 and 7). In total, the long-term effect of all of these measures would be a corridorwide, moderate, beneficial impact on vegetation communities as habitats are restored and habitat fragmentation is reduced.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on vegetation resources are the same as those listed under the No Action Alternative. Alternative 5 would result in segmentwide, long-term, minor to moderate, beneficial impacts on vegetation communities within the Merced River corridor. These actions focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor. The past, present, and future actions in the region would have varying effects on vegetation and wetlands, with some projects restoring or enhancing vegetation and wetlands, and many others resulting in the loss or decline of vegetation and wetlands. For projects that would result in the loss of wetland features regulated under section 404 of the CWA, losses would be typically compensated at a ratio of 1:1 (no net loss). Compensation typically occurs through creation or enhancement of wetlands either on-site or at a designated mitigation bank. However, even with these protections in place, wetlands may be lost over time through unregulated activities or negatively impacted through nonpoint source pollution, nonnative species, and changes in surface and subsurface hydrology over time.

The actions under Alternative 5 would have long-term, beneficial effects on vegetation and wetlands, including vegetation-related ORVs, within the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region (e.g., introduction and spread of nonnative species, direct displacement of vegetation by structures), the actions under Alternative 5 would have a minimal beneficial effect. Overall, cumulative actions on vegetation and wetlands would result in long-term, minor adverse effects on regional vegetation patterns.

## ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to vegetation would be the same as described for Alternative 3.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect vegetation and wetlands in Segment 1 under Alternative 6. Visitation within Segment 1 would not be expected to change appreciably under Alternative 6; wilderness access quotas would remain as under Alternative 1 (No Action) and modifications to overnight accommodations would be nominal. Under Alternative 6, the Merced Lake High Sierra Camp would remain in operation and continue to host overnight guests and through-hikers during the summer months. The camp's 60 beds (22 units) would remain. The park would not reduce the total number of designated campsites within the Merced River corridor's wilderness.

Total daily use levels for Segment 1 under Alternative 6 are estimated at 380 overnight visitors and approximately 450 day visitors, the same as Alternative 1 (No Action). Collectively, actions to maintain similar kinds and levels of use as current levels would result in continued local, long-term, minor, adverse impacts on vegetation and wetlands within Segment 1.

**Merced Lake High Sierra Camp.** Actions in the Merced Lake High Sierra Camp area proposed under Alternative 6 involve retention of the Merced Lake High Sierra Camp and replacing the flush toilets with composting toilets. Actions to maintain current kinds and levels of use would continue local, long-term, minor, adverse impacts on vegetation and wetlands within Segment 1 through the effects of concentrated human use.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 6 would have local, long-term, minor, adverse impacts on plant communities and wetlands in the river corridor.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 under Alternative 6 to protect and enhance river values in addition to those proposed under actions common to Alternatives 2-6 would construct a boardwalk for the Valley Loop Trail through sensitive wet meadow habitat in Slaughterhouse Meadow; and move 780 feet of the Valley Loop Trail out of Bridalveil Meadow.

Habitat restoration actions in Segment 2 under Alternative 6 are displayed in **figures 9-33 through 9-36**. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **tables 9-49 and 9-50**. A total of 156 acres of vegetation would be restored in Segment 2, including 37.32 acres of wetlands (this includes restoration actions common to Alternatives 2-6).

These restoration management actions would improve the hydrologic function and restore the ecological integrity of plant communities and wetlands in the Merced River corridor in Segment 2, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. Removing abandoned underground infrastructure, restoring informal trails, removing conifers from meadows, directing visitor use, removing riprap, and restoring free-flowing conditions along the river corridor would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

### **Biological Resource Actions.**

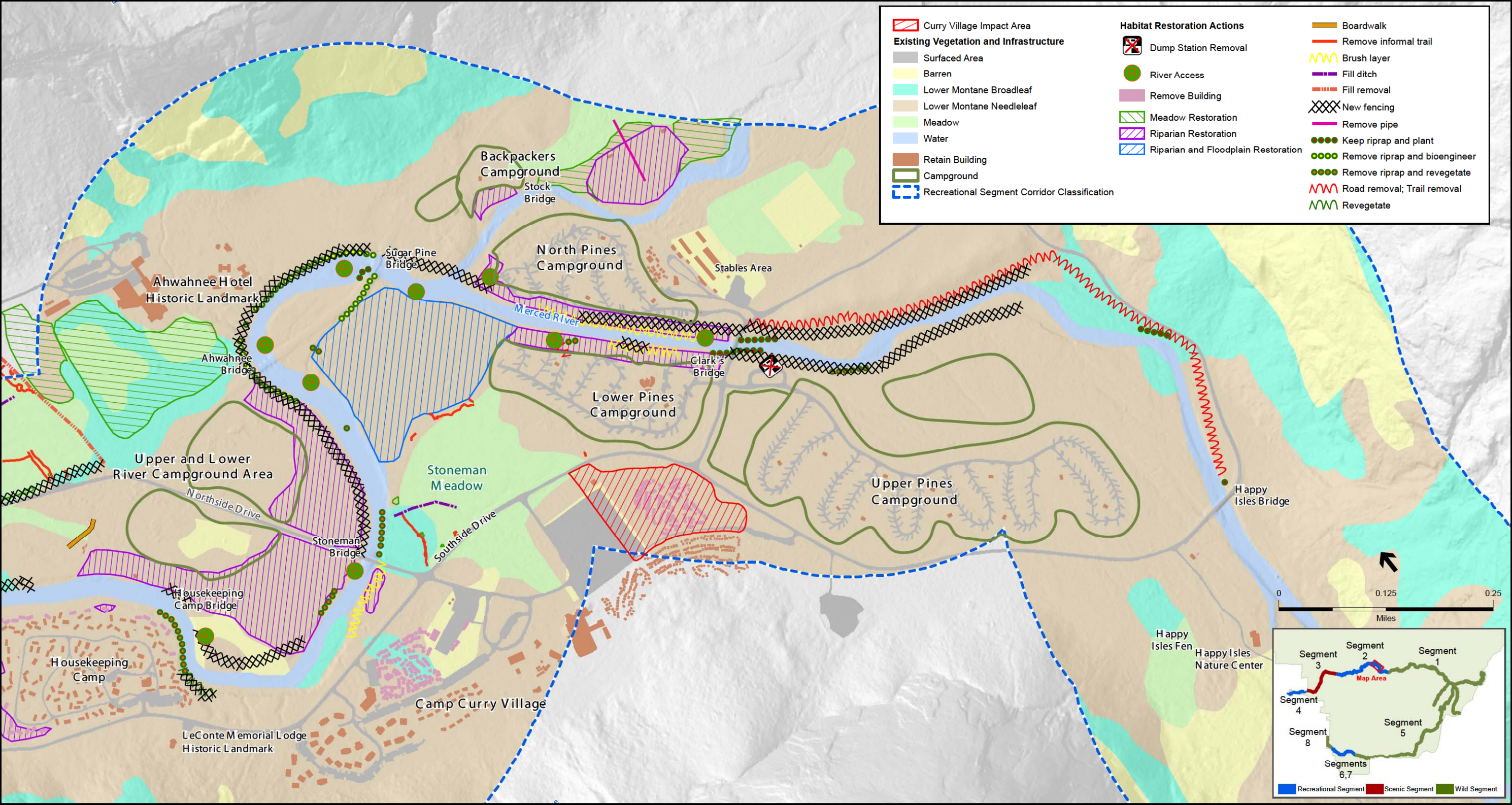
***Yosemite Valley Campgrounds:*** Like Alternative 5, specific restoration actions under Alternative 6 to enhance the river's biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, minor to moderate, beneficial impacts to vegetation and wetlands.

***El Capitan Meadow:*** Alternative 6 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. The NPS would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Additionally, Alternative 6 would selectively remove conifers that block the views of El Capitan from the roadside. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on vegetation and wetlands from reduction of trampling from foot traffic that causes habitat fragmentation.

***Ahwahnee Meadow:*** Similar to Alternatives 4 and 5, specific actions under Alternative 6 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the bike path adjacent to Ahwahnee Meadow would remain under Alternative 6. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, beneficial impacts on vegetation and wetlands at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

***Stoneman Meadow:*** Like Alternative 5, specific actions in Alternative 6 to enhance the biological values of the Merced River include restoring Stoneman Meadow by redesigning the Orchard Parking Lot. Through engineering solutions, Alternative 6 would promote water flow by increasing drainage

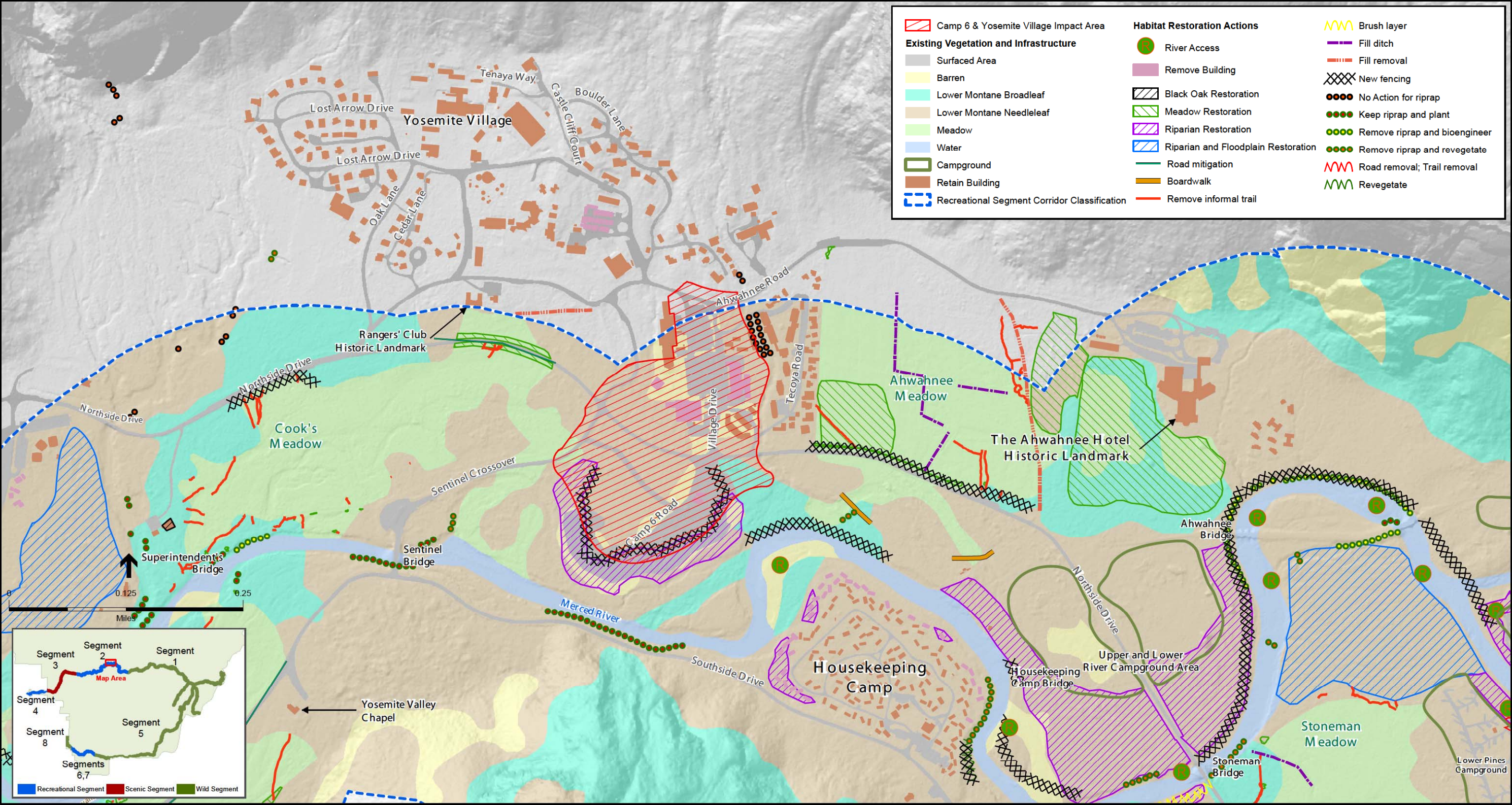




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-33**  
Curry Village Area: Alternative 6 Habitat Restoration Actions  
and Select Facilities Actions





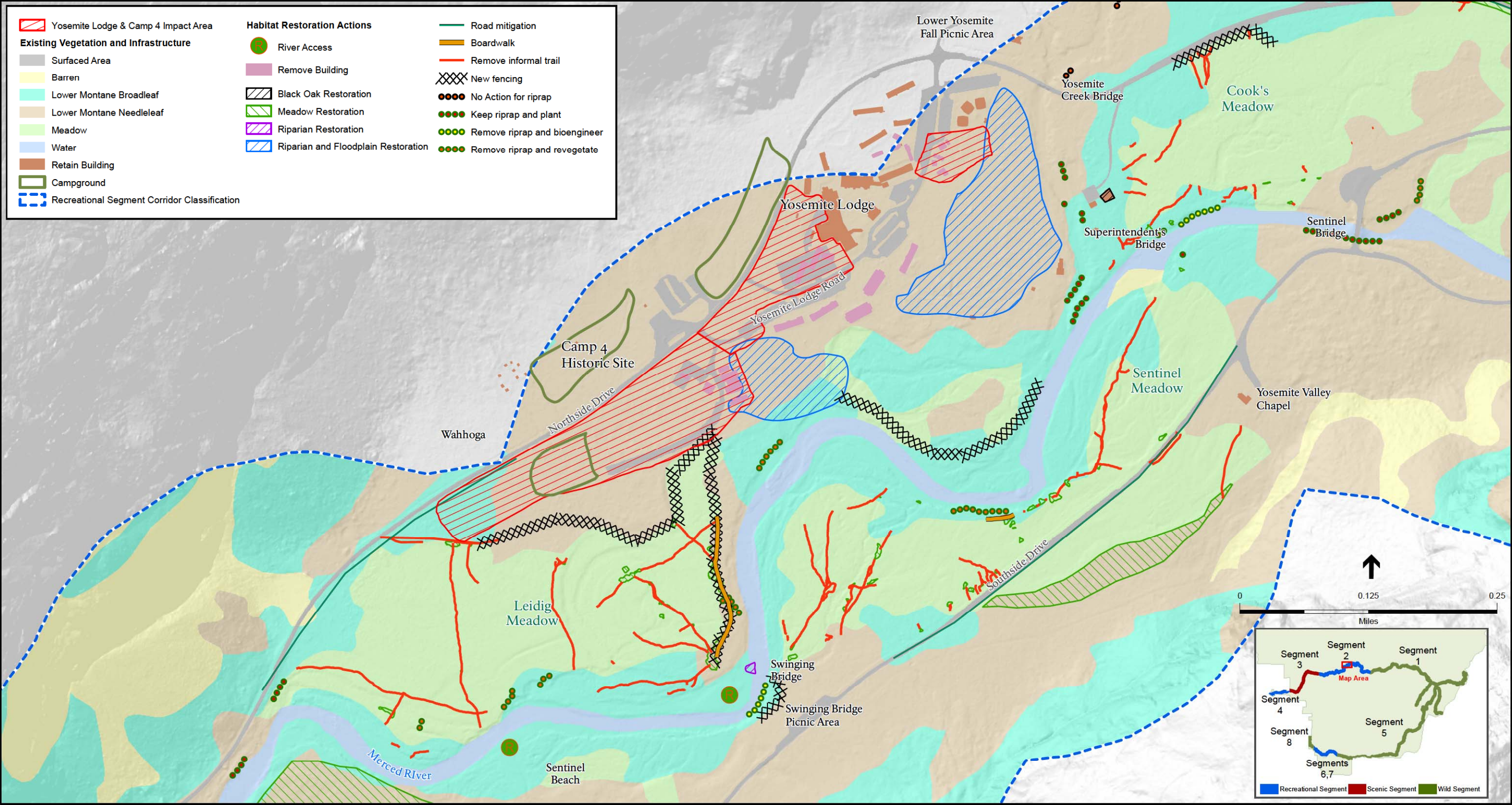
SOURCE: NPS, 1997, 2011, 2012

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-34**

Yosemite Village Area: Alternative 6 Habitat Restoration Actions and Select Facilities Actions

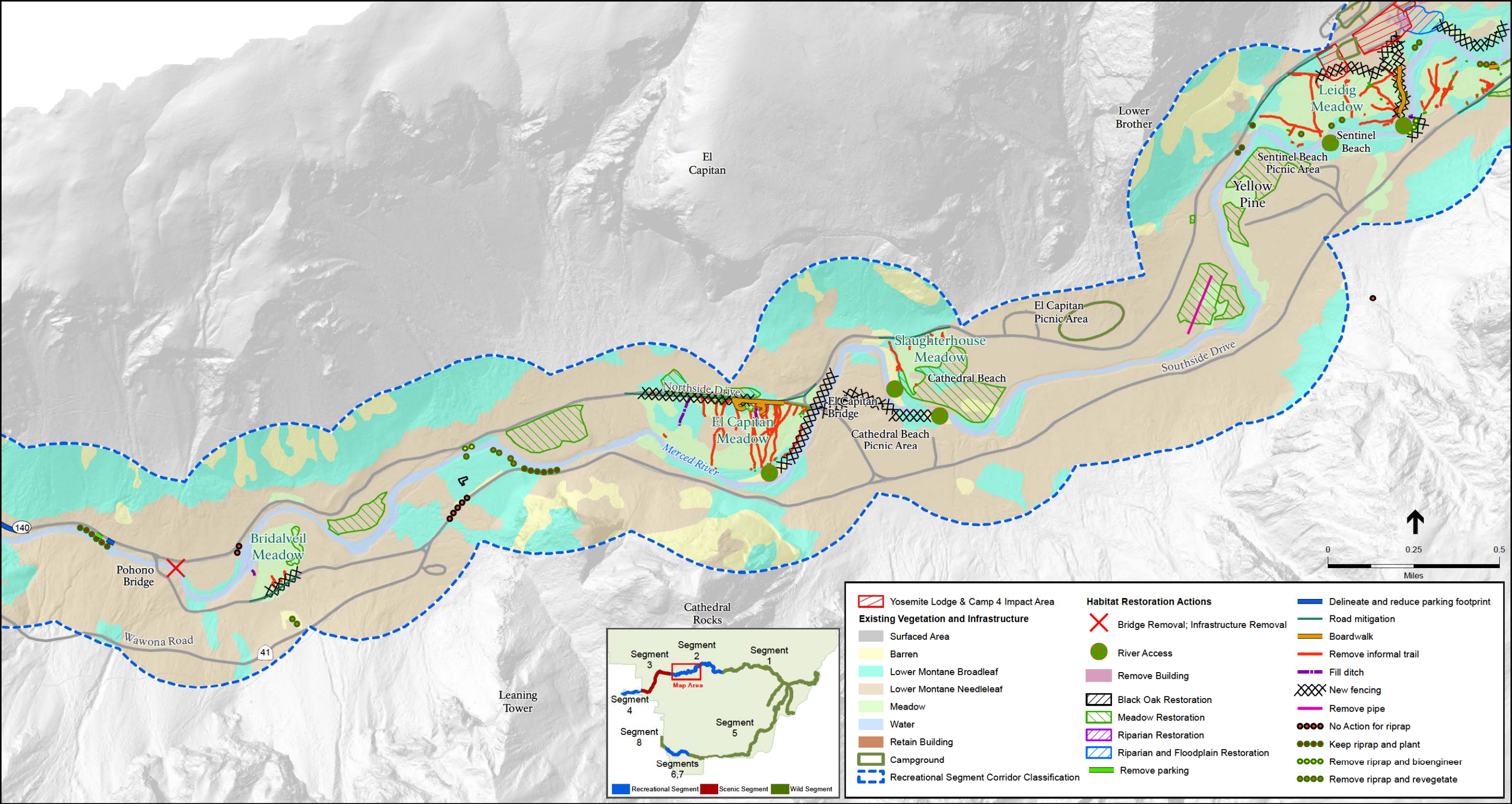




SOURCE: NPS, 1997, 2011, 2012

**Figure 9-35**  
Yosemite Lodge Area: Alternative 6 Habitat Restoration Actions  
and Select Facilities Actions





SOURCE: NPS, 1997, 2011, 2012

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-36**  
West Yosemite Valley: Alternatives 6 Habitat Restoration Actions  
and Select Facilities Actions

**TABLE 9-49: SEGMENT 2 VEGETATION RESTORATION UNDER ALTERNATIVE 6<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Intermittently to seasonally flooded meadow	12	Meadow	16	Meadow	18
Semi-permanently to permanently flooded meadow	3				
Sparsely vegetated undifferentiated	2	Sparsely vegetated	2		
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	15	Lower montane broadleaf	15
California black oak forest alliance	6				
California black oak /(bracken fern) forest mapping unit	8				
Douglas-fir-(White fir-incense cedar-Pondera pine) forest mapping unit	1	Lower montane needleleaf	58	A mosaic of meadow, black oak, and open canopy coniferous forest	58
Ponderosa pine-incense cedar forest alliance	18				
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	39				
Black cottonwood temporarily flooded forest alliance	1	Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	29
Ponderosa pine-incense cedar forest alliance	11	Lower montane needleleaf	28		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	17				
Urban/Developed	4	Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	36
Ponderosa pine-incense cedar forest alliance	20	Lower montane needleleaf	32		
Ponderosa pine-incense cedar-(California black oak-canyon live oak) forest superassociation	12				
Total	156		156		156

<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.

**TABLE 9-50: SEGMENT 2 WETLAND RESTORATION UNDER ALTERNATIVE 6**

Wetland Type	Acres
<b>Segment 2</b>	
Palustrine Emergent	17.13
Palustrine Forested	19.46
Palustrine Scrub Shrub	0.73
<b>Total amount of wetlands restored</b>	<b>37.32</b>
SOURCE: NPS 2012c	



from the cliff walls of the parking lot to Stoneman Meadows, thus improving meadow health. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, beneficial impacts on vegetation and wetlands.

**Former Upper and Lower Rivers Campgrounds:** Like Alternative 5, specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 6 include restoring the topography of 16.5 acres of the floodplain within 150 feet of the ordinary high-water mark of the Merced River. While this area is largely undeveloped, Alternative 6 would remove remaining asphalt; decompact soils in former roadbeds and campsites; re-establish former river cut-off channels and remove imported fill; and place large box culverts under the road to allow water flow. To protect the riverbank from trampling associated with the addition of walk-in campgrounds, the riparian zone at the former Upper River Campground site would be fenced and closed. Restoration of the riverside area at Former Upper and Lower Rivers Campgrounds would result in local, long-term, minor, beneficial impacts on vegetation and wetlands.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on plant communities and wetlands in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 6 include relocating unimproved Camp 6 parking and placing large wood and constructed logjams along the bases of Stoneman, Sugar Pine, and Ahwahnee Bridges. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats, resulting in segmentwide, long-term, moderate beneficial impacts on plant communities and wetlands in Segment 2.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 6, specifically those concerning vehicle access and overnight accommodations, would result in a 4% increase in daily Yosemite Valley visitation, from approximately 20,900 under Alternative 1 to 21,800. Day use would decrease by 7%. However, due largely to increases in lodging and campground facilities, overnight visitation would increase by about 33%. Under Alternative 6, there would be a net increase in Yosemite Valley lodging units. This would largely result from the substantial increase in units at Yosemite Lodge and Curry Village, along with a slight reduction in Housekeeping Camp units. The park would increase the total number of campsites within the Valley.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation, depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition

of facilities along the Merced River. Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor to moderate, adverse impacts on plant communities in Yosemite Valley.

**Former Upper and Lower River Campground Area.** Construction of new walk-in campgrounds and picnic area in undeveloped areas at the former Upper and Lower Campgrounds would preclude the ecological restoration of the former riparian/wetland/California black oak complex in the area. Fencing along the riverbank would mitigate potential additional trampling damage to riparian areas. Construction activities at Upper and Lower River Campground would result in direct, temporary and permanent losses of native vegetation as well as the redevelopment of existing developed areas. Outside of previously developed areas, impacts to vegetation would occur in lower montane coniferous forest. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). Losses of vegetation communities, while long-term, would be local, adverse and moderate.

**Curry Village & Campgrounds.** Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village including the construction of 98 hard-sided units. The units would be constructed within previously developed areas as well as within vegetation communities adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct, temporary and permanent losses of native vegetation and wetlands (see **table 9-51**) as well as the redevelopment of existing developed areas. Outside of previously developed areas, impacts to vegetation would occur in lower montane coniferous forest and, to a lesser extent, meadow. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-51** below, only a small percentage of these vegetation communities would be affected by the facility actions in Curry Village. Impacts to meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, vegetation communities at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

Direct impacts to vegetation, including trampling or removal of rooted vegetation, would cause a reduction of total numbers of plants and/or a reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts could also include decrease plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

**TABLE 9-51: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 6**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.03	<0.1%
Lower Montane Coniferous	6.35	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
Wetland (Palustrine Emergent)	0.04	<0.1%
Wetland (Riverine Intermittent)	0.02	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Vegetation that would be removed at Curry Village under Alternative 6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Construction activities at Curry Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands associated with Stoneman Meadow and intermittent channels flowing through the area. Approximately 0.06 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 6. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

**Camp 6 and Yosemite Village.** Near-term specific project-level actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area would be formalized to include 850 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. A pedestrian underpass and two roundabouts



(one at the Village Drive/Northside Drive intersection and one at the Sentinel Drive/Northside Drive intersection) would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection would be added at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion. Expanded parking area and new road construction activities at Yosemite Village would result in direct temporary and permanent losses of native vegetation and wetlands as well as redevelopment of existing disturbed areas (see table 9-52).

**TABLE 9-52: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 6**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.28	<0.1%
Lower Montane Coniferous	12.22	0.2%
Lower Montane Broadleaf	0.81	<0.1%
Redevelopment <sup>b</sup>	14.18	N/A
Wetland (Palustrine Emergent)	1.21	0.4%
Wetland (Palustrine Forested)	0.96	0.8%
Wetland (Riverine Intermittent)	0.39	0.3%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

As noted in table 9-52, over half of the area affected by the above actions would occur at sites that are already developed. Outside of previously developed areas, impacts to vegetation would occur almost entirely in lower montane broadleaf forest and lower montane coniferous forest; these types are among the most dominant native vegetation communities in Segment 2. Impacts to meadow habitat would occur in an area currently impacted by its proximity to Sentinel Drive. Losses to these communities would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-52, only a small percentage of these vegetation communities would be impacted by the actions at Camp 6 and Yosemite Village. In addition, potentially affected vegetation communities are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

Vegetation that would be removed at Camp 6 and Yosemite Village under Alternative 6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

Parking areas and new road construction activities at Camp 6 and Yosemite Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands located adjacent to the Northside Drive and Sentinel Crossover intersection, palustrine forested wetlands associated with the Merced River, and intermittent channels flowing through the area. Approximately 2.56 acres of potential jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 6. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, moderate and adverse.

**Yosemite Lodge and Camp 4.** Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of native vegetation and wetlands as well as the redevelopment of existing disturbed areas (see **table 9-53**). Impacts to vegetation would occur in lower montane coniferous forest, the dominant natural vegetation community in Segment 2, and to a much lesser extent in lower montane broadleaf forest. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-53**, only a small percentage of these vegetation communities would be impacted. In addition, potentially affected vegetation communities are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses of vegetation communities, while long-term, would be local, adverse and minor.

Like other development actions proposed under this alternative, vegetation that is removed at Yosemite Lodge and Camp 4 under Alternative 6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Yosemite Valley, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce impacts to local, long-term, minor and adverse.

**TABLE 9-53: VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 6**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Lower Montane Coniferous	15.47	0.2%
Lower Montane Broadleaf	1.73	<0.1%
Redevelopment <sup>b</sup>	3.69	N/A
Wetland (Palustrine Emergent)	0.01	<0.1%
Wetland (Riverine Intermittent)	0.03	<0.1%
Wetland (Riverine Perennial)	0.01	<0.1%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Construction activities at Yosemite Lodge and Camp 4 would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands and along the Merced River and in intermittent channels flowing through the area. Approximately 0.05 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the proposed actions under Alternative 6. Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Construction activities may also generate indirect impacts to wetlands including potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime, and increases in sedimentation due to ground disturbance associated with construction. However, post-construction, temporarily impacted areas would be restored. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed mitigation measures MM-HYD-1, MM-VEG-1, and MM-VEG-4 through MM-VEG-7, as applicable (see Appendix C), and avoidance of wetlands during construction where possible, would reduce impacts to wetlands to local, long-term, minor and adverse.

In summary, as shown in **table 9-54**, actions to manage visitor use and facilities would result in the loss of 36.89 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the loss of 2.67 acres of potentially jurisdictional wetlands.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 6 would result in the restoration of 156 acres of vegetation and 37.32 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in the loss of 36.89 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the loss of 2.67 acres of potentially jurisdictional wetlands.

**TABLE 9-54: SUMMARY OF VEGETATION AND WETLAND IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES – ALTERNATIVE 6**

Vegetation/Wetland Type	Acres	Percent of Vegetation/Wetland Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Meadow	0.31	<0.1%
Lower Montane Coniferous	34.04	0.5%
Lower Montane Broadleaf	2.54	<0.1%
Redevelopment <sup>b</sup>	19.84	N/A
Wetland	2.67	0.5%
<sup>a</sup> This is a comparison of the acres of vegetation/wetland impacted to the total acres of that vegetation/wetland type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Currently, vehicles park under the dripline of the 38 valley oak trees. This practice compacts soil under the trees, affecting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 6, valley oaks in El Portal would be enhanced by creating an oak recruitment area of one acre in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in El Portal.

The types of habitat that would be affected by restoration actions in Segment 4, as well as the types of habitat that would be enhanced or restored, are summarized in tables 9-55 and 9-56. A total of 12 acres of vegetation would be restored in Segment 4, including 0.05 acre of wetland (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-55: SEGMENT 4 VEGETATION RESTORATION UNDER ALTERNATIVE 6<sup>a</sup>**

Current Vegetation	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Valley oak woodland alliance	1	Foothill broadleaf	1	Valley oak woodland	1
canyon live oak-(Ponderosa pine-incense cedar) forest superassociation	11	Lower montane broadleaf	11	Lower montane broadleaf	11
<b>Total</b>	<b>12</b>		<b>12</b>		<b>12</b>
<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.					

**TABLE 9-56: SEGMENT 4 WETLAND RESTORATION UNDER ALTERNATIVE 6**

Wetland Type	Acres
<b>Segment 4</b>	
Palustrine Emergent	0.001
Palustrine Forested	0.05
<b>Total amount of wetlands restored</b>	<b>0.05</b>
SOURCE: NPS 2012c	

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 6, day parking would be expanded by 200 parking spaces at the Abbieville site; this area would primarily be used for visitor access to Yosemite Valley. NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in the Valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Relocation of facilities to other locations within the corridor could have long-term, negligible to moderate, adverse effects on vegetation depending on site-specific conditions and project design. Local, minor to moderate, short-term, adverse effects could occur from construction and demolition of facilities along the Merced River. Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at El Portal, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Wetlands would be avoided during construction activities. Adherence to proposed mitigation measures MM-GEO-1, MM-HYD-1, and MM-VEG-1 through MM-VEG-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on plant communities in El Portal.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 12 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### *Impacts of Actions to Protect and Enhance River Values*

The Wawona Golf Course would not be removed under Alternative 6, and therefore effects related to its continued operation would be the same as described for Alternative 1. Actions specifically targeted to protect culturally sensitive areas would benefit vegetation and wetlands as well, including the

relocation or removal of select campsites and stock campground sites that are within 100 feet of the river or in culturally sensitive areas. The removal of select camp sites within the floodplain would result in local, long-term, minor, beneficial impact on vegetation and wetlands.

The types of habitat that would be affected by these restoration actions in Segment 7, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-57**. A total of three acres of vegetation would be restored in Segment 7 (this includes restoration actions common to Alternatives 2-6).

**TABLE 9-57: SEGMENT 7 VEGETATION RESTORATION UNDER ALTERNATIVE 6<sup>a</sup>**

Current Vegetation and Acreage	Acres	Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Ponderosa pine woodland alliance	1	Lower montane needleleaf	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Ponderosa pine-incense cedar forest alliance	2				
<b>Total</b>	<b>3</b>		<b>3</b>		<b>3</b>
<sup>a</sup> Left four columns are the existing vegetation and general vegetation type and corresponding acres of each. Right two columns are the habitat type and acreage that the proposed restoration would restore or enhance.					

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 6 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 6, the operations of the Wawona stables would be eliminated and two stock campsites would be relocated to this area from the current Wawona stock camp. Thirteen campsites in the Wawona Campground would be removed from within 100 feet of the river or from cultural sites. The area would be restored. Soils would be decompacted and the area would be replanted with riparian vegetation. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. Overall, these actions would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 6 would result in the restoration of three acres of vegetation, resulting in long-term, segmentwide, minor, beneficial impacts on vegetation and wetlands. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.



## **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Alternative 6 would restore approximately 170 acres of vegetation, including 37.37 acres of wetlands, as a result of actions common to Alternatives 2-6 and those specific to Alternative 6. Actions to manage visitor use and facilities would result in the loss of approximately 36.89 acres of vegetation and the permanent loss of 2.67 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 6. Past development and human activity in the Merced River corridor have in some cases adversely affected vegetation communities and regional vegetation patterns. Actions associated with Alternative 6 are expected to have corridorwide, long-term, moderate, beneficial impacts on vegetation in the Merced River corridor. As described above, many of the actions in Alternative 6 would address existing adverse impacts on vegetation communities. This includes actions that are targeted to improve wetland, riparian, and meadow communities where these habitats are near or adjacent to existing developments and areas subject to high visitor use. Additionally, the park would implement measures to increase channel free flow, improve water quality, and reduce erosion and scouring. Notable actions the park would implement under Alternative 6 include

- restricting recreational use of rivers and riverbanks to reduce riverbank erosion
- removing, restoring, relocating, or repurposing park facilities to efficiently utilize park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees
- managing for an increase (4%) in total daily visitors to the park and visitor demands for day parking space, lodging, and camping space
- removing selected facilities within 100 feet of the Merced River and restoring riverbanks, meadows, and riparian habitat
- enhancing meadow, riparian, and river hydrologic function, complexity, and connectivity
- improving the free flow, complexity, and water quality of the Merced River

Generally, Alternative 6 is focused on restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2); retaining most park facilities but removing selected facilities that are located within 100 feet of the Merced River and are jeopardized by flood; repurposing park facilities to improve efficiency of use; and providing adequate lodging, camping, and parking space for visitors and employees. Additionally, the park would continue to provide river access to visitors in designated areas, and continue to protect the river and riverbanks by requiring permits or limiting use of put-in areas. Alternative 6 would allow for a significant increase in total daily visitations to the park and park infrastructure (lodging, camping space, and parking lots) would be retained or expanded in selected locations to accommodate increased demand. Adverse effects from these actions would be associated with the active construction or restoration phase, and would be local, short-term, and negligible to moderate, depending on the type of project and location. Although some habitat would be restored and fragmentation would be reduced in selected areas, increase in visitors to the park accompanied by continued operation of most park facilities and construction of new facilities would result in adverse impacts on vegetation communities over the long-term where visitor use is concentrated. These effects would be most prominent in areas of high human use, such as Yosemite Valley and Wawona

(Segments 2 and 7). When combined, the long term effect of Alternative 6 would be a corridorwide, moderate beneficial impact on vegetation.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on vegetation resources are the same as those listed under the No Action Alternative. Alternative 6 would result in segmentwide, long-term, minor, beneficial impacts on vegetation communities within the Merced River corridor. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor. The past, present, and future actions in the region would have varying effects on vegetation and wetlands, with some projects restoring or enhancing vegetation and wetlands, and many others resulting in the loss or decline of vegetation and wetlands. For projects that would result in the loss of wetland features regulated under section 404 of the CWA, losses would be typically compensated at a ratio of 1:1 (no net loss). Compensation typically occurs through creation or enhancement of wetlands either on-site or at a designated mitigation bank. However, even with these protections in place, wetlands may be lost over time through unregulated activities or negatively impacted through nonpoint source pollution, nonnative species, and changes in surface and subsurface hydrology over time.

The actions under Alternative 6 would have long-term, beneficial effects on vegetation and wetlands, including vegetation-related ORVs, within the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region (e.g., introduction and spread of nonnative species, direct displacement of vegetation by structures), the actions under Alternative 6 would have a minimal beneficial effect. Overall, cumulative actions on vegetation and wetlands would result in long-term, minor, adverse effects on regional vegetation patterns.

## Wildlife

### *Affected Environment*

#### Regulations and Policies Pertaining to Wildlife

Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), issued in January 2001, restated the value of migratory birds and directed agencies to develop and implement memoranda of understanding with the U.S. Fish and Wildlife Service (USFWS) to protect them. The National Park Service (NPS) memorandum of understanding requires park units to restore and enhance migratory bird habitat and support conservation of migratory birds. Under the Migratory Bird Treaty Act of 1918, it is unlawful to kill, capture, buy, sell, import, or export migratory birds, eggs, feathers, or other parts. Additionally, under 36 *Code of Federal Regulations* (CFR) 2.2, the following wildlife protection measures are prohibited: the taking of wildlife; the feeding, touching, teasing, frightening, or intentional disturbing of wildlife nesting, breeding, or other activities; and possessing unlawfully taken wildlife or portions thereof.

Executive Order 13112 (“Invasive Species”), issued in February 1999, established the National Invasive Species Council. The Executive Order requires the creation of a Council of Departments to provide consultation to federal agencies in matters related to invasive species. Federal agencies whose actions may affect the status of invasive species are required to identify such actions, use relevant programs and authorities to prevent the introduction of invasive species; detect, respond, control, and monitor populations of such species; and provide for restoration of native species and habitats that were invaded. Additionally, federal agencies are not authorized to fund or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere, unless the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize the risk of harm would be taken in conjunction with the actions. Federal agencies shall carry out actions that would potentially affect the status of invasive species in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan, and in cooperation with stakeholders, as appropriate.

Additional Federal and state laws and regulations to protect special status wildlife include:

- *Endangered Species Act (ESA)*
- *Migratory Bird Treaty Act*
- *Bald Eagle and Golden Eagle Protection Act*
- *Fish and Wildlife Coordination Act of 1934* (as amended)
- National Park Service Regulations and Policies (*NPS Organic Act of 1916*, *NPS Management Policies 2006* (NPS 2006), and *NPS Natural Resource Management Reference Manual 77*)
- North American Wildlife Conservation Model

- *California Endangered Species Act*
- *California Fish and Game Code* (for the protection of birds)

Refer to the *Regulations and Policies Pertaining to Special Status Species* in the Special Status Species Section for a discussion of federal and state laws and regulations pertaining to wildlife that are legally protected or designated “rare” under the Federal Endangered Species Act of 1973, California Endangered Species Act, or other regulations.

### **Yosemite National Park Regional Wildlife**

Yosemite National Park, which is one of the largest and least-fragmented habitat blocks in the Sierra Nevada range, supports a diverse and abundant assemblage of wildlife. Its importance in protecting the long-term survival of certain species and the overall biodiversity of wildlife in the Sierra Nevada region was recognized in the reports prepared as part of the Sierra Nevada Ecosystem Project (UC Davis 1996). The Sierra Nevada Ecosystem Project included assessments of the Sierra Nevada headwaters of 23 major river basins in addition to the Merced River, from Eagle Lake in the north to the Mojave River in the south. As part of these assessments, much of the main stem of the Merced River corridor and the South Fork Merced River corridor were identified as an aquatic diversity management area (UC Davis 1996).

The Merced River corridor also plays an essential ecological role in linking wildlife habitats across the park’s landscape and gradients of elevation; it represents a critical migration corridor for many wildlife species. This fact forms an important part of the framework for this analysis. For wildlife populations to be viable, resources and environmental conditions must be sufficient for foraging, resting, cover, and dispersal of animals. Patterns, types, and amounts of resources must be sufficient for the needs of reproductive individuals on daily, seasonal, and yearly scales. Habitat must also be well-distributed over a broad geographic area to allow breeding individuals to interact spatially within and among populations, and a stable, relatively undisturbed riparian corridor supplies a mechanism for this kind of ecological connection.

### **Mammals**

Approximately 85 native mammal species in 6 families inhabit Yosemite. There are 17 species of bats, 5 of which are either state or federal species of special concern (see the “Special Status Species” section of this chapter). Ungulates in the park include mule deer (*Odocoileus hemionus*) and the federal and state endangered Sierra Nevada bighorn sheep (*Ovis canadensis*). Bighorn sheep historically populated the Sierra Nevada crest and the Cathedral Range in Yosemite. It is highly unlikely that they currently occupy the Merced River corridor watershed (NPS 2011a), although some rams may occasionally enter the Merced River corridor. Bighorn sheep critical habitat, as (designated in 2008 by the USFWS, does not occur within the Merced River corridor. Currently, a recovery unit of approximately 40 animals is located at high elevations in the northeastern section of Yosemite and the adjacent Inyo National Forest. Growth of this population is critical for the species to reoccupy their former range in the park. Carnivores include black bears (*Ursus americanus*), bobcats (*Lynx rufus*), coyotes (*Canis latrans*), raccoons (*Procyon lotor*), mountain lions (*Puma concolor*), ringtails (*Bassariscus astutus*), weasels (*Mustela frenata*), and gray foxes (*Urocyon cinereoargenteus*). Yosemite’s largest mammal, the

grizzly bear (*Ursus arctos horribilis*), was extirpated from the region and from the state in the 1920s. Other mammal species that survive but are extremely rare are the fisher (*Martes pennanti*), wolverine (*Gulo gulo*) (possibly extirpated from the region), and Sierra Nevada red fox (*Vulpes vulpes necator*). A recent study (Espinoza et al. 2011) of habitat adjacent to the Merced River in Yosemite Valley predicted a total of 68 mammal species are expected to occur in this segment of the Merced River corridor.

### **Birds**

Yosemite's wide range of elevations and habitats support a diversity of bird species. The 2011 study (Espinoza et al. 2011) on wildlife conditions within the Merced River corridor in Yosemite Valley predicted 218 bird species are expected to occur in Segment 2 of the Merced River corridor. Several bird species likely to have been reduced in Yosemite Valley by centuries of human activity are present in less disturbed areas. For example, Valley meadows are suitable habitat for great gray owls (*Strix nebulosa*), and the species persists in other meadows, although sightings in the Valley are very rare. Willow flycatchers (*Empidonax tarillii*) no longer nest in the park, including Yosemite Valley; the most recent observations within the Merced River corridor occurred in the 1970s (NPS 2011a). The spread of cowbirds into the Sierra Nevada has been associated with human disturbance and activities; brown-headed cowbirds (*Molothrus ater*) are common in Yosemite and can be found in large numbers at the park's stables and corrals, campgrounds, and residential areas (NPS 2011). Cowbirds are considered "nest parasites" that lay eggs in the nests of other bird species, thus adversely affecting their reproduction.

On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including in Yosemite. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes. Although the population declines result from decades of development, since the 1980s, park management has focused on reducing or reversing habitat effects associated with fire suppression, pesticide use, and other factors on park lands (Cardno ENTRIX 2011).

### **Fish**

Most fish currently found in the Merced River and its tributaries in Yosemite have been introduced. Prior to trout-stocking for sport fishing, native fish in Yosemite were probably limited primarily to rainbow trout (*Oncorhynchus mykiss*) and the Sacramento sucker (*Catostomus occidentalis*), both of which are present only in the lower portions (i.e., Yosemite Valley and below) of the Merced River (Stillwater Sciences 2008). A series of glaciations eliminated all fish from the high country, and waterfalls remaining on all rivers after the glaciers retreated prevented repopulation by upstream migration. Fish native to the Merced River in El Portal and downstream include Sacramento pikeminnow (*Ptychocheilus grandis*), hardhead (*Mylopharodon conocephalus*), California roach (*Lavinia symmetricus*), and riffle sculpin (*Cottus gulosus*).

Although the upper watershed of the Merced River was stocked with a variety of nonnative trout until 1991, Yosemite streams are subject to tremendous fluctuations in flow; these fluctuations, combined

with severe climatic conditions, low nutrient availability associated with snowmelt over granitic watersheds, and lack of spawning habitat, have restricted natural sustainability of introduced fish in a majority of Yosemite's lakes. Fishery surveys conducted in the mid-1970s found 62 lakes with self-supporting fish populations and 195 lakes that supported little or no natural reproduction (NPS 1977). A more recent survey of lakes, ponds, marshes, and wet meadows was conducted in Yosemite from 2000 to 2002 (Knapp 2003). This survey found fish present in 245 of 2,655 bodies of water. These tended to be large, deep, lakes.

As discussed in the "Hydrology, Floodplains, and Water Quality" section of this chapter, until recently, trees that fell into the Merced River in nonwilderness areas were considered hazardous to bridges and humans and removed. This practice deprived fish and other aquatic organisms of important habitat and has altered natural river dynamics. Roads, ditches, utilities, and other structures in meadows have likely altered meadow hydrology, thus affecting water and nutrient flows into aquatic ecosystems. Fallen trees are now allowed to remain in most stretches of the river because of their value to aquatic and riparian ecosystems.

### ***Reptiles and Amphibians***

Compared to most mountain regions of the west, Yosemite has a particularly large number of native reptile and amphibian species: 14 snakes (one poisonous), 7 lizards, 1 turtle, 2 toads, 1 tree frog, 3 true frogs (1 extirpated, 1 nonnative, and 1 native), and 5 salamanders (including newt and ensatina). The 2011 study (Espinoza et al. 2011) on wildlife conditions within the Merced River corridor in Yosemite Valley predicted 10 amphibian species and 21 reptile species are expected to occur in Segment 2 of the Merced River corridor.

Amphibians in Yosemite have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellers 1996, Knapp 2003). These declines were first noticed in the 1970s but likely began much earlier with the introduction of nonnative fish into park watersheds. Foothill yellow-legged frogs (*Rana boylei*) likely were found in Yosemite Valley in the past but are now apparently extinct in the Valley (NPS 2011a). Significant factors in their disappearance probably include reduction in perennial ponds and wetlands and predation by bullfrogs (*Rana catesbeiana*). The fast-growing bullfrog tadpoles often out-compete native amphibians, while the large adult bullfrogs are generalist predators that consume a broad diversity of native species, including native amphibians (frogs, toads, salamanders), small mammals (including bats), reptiles (snakes and turtles), and birds.

At higher elevations, Sierra Nevada yellow-legged frogs (*Rana sierrae*) (previously named mountain yellow-legged frog) and Yosemite toads (*Anaxyrus canorus*) are still present in a number of areas but are severely reduced in population and range. During the 2000 to 2002 survey of lakes, ponds, marshes, and wet meadows in Yosemite, Sierra Nevada yellow-legged frogs were found in 282 of 2,655 bodies of water surveyed, and Yosemite toads were found in 74 of 2,655 bodies of water surveyed (Knapp, 2003). Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada; Espinoza et al. (2011a) did not detect foothill yellow-legged frogs during their survey efforts, nor has this species been detected in the valley since the late 1970s. The suitability of habitat for this species in Yosemite Valley is considered low because their distribution generally occurs at lower elevations at this latitude (Behler and King 2002, Lannoo 2005). In the status review of the Sierra Nevada yellow-legged



frog, the California Department of Fish and Game (CDFG) concluded that the introduction of nonnative fishes and the infectious disease chytridiomycosis caused by the amphibian chytrid fungus are the principal drivers of decline in this species. Research continues to identify the causes of amphibian declines in the Sierra Nevada; for Yosemite toads and foothill yellow-legged frogs, possible causes of decline include habitat loss, nonnative aquatic species (bullfrogs and fish), pesticides, and diseases.

### *Nonnative Wildlife Species*

As with vegetation, the introduction of nonnative species has had significant adverse effects on native wildlife species in Yosemite National Park. Nonnative wildlife includes white-tailed ptarmigan (*Lagopus leucura*), wild turkey (*Meleagris gallopavo*), brown-headed cowbird, European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), cutthroat trout (*Oncorhynchus clarkii*), and bullfrog. Feral pigs (*Sus scrofa domesticus*) are regularly observed near the park and could potentially increase their range into the park's lower elevations, especially with climate change.

Introductions of fishes into the Merced River drainage of Yosemite probably began in the late 1800s with transfers of Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), coastal rainbow trout (*Oncorhynchus mykiss irideus*), and California golden trout (*Oncorhynchus aguabonita*) from nearby waters. Rainbow trout is the only trout species native to the Merced River; rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or have displaced, the original strain. Other species of trout not native to California, including brook trout, brown trout, and arctic grayling (*Thymallus arcticus*), have also been introduced into the Merced River drainage. Brown trout seems to have become well established and outnumbers rainbow trout in many areas (Stillwater Sciences 2008). Brook trout are found in the main stem and in large numbers in lakes and small streams of the Merced River watershed. Fish introductions in higher elevation lakes and streams, all of which were naturally fishless, have severely altered those ecosystems. The introduction of fish is considered the primary factor in decline of native Sierra Nevada yellow-legged frogs in the Sierra Nevada (Drost and Fellers 1996; Knapp 2003). The NPS discontinued fish stocking in Yosemite in 1991.

The sensitive balance of aquatic ecosystems in Yosemite Valley is likely being disrupted by the presence of nonnative bullfrog and signal crayfish (*Pacifastacus leniusculus*). Bullfrogs are voracious, nonnative predators that would eat anything smaller than themselves. Recent observations and eradication efforts in Yosemite Valley suggest that bullfrogs occupy standing and slow-moving water and lower meadow areas throughout the Valley. Signal crayfish are invasive generalist omnivores and avid predators on freshwater insects and the eggs and larvae of amphibians. Signal crayfish have also recently been observed in the Valley's meadows. The impact of bullfrogs and signal crayfish on native species in the park is not fully understood, but the two species have been implicated in the decline of native amphibian and reptile species. The NPS began bullfrog eradication efforts in 2005, which have succeeded in substantially reducing the local population (NPS 2011).

Wild turkeys, which were introduced widely in California by state authorities, are regularly observed in Yosemite along its western boundary. The impact of this species on park ecosystems is unknown but likely includes predation of small amphibians (i.e., salamanders) and eggs and young of ground-nesting birds (e.g., California quail), competition with native species for food, destruction of native

plants and reduction of their seedling reproduction rates (especially in oaks), soil and forest litter disturbance, and support of unnaturally high predator populations.

White-tailed ptarmigans were introduced as a game species to high elevation areas of east Yosemite, and they have become widespread in the park's alpine habitats. The impact of the ptarmigan has not been determined, but their herbivory likely affects native plants that have a very low rate of growth and productivity.

The European starling and house sparrow are two nonnative species found in El Portal, Yosemite Valley, and other developed areas that affect native bird species through competition for nest cavities, which is a limited resource. Both species are known to aggressively evict native bird species from occupied cavities. The existing development in El Portal has likely increased the abundance of both species by providing additional nesting sites and food sources.

### **Wildlife of the Merced River**

Wildlife species that occur in the Merced River corridor are expected to be generally representative of the wildlife species expected to occur in the park as a whole (THOMPSON 1999). A recent wildlife assessment for the portion of the Merced River that flows through Yosemite Valley used California Wildlife Habitat Relationships models and validation tools to predict the presence of 317 different species (10 amphibians, 21 reptiles, 218 birds, and 68 mammals) in the Valley (NPS 2011). This study only looked at montane riparian and wet meadow habitat types in the Valley, so the total number of species that occur along the entire Merced River corridor is expected to be higher when species that occur only at higher or lower elevations are considered. **Table 9-58** provides an overview of the species associated with predominant habitat types across the entire Merced River corridor, including Yosemite Valley.

In the broadest sense, the presence and abundance of wildlife species at any site or area depend on the structure of the habitat available in that area. Habitat types broadly correlate with vegetation types (or plant associations/communities) or general stream classifications. For many wildlife species, there is an additional requirement for special habitat attributes, such as cliffs, caves, rocks, lakes or rivers, or other abiotic (nonliving) elements. In addition, many species have explicit habitat requirements for one or more elements of the biotic environment, such as large trees, large snags (standing dead trees), large downed logs, high degrees of canopy closure, or, for fish, pools, riffles, and undercut banks. As described in the "Vegetation and Wetlands" section of this chapter, altitude and topography influence vegetation patterns throughout the Merced River corridor. These changes in habitat structure correlate broadly with the changes in the composition and abundance of wildlife species present across the river's various altitudinal zones (i.e., alpine, subalpine, montane, valley, etc.).

Overlaid on the overall elevation pattern is a local topographic effect. Where the river flows through low-gradient reaches, the valleys tend to be broad and relatively flat and are dominated by denser and taller forests than in areas with steeper channel reaches. Thus, locations like Little Yosemite Valley, Yosemite Valley, and the Wawona area tend to have taller and more extensive forests than steeper sections. The broad valleys in the flat reaches also tend to be associated with lakes, saturated soils, and wetlands such as meadows. These wetter areas are important wildlife habitat elements and are

**TABLE 9-58: SUMMARY OF CALIFORNIA WILDLIFE HABITAT RELATIONSHIP TYPES IN THE MERCED RIVER CORRIDOR<sup>a</sup>**

Habitat Type	Dominant Plant Species	Typical Wildlife Species	Amount of Watershed in Habitat type
Barren	Lichens, mosses	Mount Lyell salamander, gray-crowned rosy-finch, American pipit, rock wren, common raven, Belding's ground squirrel, American pika, yellow-bellied marmot	8%
Douglas-Fir <sup>b</sup>	Douglas-fir, sugar pine, ponderosa pine	See Sierran mixed conifer habitat type	<1%
Jeffrey Pine	Jeffrey pine, sugar pine, lodgepole pine, white fir, red fir, incense-cedar	Sagebrush lizard, northern goshawk, red-tailed hawk, golden eagle, mountain quail, Lewis' woodpecker, northern flicker, olive-sided flycatcher, western wood-pewee, Steller's jay, lodgepole chipmunk, golden-mantled ground squirrel, striped skunk, black bear, gray fox, fisher, bobcat, mule deer	5%
Juniper	Western juniper, Jeffrey pine, sagebrush	Sagebrush lizard, western rattlesnake, Say's phoebe, rock wren, common raven, common nighthawk, Townsend's solitaire, pinion mouse, bushy-tailed woodrat, coyote, black bear	<1%
Lacustrine	Algae, sedges	Sierra Nevada yellow-legged frog, western pond turtle, western aquatic garter snake, great blue heron, mallard, spotted sandpiper, Northern river otter, black bear, hardhead, foothill yellow-legged frog, western pond turtle	1%
Lodgepole Pine	Lodgepole pine, aspen, mountain hemlock	Sagebrush lizard, western terrestrial garter snake, northern goshawk, red-tailed hawk, American kestrel, white-throated swift, Williamson's sapsucker, olive-sided flycatcher, mountain chickadee, pine siskin, deer mouse, long-tailed vole, coyote, ermine, long-tailed weasel, black bear	12%
Montane Chaparral	Huckleberry oak, Sierra chinquapin, whitethorn ceanothus, fremont silktassel, bitter cherry	Gilbert's skink, southern alligator lizard, red-tailed hawk, California quail, mountain quail, bushtit, barn swallow, ruby-crowned kinglet, California ground squirrel, Botta's pocket gopher, coyote, California pocket mouse, striped skunk, black bear	<1%
Montane Hardwood-Conifer	Douglas-fir, incense-cedar, ponderosa pine, black oak, big-leaf maple	Western fence lizard, northern alligator lizard, sharp-shinned hawk, Cooper's hawk, calliope hummingbird, red-breasted sapsucker, olive-sided flycatcher, big brown bat, coyote, gray fox, long-tailed weasel, badger, striped skunk, black bear, Sierra Nevada red fox	<1%
Montane Hardwood	Canyon live oak, black oak, Douglas-fir, California laurel	Northern alligator lizard, red-tailed hawk, American kestrel, flammulated owl, Anna's hummingbird, red-breasted sapsucker, Steller's jay, northern flicker, white-throated swift, big brown bat, California ground squirrel, deer mouse, brush mouse, coyote, gray fox, long-tailed weasel, striped skunk, black bear	15%
Montane Riparian	White alder, black cottonwood, willow	Relictual slender salamander, Pacific chorus frog, sharp-tailed snake, red-tailed hawk, mountain quail, warbling vireo, western screech-owl, long-eared owl, belted kingfisher, cliff swallow, black phoebe, American dipper, song sparrow, mountain beaver, black bear, Sierra Nevada snowshoe hare	<1%

**TABLE 9-58: SUMMARY OF CALIFORNIA WILDLIFE HABITAT RELATIONSHIP TYPES IN THE MERCED RIVER CORRIDOR<sup>a</sup> (CONTINUED)**

Habitat Type	Dominant Plant Species	Typical Wildlife Species	Amount of Watershed in Habitat type
Ponderosa Pine	Ponderosa pine, incense-cedar, Douglas-fir, white fir, canyon live oak, black oak, Jeffrey pine, sugar pine	Western fence lizard, western rattlesnake, sharp-shinned hawk, American kestrel, acorn woodpecker, violet-green swallow, barn swallow, yellow warbler, chipping sparrow, California ground squirrel, mountain pocket gopher, coyote, striped skunk, black bear, California spotted owl	19%
Red Fir	Red fir	Western terrestrial garter snake, red-tailed hawk, golden eagle, great gray owl, black swift, olive-sided flycatcher, red-breasted sapsucker, golden-mantled ground squirrel, deer mouse, bushy-tailed woodrat, coyote, long-tailed weasel, black bear, California spotted owl	14%
Subalpine Conifer	Mountain hemlock, lodgepole pine, bristlecone pine, oceanspray, willows	Mount Lyell salamander, Yosemite toad, mountain yellow-legged frog, golden eagle, dusky flycatcher, white-crowned sparrow, Wilson's warbler, golden-mantled ground squirrel, deer mouse, long-tailed vole, yellow-bellied marmot, porcupine, coyote, ermine, black bear	7%
Sierran Mixed Conifer	White fir, Douglas-fir, ponderosa pine, incense-cedar, sugar pine, black oak	Western fence lizard, northern alligator lizard, red-tailed hawk, American kestrel, western wood-pewee, Hammond's flycatcher, ruby-crowned kinglet, big brown bat, long-tailed vole, California ground squirrel, deer mouse, coyote, gray fox, ermine, striped skunk, black bear, Vaux's swift, bald eagle, pallid bat, Pacific fisher	13%
Valley Foothill Riparian	Fremont cottonwood, white alder, willow, California grape	Gilbert's skink, gopher snake, western rattlesnake, common merganser, red-shouldered hawk, cliff swallow, tree swallow, ash-throated flycatcher, American goldfinch, brush mouse, coyote, gray fox, striped skunk, black bear, Valley elderberry longhorn beetle	<1%
White Fir	White fir, sugar pine, incense-cedar	Western fence lizard, northern alligator lizard, sharp-shinned hawk, great horned owl, black swift, Steller's jay, common raven, fox sparrow, dark-eyed junco, big brown bat, Botta's pocket gopher, deer mouse, brush mouse, coyote, ermine, gray fox, striped skunk, American badger, black bear	3%
Wet Meadow	Sedges, rushes, willows	California newt, Yosemite toad, Sierra Nevada yellow-legged frog, California mountain kingsnake, western aquatic garter snake, Pacific chorus frog, mallard, great blue heron, common snipe, great gray owl, northern rough-winged swallow, mountain bluebird, common yellowthroat, California meadow vole, montane vole, western mastiff bat, yellow-bellied marmot, Sierra Nevada mountain beaver, black bear, ermine	1%
<p><sup>a</sup> Source of original information for California Wildlife Habitat Relationship types and areas within each type in the Merced River basin: <a href="http://www.biogeog.ucsb.edu/projects/snner/basins/merc_gapwhr.html">www.biogeog.ucsb.edu/projects/snner/basins/merc_gapwhr.html</a>. The maps and data files on which this summary was based have not been published.</p> <p><sup>b</sup> California Wildlife Habitat Relationship by convention does not assign this habitat type to the southern Sierra Nevada. The area assigned to this type likely should be assigned to the Sierra Mixed Conifer type.</p> <p>SOURCE: NPS 1997, 2010, and 2011.</p>			

associated with a number of the sensitive species known to occur in the park (see the “Special Status Species” section of this chapter).

### ***Segment 1: Merced River Above Nevada Fall***

The headwaters of the Merced River originate above 10,000 feet in elevation in the alpine zone—a zone typified by scant alpine dwarf-shrub, glacial lakes, alpine meadows, and high-velocity tributaries to the Merced River. There are no native fish in the upper Merced River watershed. Birds found in this habitat include American pipit (*Anthus rubescens*) and gray-crowned rosy-finch (*Leucosticte tephrocotis*); mammals include Mount Lyell shrew (*Sorex lyelli*), alpine chipmunk (*Neotamias alpinus*), mountain pocket gopher (*Thomomys monticola*), pika (*Ochotona princeps*), and white-tailed jackrabbit (*Lepus townsendii*). Species that are largely confined to this habitat type are frequently associated with nonliving (physical) attributes of the Sierra Nevada. For example, pikas only find suitable habitat near the uppermost parts of the Merced River basin and use rock crevices and talus slopes.

All fish species in the upper watershed of the Merced River above Yosemite Valley have been introduced. Rainbow trout and brown trout were commonly stocked in upper watershed lakes beginning in the late 1800s. Other species less commonly stocked include the American grayling (*Thymallus signifer tricolor*), cutthroat trout, brook trout, and golden trout. The cutthroat trout (probably Lahontan cutthroat trout) and golden trout are both special status species in their native watersheds in other locations of the Sierra Nevada range, but appear to have lost their genetic integrity through hybridization. Recent surveys indicate that rainbow trout and brown trout are the most abundant species in the Merced River corridor but that brook trout are most abundant in the watershed overall. In Washburn Lake, a popular wilderness fishing destination, rainbow trout make up approximately 20% of the lake’s fish population, while brown trout make up approximately 80% of the fish population.

These higher-elevation forest types have a sparse understory and experience severe winters. Seasonally, many species from lower elevations share this habitat: mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), and species such as the mountain chickadee (*Poecile gambeli*) and the brown creeper (*Certhia americana*).

As Jeffrey pine (*Pinus jeffreyi*) becomes more common (below about 7,500 feet), the wildlife habitats support more species and higher populations. The Jeffrey pine forest is more productive than the subalpine forests, largely due to the food value of the pine seeds. The seeds support a more complex small-mammal fauna, which in turn supports the Sierra Nevada’s most elusive predator—the fisher (*Martes pennanti*)—in addition to raptors, including northern goshawks (*Accipiter gentilis*) and great gray owls, all species recorded in or near the Merced River corridor (CDFG 2012). Bird species common to this zone include Cassin’s finch (*Haemorhous cassinii*), Townsend’s solitaire (*Myadestes townsendi*), Lincoln’s sparrow (*Melospiza lincolni*), and common raven (*Corvus Corax*). Mammals include Douglas squirrel (*Tamiasciurus douglasii*), northern flying squirrel (*Glaucomys sabrinus*), golden-mantled ground squirrel (*Callospermophilus lateralis*), porcupine (*Erethizon epixanthum epixanthum*), and long-tailed weasel.

As the river descends into Little Yosemite Valley, wildlife habitat is altered with increased human presence. Human alteration of habitat is most pronounced between Nevada Fall and the Little Yosemite Valley Backpackers Camping Area. Species adapted to human disturbance, such as black bear, (*Ursus americanus*) are relatively common. More reclusive or specialized species are rare or absent. Human use, such as pack stock and development in riparian areas, may also adversely affect aquatic habitat for Yosemite toad (NPS 2011a). On the whole, these affected areas represent a small portion of Segment 1 of the main stem.

### *Segment 2: Yosemite Valley*

Yosemite Valley is a broad, U-shaped valley characterized by black oak woodland, lower montane mixed coniferous forest, a vigorous riparian corridor along the Merced River, low-elevation meadows, and areas of development (Cardno ENTRIX 2011). In Yosemite Valley, the Merced River is broad, shallow, and slow-moving (compared to other river stretches). Inside Yosemite, there are concentrated areas of human use that have affected wildlife and their habitats, especially in the east Valley. This is also where some of the most valuable and sensitive habitats are located or once existed. Meadow and riparian areas are highly productive, structurally diverse habitats that support high species diversity and provide important linkages between terrestrial and aquatic communities. The long history of development and human use in the Valley has resulted in fragmentation and reductions of these habitats, thus affecting their quality for wildlife. Recent park efforts, associated with fire management and meadow and riparian restoration projects, have begun to make improvements in Valley habitats (Cardno ENTRIX 2011).

Mammals (resident or transient) in Yosemite Valley include deer mouse (*Peromyscus maniculatus*), California ground squirrel (*Otospermophilus beecheyi*), western gray squirrel (*Sciurus griseus*), broad-footed mole (*Scapanus latimanus*), Botta's pocket gopher (*Thomomys bottae*), ringtail, raccoon, coyote, bobcat, mule deer, mountain lion, and black bear (NPS 2011). The heavy visitation to Yosemite Valley and its relatively high number of resident employees have led to many human/wildlife conflicts. The root of most of these problems is the availability of human food. Improperly stored food and garbage and deliberate feeding alter the natural behavior of wildlife and lead to property damage and threats to human safety. In 2011, over \$15,000 in property damage (110 incidents) was caused by black bears in the park (NPS 2011). Animals that become habituated to humans can lead to human-wildlife conflicts. These issues would escalate with higher visitation. Potential affected wildlife include bears, deer, coyotes, raccoons, mountain lions, and California ground squirrels. Roadkill of numerous species is likely proportional to the amount of vehicle traffic (K. Rodriguez, pers. comm).

In recent years, mountain lion sightings in Yosemite Valley have increased (NPS 2011b). These sightings, coupled with two human fatalities in California from mountain lion attacks in 1994, have caused concern. Lions are attracted to the unnaturally high prey populations that are supported by human food sources in developed areas. Further reduction of lion habitat from development or expanded human presence could affect lion populations and increase the chance of human-mountain lion encounters.



The Merced River widens and slows as it passes through Yosemite Valley. In general, habitat is characterized by a relatively wide channel, relatively low flows, and little riffle and pool habitat. The deposition and removal of soil and the force of flood waters in Segment 2 regularly disturb riparian vegetation. The park has historically cleared large woody debris from the Merced River to improve flow (to reduce flooding hazard), prevent bank erosion that might compromise park infrastructure, for visitor safety, to remove hazards to commercial rafting, and for aesthetic reasons. Since 1993, it has been park policy to allow woody debris in the Merced River to remain, sometimes with some manipulation in its placement, unless it causes a serious safety concern or threatens infrastructure. As a result, large woody debris in the channel is gradually returning through natural processes and active restoration (Cardno ENTRIX 2011). Undercut banks and exposed tree roots provide some refuge for young fish and other small organisms. The Merced River and its floodplain are connected in many areas, but some connections have been affected by development of trails, roads, and campgrounds in the first half of the 20th century.

Fisheries resources in Yosemite Valley have historically been low in species diversity. Species native to the Merced River in the Valley probably only included rainbow trout (that migrated into the area from the San Joaquin River) and the Sacramento sucker. Nonnative strains of rainbow trout and brown trout have been stocked throughout Segment 2 of the Merced River and currently dominate the fisheries of this area. The Sacramento sucker is still common here, and an occasional brook trout is reported from the area—probably a result of transport via the river from their more favorable habitat in higher tributaries (Stillwater Sciences 2008).

Riparian restoration efforts are underway along the banks of the Merced River in Yosemite Valley and are likely to have a positive effect on fish populations. The projects range from removal of bank revetment to restoration of riparian vegetation (Cardno ENTRIX 2011). In 1997 and 1998, surveys were conducted to examine the effects of riverbank restoration, with special attention to the presence of large woody debris and the association of fish to those areas. Rainbow trout density appeared higher at restoration sites, while brown trout and Sacramento sucker densities were higher at the control sites (USFWS 1999).

### *Segments 3 and 4: Merced Gorge and El Portal*

Montane hardwood conifer (mixed conifer) is the predominant upland type adjacent to riparian areas at the elevation of Yosemite Valley and below in Segments 3 and 4. As such, its wildlife community includes species common to higher and lower elevations, leading to high species diversity.

The Merced River gorge (Segment 3) is a unique case of lower elevation habitat. It is lined with a narrow band of riparian vegetation along the river, bordered by a dense mosaic of chaparral and foothill woodland communities (chaparral/oak woodland zone) on the steep canyon walls. Birds commonly found in this zone include western scrub-jay (*Aphelocoma californica*), California towhee (*Melospiza crissalis*), Hutton's vireo (*Vireo huttoni*), California thrasher (*Toxostoma redivivum*), Bewick's wren (*Thryomanes bewickii*), oak titmouse (*Baeolophus inornatus*), wrentit (*Chamaea fasciata*), Nuttall's and acorn woodpeckers (*Picoides nuttallii* and *Melanerpes formicivorus*, respectively), and red-tailed hawk (*Buteo jamaicensis*). Mammals include western harvest mouse

(*Reithrodontomys megalotis*), dusky-footed woodrat (*Neotoma fuscipes*), spotted skunk (*Spilogale gracilis*), mule deer, and bobcat. More significantly, the rocky outcrops and associated crevices of the gorge probably harbor a high density of special status bat species (e.g., spotted bat (*Euderma maculatum*), western mastiff bat (*Eumops perotis*)) (CDFG 2012). Many of these species are also present in Yosemite Valley. Several bat species, such as Townsend's big-eared bat (*Corynorhinus townsendii*) and Yuma myotis (*Myotis yumanensis*), occasionally use human structures where they are vulnerable to impact (NPS 2011a).

Downstream of the Cascades area, the velocity increases as the river enters the gorge, heading toward El Portal. The relatively undisturbed riparian habitat, especially on the south side of the river, and the known presence of Valley elderberry longhorn beetle and adjacent California spotted owl habitat contribute to El Portal's biological resources (NPS 2011a). The river reach in El Portal is characterized by steep gradients, large boulders strewn throughout the channel, and frequent pools and cascading waterfalls. The north side of the canyon consists of foothill pine and oak woodland vegetation. The floodplain is minimal, if at all, in this reach. Fishes native to the Merced River below El Portal include rainbow trout, Sacramento sucker, Sacramento pikeminnow, hardhead, California roach (*Hesperoleucus symmetricus*), and the riffle sculpin. This reach of the river also supports introduced populations of smallmouth bass (*Micropterus dolomieu*), rainbow trout, and brown trout.

#### ***Segment 5: South Fork Merced River Above Wawona***

The South Fork Merced River originates at an elevation of 10,500 feet and flows westward, supporting alpine and montane meadow and chaparral, coniferous, and deciduous forest habitats. These habitats are similar to those described for Segment 1 in the upper reaches of the Merced River.

#### ***Segments 6–8: Wawona Impoundment, Wawona, and South Fork Merced River Below Wawona***

At Wawona, the South Fork Merced River meanders mainly through coniferous forest, with smaller areas of chaparral, broadleaf forest, and meadow. Big Creek, a tributary of the South Fork Merced River, meanders through Wawona Meadow before reaching the river. Wawona Meadow and the associated riparian habitats—intact vegetation consisting of aspens, willows, and alders—support the occasional willow flycatcher (NPS 2011a). Although willow flycatchers no longer nest in Yosemite National Park (Siegel et al. 2008), this species formerly occupied Wawona Meadow and they are occasionally observed as transient individuals.

The availability of snags and prey resources along the South Fork Merced River provide suitable nesting and foraging habitat for great gray owls year-round. Stream habitats support a sensitive invertebrate, the Wawona riffle beetle (CNDDDB 2012).

The South Fork Merced River supports self-sustaining populations of introduced brook, rainbow, and brown trout. There is less angler pressure on the South Fork Merced River than on the main stem due to difficulty of access and terrain. The significant presence of large woody debris, particularly in the uppermost reaches; dense riparian vegetation; overhanging trees; consistent riffle and pool habitat; waterfalls; and boulders all contribute to the quality of aquatic habitats.

## *Environmental Consequences Methodology*

Proposed management actions under each alternative are evaluated in terms of the context, intensity, and duration of the impacts, as defined below, and whether the impacts are considered beneficial or adverse to the natural environment. Generally, the methodology for natural resource impact assessment follows direction provided in the *Council of Environmental Quality Regulations for Implementing the National Environmental Protection Act*, section 1508.27.

Four primary parameters are used to evaluate impacts: (1) the amount and distribution of wildlife habitat; (2) the integrity and quality of habitat (including past disturbance); (3) the relative importance of habitat as related to productivity; and (4) the potential for disturbance from human presence, including radiating impacts (the term “radiating impacts” is used to indicate that habitat quality diminishes as a negative function of the distance from development). Radiating impacts are especially pronounced in small habitat fragments. Impacts on the native plant communities and hydrologic processes that support wildlife habitat are assessed under the “Vegetation” and “Hydrology, Floodplains, and Water Quality” sections in this chapter. Analysis was based on the assumptions listed below.

- The greater the size of a biotic community and the stronger its links to neighboring communities, the more valuable it is to the integrity and maintenance of biotic processes. Development may potentially limit the size of a community and/or fragment and disassociate communities from each other.
- The more developed areas become, the less valuable they are as wildlife habitat. New development would increase human presence and increase the potential for disturbance in the area of the development. The potential for negative wildlife interactions (such as human injury from wildlife and the introduction of unnatural food sources) also would increase. The removal of development from an area would increase the value of the habitat. However, it is important to recognize that in some cases, existing development serves to concentrate visitor impact and reduce disturbance associated with dispersal of the same number of visitors. “Containment” of disturbance within a designated area may preserve integrity of habitat and prove more valuable to wildlife than dispersed use.
- The effects of human food and garbage on the behavior, distribution, and abundance of wildlife species would continue in existing developments and would begin in new developments.
- Disturbance in or near a river and its tributaries might reduce the productive capabilities of associated natural communities. Modifications to river form (including those that would constrain the river from migrating or changing course), soil compaction, loss of riparian vegetation, removal of woody debris, and accelerated erosion and sediment transport influence important habitat characteristics such as riffle/pool complexes, substrate type, location, and cover. These physical aspects often determine the composition of vegetative and aquatic communities. Decomposed organic material from meadow, wetland, and riparian vegetation provides the primary nutrient source to adjacent aquatic communities as it is transported to the river via seasonal surface water flows and leaves dropped into the water from riparian deciduous trees and shrubs. Modifications that prohibit surface or subsurface water flows into meadow and wetland habitats might cause instability in these habitats.

Removal of riparian vegetation and woody debris might alter or disrupt the critical link between terrestrial and aquatic ecosystems.

- Roads are generally barriers to wildlife and fragment habitat.
- Noise and light pollution negatively affect wildlife species.
- Development and impacts in riparian zones may influence critical water quality elements such as water temperature, suspended sediments, and nutrients. These elements interact in complex ways in aquatic systems and directly and indirectly influence patterns of growth, reproduction, and migration of aquatic organisms.
- Ecological restoration of native communities would involve some short-term adverse impacts (e.g., smoke from prescribed burning) but over time can successfully replicate natural processes.

This impact assessment considers the potential effects that implementation of the Merced Wild and Scenic River Comprehensive Management Plan (Merced River Plan) could have on wildlife resources. Information on wildlife habitats and species in the study area derives from the Yosemite Parkwide Vegetation Map (1997) and other studies, including the *2010 Assessment of Meadows in the Merced River Corridor, Yosemite National Park* (Ballenger et al. 2011), the *Merced River and Riparian Vegetation Assessment* (Cardno/Entrix 2011), and the *Wildlife Conditions Assessment for the Merced River Corridor in Yosemite Valley, Yosemite National Park* (Espinoza et al. 2011). Quantitative analysis was used wherever possible; however, when quantitative analysis was not feasible, qualitative analysis was used. Qualitative analysis relies substantially on professional judgment, supported by extrapolation of relevant research, where appropriate, to reach reasonable conclusions as to the context, intensity, duration, and type of potential impact.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the river. This analysis further identifies if there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area in Yosemite National Park. Regional impacts would be those that extend to the Yosemite Sierra-wide. Context suggests that certain impacts depend upon the setting of the proposed action. For example, impacts that reduce the value of the Merced River in providing connectivity between habitat types could be minor if such connections are abundant in a given region, but could be moderate or major if they are not.
- **Intensity.** The intensity of the impact considers effects of an action on the size and integrity of native habitats, diversity, and species populations. These designations are used to describe both beneficial and adverse impacts. Negligible impacts would have no measurable or perceptible changes on wildlife habitat or populations. Minor impacts would be local within a relatively small area, and the impacts on the integrity of animal populations would not be expected to have an overall effect on natural community structure. Without further impacts, negative effects may be reversed, and habitat quality would recover. Moderate impacts would be clearly detectable on wildlife habitat and populations and would be sufficient to cause a change in the abundance, distribution, quantity, or integrity of species; community ecology (e.g., the numbers of different kinds of species present); or natural processes (e.g., hydrology).

Major impacts would be substantial and highly noticeable, with the potential for permanent landscape-scale changes in the distribution, diversity, or dynamics of species populations; community ecology; and natural processes. Impacts on wildlife are quantified where possible by determining the acreage of wildlife habitat types altered. The amount of each habitat type that would be directly affected is determined by a comparative analysis of habitat spatial data representing existing conditions and conditions under proposed management actions. Radiating impacts and effects associated with habitat distribution and patch size are also addressed quantitatively where baseline data are available to support such an analysis. Other potential direct and indirect effects on wildlife habitats, such as effects associated with invasive species or the potential for disturbance to wildlife populations due to increases in human activity, are analyzed qualitatively.

- **Duration.** A short-term impact would have an immediate effect on native habitat, diversity, and native populations but would not cause declines or increases in populations or diversity over time. Short-term impacts are normally associated with transitional types of activities, such as facility construction. Long-term impacts would lead to a loss or gain of native habitat, diversity, and species populations as exhibited by a decline or increase in species abundance, viability, and/or survival.
- **Type of Impact.** The type of impact considers whether the impact would be beneficial or adverse. Impacts are considered beneficial if an action causes no detrimental effect and results in an increase in the size or integrity of species populations or habitat components; reduces disturbance to native ecosystem processes; increases native species richness/diversity; or otherwise increases native habitat quantity and quality. Impacts are considered adverse if they reduce the size, integrity, or diversity of native habitat.

### *Environmental Consequences of Alternative 1 (No Action)*

#### **All River Segments**

Alternative 1 (No Action) would be a continuation of current conditions and management. There would be no comprehensive changes to the management of the Merced River corridor. Under Alternative 1, the NPS would retain (and potentially revise) current management policies pertaining to wildlife. Current management plans that include goals to enhance wildlife habitat in the Merced River corridor (as described under “Affected Environment”) would continue to be implemented, resulting in long-term, beneficial effects throughout the Merced River corridor.

#### *Impacts of Actions to Protect and Enhance River Values*

As described in “Chapter 8: Alternatives,” impediments to channel free flow and their associated impacts would continue in all segments of the Merced Wild and Scenic River corridor. All riprap and abandoned infrastructure in the river channel and meadow floodplains would remain, which may continue to alter the free-flowing condition of the river and constrain the river from naturally migrating and changing course.

Although some large woody debris would be left in place in the river channel, the NPS would continue to remove large woody debris where there are threats to human safety or infrastructure. This action

would continue to influence habitat characteristics in the channel, such as riffle/pool complexes, cover for aquatic species, and stability of riverbanks.

Informal meadow trails would largely remain under Alternative 1 (No Action). Riparian habitat would continue to be protected at current levels. However, continued visitor presence along the sensitive riverbank of the Merced River would continue to cause local riverbank erosion and scouring effects associated with bridges would continue. Conifer encroachment would continue to be managed with fire reintroduction. Meadow habitat would continue to be protected and enhanced by the Invasive Plant Management Plan Update, which eradicates (or at least controls) invasive plant species; prevents new invasions; restores and maintains desirable species composition; enhances the visitor experience; and educates park staff, partners, and users in protecting meadow habitat. These ongoing riverbank erosion and scouring effects, except for the management of encroaching conifers, would result in continued impacts on meadow and riparian habitats, including habitat fragmentation, reduced productivity of riparian and adjacent aquatic communities, and potential disruption of connectivity between terrestrial and aquatic habitats.

Despite some ongoing impacts that would occur under Alternative 1, the NPS would also continue restoration projects to mitigate for impacts on biological values. Restoration projects would continue in several Yosemite Valley meadows such as Bridalveil, Cook's, and El Capitan meadows, as well as riverbank restoration at North Pines Campground. The NPS would also continue invasive species control, where such plants are present, and conifer removal from some meadows. These ecological management actions would increase habitat integrity by reducing fragmentation and providing connectivity between habitat communities, reducing erosion along riverbanks, enhancing habitat quality for terrestrial and aquatic wildlife, and continuing to promote good water quality. Thus, current ecological management actions under Alternative 1 would enhance biological values and result in long-term, minor, beneficial effects on aquatic and terrestrial wildlife throughout the Merced River corridor.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Alternative 1 (No Action) would perpetuate the kinds and amounts of use that exist today. No new structures would be constructed in the Merced River corridor under Alternative 1 (e.g., no new campsites would be built at the former Lower and Upper River Campgrounds; this area would be allowed to passively revert to natural conditions). Habitat for wildlife would improve over time in areas allowed to revert to natural conditions. New structures that would be constructed would be minor in nature; temporary; easily removed; not habitable; designed to support existing uses, systems, and programs; located in the existing building footprint; and not created solely for commercial purposes. Temporary housing for employees displaced primarily by the flooding in 1997 at Curry Village area and temporary housing at the Lost Arrow parking lot in Yosemite Village would continue as needed. Housing for NPS employees and park partner staff would remain in current locations and at current levels.

Many resource impacts derived from visitor and administrative use in all river segments would continue to be present. Informal trails, bicycle paths, campsites, roads, bridle paths, parking, staging areas, and trails would remain in some sensitive habitat areas, such as meadows and adjacent to



riparian habitat or within the 100-year floodplain. Traffic congestion, lack of parking spaces in high-use segments (e.g., Segments 2, 4 and 7), and improper parking adjacent to or on edges of meadows would continue to affect meadow habitats and terrestrial and aquatic wildlife. Traffic congestion, for example, would continue to affect wildlife species such as black bears from vehicle-bear collisions. To date, seventeen bears have been reported hit by vehicles in 2012 and nineteen bears were hit in 2011 (NPS 2012a). Some adverse impacts would be mitigated through continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use. Although some areas would be allowed to revert to natural conditions under Alternative 1 to benefit local wildlife (i.e., the former Lower and Upper River Campgrounds), overall current visitor use and facility management actions under Alternative 1 would result in long-term, minor, adverse impacts on biological values such as habitat integrity, contiguity, and quality for wildlife.

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

The continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, use of the wilderness trailhead quota system, and restrictions on amounts and locations of overnight use, would protect intact natural habitats, including the distribution, numbers, population composition, and interaction of native species. The NPS would continue efforts to monitor use, eliminate inappropriate uses (such as informal trails), and restore affected sites to natural conditions. Overall, habitat for wildlife in the Yosemite Wilderness within Segment 1 would remain undisturbed excluding trail corridors, as noted below, and no effect would result.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Wilderness above Nevada Fall would continue to be managed for wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Primary visitor activities would consist of hiking and overnight backpacking, with designated or dispersed camping.

Wildlife habitat adjacent to trail corridors would continue to be affected by ongoing use. Habitat in lightly used alpine areas would remain relatively undisturbed. Impacts in these Wilderness areas would be very minor associated with occasional noise, human presence, and some modification to habitat from vegetation loss and soil compaction along trail corridors. In subalpine areas, site-specific impacts would result from foot and stock traffic along trail corridors. These activities would include disturbances such as noise, human presence, stock presence and impacts to habitat such as vegetation trampling, soil compaction, and manure deposition by pack stock. If campground and trail use continues at current levels, adverse impacts could occur at scarcer wet-meadow habitats, thereby affecting wildlife species associated with these habitats. The small diversion dam at the top of Nevada Fall would remain in place, resulting in continued impacts on the free-flowing condition of the Merced River. However, as noted above, the NPS would continue to implement site-specific restoration projects to halt or reverse these adverse effects. Therefore adverse impacts on wildlife associated with trail use would be local, minor, and long term.

Coniferous forest habitats along the upper Merced River are structurally diverse and expected to continue to support a full community of associated wildlife species under Alternative 1, even with the continued local, long-term, minor, adverse impacts associated with popular dispersed campsites and visitor use areas. Further downstream (into Little Yosemite Valley), in areas with less understory vegetation, continued concentrated human use along the north side of the Merced River would also result in local, long-term, minor, adverse effects on wildlife habitat.

Although administrative and concessioner stock (horses and mules) are typically contained in corrals and pastures away from the Merced River, there would continue to be a minor, adverse impact on wildlife near these areas. For example, cowbirds tend to occur in areas of heavy horse use; this bird species has a detrimental effect on native songbird populations through brood parasitism. Likewise, the continued use of trails by horses and mules could increase cowbird parasitism, in addition to the adverse impact on water quality from trail runoff. Runoff can affect adjacent aquatic habitats by introducing unnaturally high levels of nutrients such as nitrogen. Horse and mule droppings could furthermore lead to the introduction of nonnative plant species and cause locally increased populations of insects such as flies. Based on these factors, adverse impacts on wildlife associated with concessioner stock would be local, minor, and long term under Alternative 1.

Continued concentrated human use would have a local, minor, adverse effect on wildlife in the vicinity of the Moraine Dome Camping Area, Merced Lake High Sierra Camp, Merced Lake Backpackers Camping Area, and Little Yosemite Valley Backpackers Camping Area through trampling of understory vegetation and disturbances, including noise, artificial light, and human presence (including the presence of human food and garbage). As discussed under the *Impacts of Actions to Protect and Enhance River Values* section above, stock presence and vegetation trampling, soil compaction, and pack stock manure along the trails would continue to adversely impact meadow and aquatic habitats in Segment 1. Concentrated use would continue local, minor, adverse impacts by locally reducing understory vegetation and downed wood (from firewood collection), thus directly disturbing wildlife and providing unnatural food sources. However, concentrated human use would continue to have a beneficial effect on the park's management of human/mountain lion encounters, which are more common when human use is dispersed (Beier 1991).

## Segment 2: Yosemite Valley

### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 1 (No Action), fill material, compacted soils, and a network of roads at the former Pine and Oak units at Yosemite Lodge would remain in place and provide little or no suitable habitat for wildlife. Pack stock trail use within the ordinary high-water mark between Clark's Bridge and the Curry Village stables, and the placement of the Upper Pines Campground dump station and Camp 6 unimproved parking lot in proximity to the river would continue to impact riparian habitat and potentially contribute to water quality impacts. The river channel between Clark's Bridge and Sentinel Bridge would continue to widen and exhibit low channel complexity. Lack of designated river access from the Pohono Bridge to the Cascades Diversion Dam would continue to affect riparian habitat and riverbanks in this area. These practices would continue to be potential contributors to water quality impacts in localized areas of the river through accelerated erosion and sediment deposition in the river

and result in long-term, minor, adverse impacts on aquatic and terrestrial wildlife associated with riverine habitat (including meadows and riparian habitat adjacent to the river).

Aquatic habitats in Segment 2 have long been subject to large wood management, which results in the modification of the aquatic habitat through the selective removal or replacement of woody debris from the stream channel. This practice adversely affects natural stream dynamics, reduces habitat diversity for aquatic organisms, and adversely affects nutrient cycling in these habitats by removing a natural source of nutrient input. Large wood management would continue under current practices. Streambank destabilization in the vicinity of wood removal would continue, causing a local, long-term, minor, adverse impact on aquatic habitat for fisheries and wildlife.

Under Alternative 1, human-constructed ditches, informal trails, abandoned roadbeds and infrastructure, trails in inundated areas, and informal roadside parking in meadow habitat would continue to adversely affect meadows and wetlands in Yosemite Valley by altering the hydrology of these habitats. Conifer encroachment into meadows would continue to affect meadow hydrology. The former Upper River and Lower River campgrounds area is critical to providing hydrologic connectivity between Ahwahnee and Stoneman meadows; however, it is currently not functioning as a healthy riparian and floodplain ecosystem due to lost topography (graded landscape and filled drainages), compacted soils, existing (amphitheater) and abandoned infrastructure, and invasive plant infestations. These factors would continue impact meadow habitat and wildlife species using this habitat. Alternative 1 would allow the former Upper River and Lower River Campgrounds to passively revert to natural conditions, which would be beneficial to wildlife in the long-term.

As discussed in the “Vegetation and Wetlands” section of this chapter, meadow habitat acreage in Yosemite Valley has substantially diminished from levels present during pre-Euro-American times and has affected dependent wildlife species such as Pacific chorus frog and red-winged blackbird. The park has already instituted meadow restoration and prescribed burning programs that benefit meadow hydrology, plants, and wildlife, and these programs would continue under Alternative 1, thereby offsetting some of the adverse effects associated with habitat loss over time.

In forested habitats, encroachment of conifers into California black oak woodlands has altered species composition, abundance, and diversity. Encroachment would continue under Alternative 1 due to the inability to manage trees in and surrounding developed areas with prescribed fire. The encroachment of conifers into California black oak woodlands has affected the availability of acorns, an important seasonal food source for species such as black bears, mule deer, acorn woodpeckers, gray squirrels, and numerous small rodents. Furthermore, conifers provide less suitable habitat for species such as great-horned owls, yellow-rumped warbler, and western bluebird. This effect would be local, long term, minor, and adverse in Segment 2.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 1 (No Action), size, structure, productivity, and continuity (within habitat and between habitats) of wildlife habitats in Yosemite Valley would continue to be affected by existing improvements and visitor use. In general, adverse impacts on wildlife resources in Segment 2 under Alternative 1 would be local, minor, and long term.

The Merced River in Yosemite Valley would continue to provide for a diversity of river-related and other recreational opportunities. Overnight capacities, employee housing (including temporary housing), visitor day and administrative parking capacity, and administrative activities are well established and would remain as they are today. Most campsites in Valley campgrounds would be retained; the former Upper and Lower River campgrounds would be allowed to be passively restored to natural conditions. In general, parking demand in Yosemite Valley exceeds supply during peak-use periods, resulting in overflow parking on shoulders along roadways and sometimes in sensitive meadow habitats, thereby resulting in local, minor adverse impacts on wildlife that use these habitats.

Continued operation of overnight lodging units in the floodplain and heavy foot traffic associated with campgrounds, lodging, rafting operations, and picnic areas would continue to denude riparian habitat in localized areas. Heavily used areas in the Valley can approach the level of disturbance normally associated with an urban park. During reconnaissance surveys in 1998, for example, bird diversity at Yosemite Falls was characterized by a preponderance of disturbance-tolerant species. Earlier researchers at the park (Foin et al. 1977, cited in Knight and Gutzwiller 1995) found that more disturbance tolerant species such as Brewer's blackbirds and mountain chickadee increased in areas near visitor trails, while other species (e.g., dark-eyed junco) decreased. It is anticipated that these patterns would continue under Alternative 1.

Overall, continued use of improvements at current levels of intensity would have a segmentwide, long-term, moderate adverse effect on wildlife use of the riparian corridor and adjacent habitats in Yosemite Valley. Wildlife and their habitats are currently affected by the overall amount of noise, traffic, and human presence, and the effect would continue for riparian-dependent species (e.g., belted kingfisher, warblers, and flycatchers) at developments such as North and Lower Pines campgrounds and Camp 6. Wildlife habitat tends to be fragmented along the riparian zone in the east Valley because of developed campgrounds, parking lots, and roads. Habitat fragmentation would continue to restrict wildlife movement in this area under Alternative 1.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), the Merced River in El Portal would continue to be confined by riprap and levees, abandoned infrastructure and imported fill in floodplain habitat would remain, and Greenemeyer sand pit would continue to contain fill material that precludes natural flooding and development of riparian vegetation. Water quality may be affected by surface water runoff that transports sediment and automotive fluids from roadside parking areas between the Merced River and Foresta Road. These effects would continue to result in long-term, local, minor, adverse impacts on channel free-flow, water quality, riparian habitat development, and aquatic and terrestrial wildlife that inhabit these habitats.

Valley oaks in Segments 3 and 4 would continue to be affected by vehicles parking under the drip line of the trees. This practice compacts soil under the trees, thus affecting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak

seedlings can be recruited. Current practices would result in long-term, local, minor, adverse impacts on valley oak habitat, thereby affecting wildlife species that depend on this habitat type.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Montane hardwood conifer is the dominant habitat type in Segments 3 and 4, adjacent to riparian areas below Yosemite Valley. This habitat type is broadly transitional between upper-elevation forest types to chaparral and is thus the most important type for migratory wildlife and their associated predators. Access by wildlife to these habitats is affected on the north side of the Merced River by roads, employee lodging, and other human activities and existing development. In contrast, habitats on the south side of the river are relatively free of human made barriers or disturbances. These conditions would continue to occur under Alternative 1 (No Action), resulting in long-term, local, minor adverse impacts on wildlife resources in Segments 3 and 4 over the long term.

Visitor activities in Segments 3 and 4 include scenic driving along El Portal Road and river-related recreational activities. Visitor pass-through use would continue to be the majority of use in Segments 3 and 4. There are no overnight accommodations for park visitors in these segments that are on park land. Due to the low levels of visitor use and no overnight accommodations in Segments 3 and 4, the amount, distribution, and integrity of wildlife habitat would remain relatively intact and the potential for human disturbance from human-related activities and presence would remain low. Impacts from current actions to manage visitor use and facilities in Segments 3 and 4 would result in continued long-term, local, minor adverse impacts on wildlife habitat and wildlife species in these segments.

#### **Segments 5–8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use, would protect intact natural habitats, including the distribution, numbers, population composition, and interaction of native species. In general, long-term adverse impacts on wildlife resources in Segments 5– 8 through implementation of Alternative 1 (No Action) are considered to be local and minor. Habitats upstream and downstream of Wawona along the South Fork Merced River are relatively inaccessible and intact. Implementation of Alternative 1 would not substantially alter the form or function of these communities.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Visitor use in Segments 5 and 6 would remain very low, and river values would remain protected under Alternative 1 (No Action). Visitor activities in Segment 7 include river-related activities, picnicking, camping, lodging, education and interpretation at the Pioneer Yosemite History Center, special events at the Wawona Hotel, and golfing. Overnight accommodations are provided by the Wawona Hotel and Wawona Campground. Visitor activities in Segment 8 consist of day visitors swimming, hiking, or other participating in other river-related activities. There are no overnight lodging accommodations in Segment 8. Any future improvements to visitor facilities would occur in previously developed areas

(associated with the Wawona Store and bus stop). Riparian habitat restoration would be implemented at the Wawona Maintenance area, and roadside parking would be removed between the Wawona Store and Chilnualna Falls Road.

For the coniferous and deciduous forests adjacent to Wawona, habitat fragmentation caused by existing development and use would continue to affect wildlife under Alternative 1. With the continued use of these areas, this alternative would result in long-term, minor, adverse impacts on wildlife. Planned habitat restoration would mitigate for some of these adverse impacts, resulting in long-term, negligible, adverse impacts on wildlife.

The South Fork Merced River supports self-sustaining non-native populations of rainbow and brown trout. There is less pressure by anglers on the South Fork Merced River fisheries than on the main stem because of the difficult access and terrain. There would therefore be no effect on fisheries in the South Fork Merced River under Alternative 1.

### **Summary of Alternative 1 (No Action) Impacts**

Past development and human activity in the Merced River corridor have in some cases adversely affected wildlife habitat. Under Alternative 1 (No Action), some adverse trends to wildlife habitat would continue to occur. These include a reduction in habitat quality for riparian and wet-meadow-dependent wildlife where these habitats are near or adjacent to existing developments and high visitor use areas; a trend toward a loss of habitat connectivity and increase in habitat fragmentation; an increase in human-related disturbance; and continued competition between native wildlife and nonnative species and disturbance-tolerant wildlife.

The NPS would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*, and *Invasive Plant Management Plan*) and make incremental improvements to wildlife habitat on a project-by-project basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and reestablishment of oak woodland habitat would continue on a site-by-site basis rather than on a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place under current direction, “reactive” resource management is not always effective at protecting sensitive resources over the long term. Therefore, effects on wildlife would continue to be adverse, segment-wide, moderate and long term, especially in areas of high human use such as Yosemite Valley, El Portal, and Wawona (Segments 2, 4, and 7). Other river segments would be less affected by Alternative 1, resulting in long-term, local, negligible adverse impacts.

### **Cumulative Impacts of Alternative 1 (No Action)**

Cumulative impacts on wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of Alternative 1 (No Action). The projects identified below include those that have the potential to affect local wildlife patterns (i.e., within the Merced River corridor) as well as large-scale or regional wildlife patterns.



### **Past Actions**

Wildlife communities have been manipulated almost since the beginning of Yosemite National Park. Regional wildlife has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of nonnative species. Fur-bearing mammals were trapped by park rangers until 1925; lions were considered dangerous predators and controlled through the 1920s; and bears were artificially fed as a tourist attraction until 1940. Natural wildfires, with their generally beneficial effects on wildlife habitat, were routinely suppressed until 1972 (Wuerthner 1994). Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

Yosemite's mammal species that were once thriving within the park but are now extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by human activity but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley for a variety of complex reasons, including parasitism by brown-headed cowbirds, destruction of riparian and meadow habitat, past cattle grazing, nest predation, and lack of a regionally sustainable population. On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including Yosemite. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes.

Amphibians in Yosemite have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, Sierra Nevada yellow-legged frogs and Yosemite toads are still present in a number of areas but are severely reduced in population and range. Foothill yellow-legged frogs are no longer found anywhere in Yosemite Valley, and may no longer be found in the park. However, one population of foothill yellow-legged frog occurs adjacent to the park boundary on the Tuolumne River, and there may be a small population in the park. Focused surveys have not been conducted to confirm this species' existence in the park. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, nonnative fish, pesticides, and diseases. Most fish currently found in the Merced River and its tributaries in Yosemite have been introduced. Prior to trout stocking for sportfishing, native fish in Yosemite were probably limited to the rainbow trout and the Sacramento sucker, both of which were present only in the lower portions of the Merced River (i.e., Yosemite Valley and below). Rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or has displaced, the original strain.

A list of past, present, and future projects and plans that could have a cumulative effect on wildlife are summarized in Appendix B. Past projects and plans that could have a cumulative effect on wildlife include the following:

- **Management and Restoration:** *South Fork and Merced Wild and Scenic River Implementation Plan*, Cascades Diversion Dam Removal, Cook's Meadow Ecological Restoration, Fern Springs Restoration, Happy Isles Dam Removal, Happy Isles Fen Habitat Restoration Project,

Happy Isles Gauging Station Bridge Removal, Lower Yosemite Fall Project, Merced River Ecological Restoration at Eagle Creek Project, Red Peak Pass Trail Rehabilitation

***Present Actions***

Current facility-related projects and plans that could have a cumulative effect on wildlife include the following:

- ***Facility Development:*** Crane Flat Utilities, *East Yosemite Valley Utilities Improvement Plan/Environmental Assessment*, Wahhoga Indian Cultural Center, Parkwide Communication Data Network, South Entrance Station Kiosk Replacement, Tioga Road Rehabilitation.

Beneficial impacts for present management and restoration actions are similar to those discussed for past actions. Specific examples of present projects and plans include the following:

- ***Management and Restoration:*** *Vegetation Management Plan*, General Ecological Restoration, 2004 *Fire Management Plan/EIS*, Fuels reductions/forest rehabilitation projects (USFS), *Tuolumne Wild and Scenic River Comprehensive Management Plan*.

***Reasonably Foreseeable Future Actions***

Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on regional wildlife include:

- Changing demographics of visitors in Yosemite
- Climate change
- Comprehensive Transportation Plan
- Concessioner Parking Lot Restoration
- Restoration of the Mariposa Grove Ecosystem
- Yosemite National Park Annual Fire Management Plan (Operational Fire Management Plan)
- *Yosemite Wilderness Stewardship Plan/EIS*

Planned restoration projects listed above would generally contribute towards beneficial cumulative effects to special status species by increasing the quantity and quality of affected habitats. Cumulative adverse effects are related to increased facilities, access, and regional population growth as well as changes in climate. Facility-related projects would in many cases have local, adverse effects on fish and wildlife due to construction activities (short term) and the direct loss of habitat (long term). Increased population and visitation to the region over time would also contribute towards adverse effects. Regional population growth and visitation primarily affects regional wildlife populations through habitat loss and fragmentation due to new housing and infrastructure and use. Examples of construction- and human-use-related effects on wildlife patterns include direct displacement of wildlife (e.g., replaced with structures); introduction of nonnative species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment and materials, vehicles, grazing animals, or backyard gardening); fragmentation of habitats, which decreases genetic diversity; alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the

introduction of night light); and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). More importantly, some of the projects provide for increased residential growth adjacent to the park and would accommodate increased recreational development.

Changes in climate also pose a threat to several wildlife and fish. In particular, many amphibians would be affected by warming temperatures through increasing suitability for invasive competitors, pathogens, changes in hydrological patterns, and changes in snow pack and runoff. Many species would also be affected by increasing competition from other species (including invasives) as habitat for competitors becomes more suitable over time.

In total, regional development and growth could have a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. For species at higher elevations, the effects would somewhat be mitigated by resource protection planning and inherent spatial separation from impacts at lower elevation. In total, regional development and growth could have a net long-term, moderate, adverse effect on regional wildlife resources that would not be compensated by regional planning and restoration projects discussed above.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have had a mostly negative influence on wildlife and their habitats. Recent past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to habitat loss through development, regional population growth, and increased competition from nonnative species. Although general effects associated with Alternative 1 (No Action) would be negligible, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be regional, minor, adverse, and long term.

## ***Environmental Consequences of Actions Common to Alternatives 2–6***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Hydrologic/Geologic Resource Actions.** Specific restoration actions associated with hydrologic/geologic resources in all river segments and common to Alternatives 2-6 include removing 3,400 feet of riprap corridor-wide and revegetating with riparian plant species where needed. An additional 2,300 feet of riprap would be removed and replaced with bioengineered riverbank stabilization. Removal of riprap and replacement with bioengineered riverbank stabilization would allow for natural channel migration and promote riparian revegetation, and thus would have long-term, moderate, and beneficial impacts on wildlife corridorwide. Species that use riparian and riverine habitats would benefit the most from the removal of riprap and reestablishment of riparian habitat, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Because the removal of rip-rap and associated restoration actions involve heavy machinery, short-term, segmentwide, minor and adverse impacts associated with the restorative action may include noise associated with restoration activities, human presence, modification of habitat, and potential increase in sedimentation to the river. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, this restoration action would have moderate, beneficial impacts on wildlife in all river segments. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian vegetation reestablishes throughout the Merced River corridor.

Actions to protect and enhance river values common to Alternatives 2–6 include measures to improve hydrologic function and enhance ecological complexity throughout the Merced River corridor, restore the riverbanks and upland riparian communities, protect sensitive habitat areas, and minimize the risk of impacts on new and existing structures from flooding. The Merced River would be restored to natural river processes through the removal of riverbank riprap, revegetation of native plants, use of bioengineering techniques to stabilize riverbanks, removal of abandoned infrastructure within the river channel and meadow floodplains, and restoration of natural topography. The NPS would manage large woody debris according to the management plan, which allows for large wood to remain in the channel if it does not compromise visitor safety or infrastructure. In general, these actions would have a long-term, moderate, beneficial impact on fish and wildlife species that use the Merced River and its associated habitats.

In 1997 and 1998, surveys were conducted to examine the effects of riverbank restoration, with special attention to the presence of large woody debris and the association of fish with those areas. Rainbow trout density appeared higher at restoration sites, while the density of brown trout and Sacramento suckers was higher at the control sites (USFWS 1999). Implementation of these restoration actions would also improve hydrologic function, enhance natural stream dynamics, and increase ecological complexity of the river corridor and associated upland riparian habitat over the long term. Consequently, habitat quality would improve for terrestrial and aquatic wildlife species that use these intricately linked ecosystems.

Meadow and riparian habitat support numerous wildlife species and serve as a critical link between upland and aquatic habitats. Under Alternatives 2–6, the park would undertake certain measures to address ongoing upland and riparian habitat impacts. These measures include addressing informal trails and conifer encroachment into meadow areas through various restoration techniques, fencing and area closures, and providing visitor education and visual cues. Meadow and riparian habitats would be restored by revegetating denuded areas, protecting newly restored areas with fencing or natural barriers, installing signage to educate visitors, and developing or replacing trails and boardwalks to accommodate visitors while reducing vegetation trampling. Existing formal trails would be delineated and defined, and new development within 150 feet from the ordinary high-water mark of the Merced River would be prohibited. Facilities within 100 feet of the ordinary high-water mark would be removed or relocated to allow the floodplain to restore to natural conditions. Riverbank stabilization would be achieved with brush layering techniques and revegetation. These actions would have a moderate, long-term benefit on wildlife that use these habitat types.

Potential short-term, adverse impacts may also occur as a result of restoration actions, including disturbance associated with noise/vibrations from construction/restoration activities, temporary increases in suspended sediments, potential for accidental spill of chemicals, and modification to riverbank and channel habitat. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation where possible would reduce these short-term impacts to minor and adverse.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

As described above, corridor-wide, Alternatives 2-6 would prohibit new development within 150 feet from the ordinary high water mark of the Merced River and remove or relocate all campsites within 100 feet of the ordinary high water mark to allow for restoration activities. These actions would have long-term, moderate and beneficial effects upon wildlife associated with the Merced River and its habitats.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

As described for Alternative 1 (No Action), formal and informal trails in Segment 1 directly and/or indirectly affect habitats and associated wildlife in some areas. Heavy grazing by stock animals, vegetation trampling, soil compaction, and manure deposition adversely affect meadow habitat. For example, trampling and/or soil compaction of meadow habitat reduce habitat for voles, thereby reducing forage availability for California kingsnake. Alternatives 2-6 would include measures to restore and protect high-elevation meadows in Segment 1, such as prohibiting grazing at Merced Lake East Meadow and removing informal trails, trails through inundated areas, and trails that fragment meadow habitat. Denuded areas would be revegetated with native vegetation. Over time, these actions would have long-term, moderate, and beneficial impacts on wildlife species that use meadows, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with these actions may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting trails. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (trail construction and relocation) and over the long term, these management actions would have moderate, beneficial impacts on wildlife in Segment 1. Additionally, these actions would have a long-term, moderate, beneficial impact on fish because nonpoint sources of pollution (including sediments and nutrients) would be reduced or eliminated in localized areas of the watershed in Segment 1.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Alternatives 2–6 would provide for similar kinds of use that exist today in Segment 1, which focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Primary activities in Segment 1 include hiking and overnight backpacking at designated camping areas or dispersed wilderness camping. The retention of designated camping areas would vary by alternative. Stock day rides would be prohibited under Alternatives 2–6 in Segment 1. Adverse impacts from visitor activities would be mitigated through continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use. Actions to prohibit stock day rides and limit camping and travel to within maintained trails and roadways would result in long-term, minor, beneficial impacts on wildlife as human interactions and potential impacts related to stock use are reduced.

Private boating, with undesignated and dispersed put-ins and take-outs, would be allowed in all wild segments under Alternatives 2–6. Continued put-in and take-out activities in undesignated and dispersed locations in Segment 1 would result in continued long-term, local, negligible, adverse impacts on riverbanks from erosion and trampling of riparian vegetation. These activities would result in long-term, local, negligible, adverse impacts on riparian and riverine habitats and wildlife species that inhabit these areas.

Total visitor use levels for Segment 1 would vary with the overnight capacities and use levels across Alternatives 2–6. However, administrative use levels for this segment would remain the same across Alternatives 2–6. These administrative uses would continue to have a long-term, negligible effect on wildlife in Segment 1.

**Segment 2: Yosemite Valley***Impacts of Actions to Protect and Enhance River Values*

Restorative management actions that would occur in Segment 2 under Alternatives 2–6 include strategically placing large wood (log jams) to lessen the scouring from bridge structures, preventing riverbank erosion, restoring riparian habitat, and directing visitor use to resilient areas adjacent to the river. The free-flowing condition of the Merced River would be enhanced through the removal of former bridge footings and a river gauge base from the bed and banks of the river at the Happy Isles footbridge. The abandoned gauging station at the Pohono Bridge would also be removed and the riparian buffer would be restored to natural conditions. Water quality would be improved by relocating the Upper Pines Campground dump station. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-59**.

As summarized in table 9-59, approximately 151 acres of meadow, riparian, black oak woodland, coniferous forest, and floodplain habitats habitat would be restored in Segment 2 under Alternatives 2–6, resulting in direct benefits to fish and wildlife that use these habitat types. These actions would result in enhanced channel free flow, increased channel complexity, and restored riparian habitat segmentwide; in the long term, these impacts would be moderate and beneficial to



**TABLE 9-59: HABITAT RESTORATION COMMON TO ALTERNATIVES 2–6 IN SEGMENT 2**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed WHR Habitat Type	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Meadow	16	Meadow	18
Sparsely vegetated	2		
Black oak woodland	14	Black oak woodland	14
Coniferous forest	58	A mosaic of meadow, black oak, and open canopy coniferous forest	58
Coniferous forest	25	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	25
Development	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	32
Coniferous forest	32		
<b>Total</b>	<b>151</b>	<b>Total</b>	<b>151</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

aquatic and terrestrial wildlife. Short-term, adverse impacts resulting from these actions are expected to be localized, resulting from potential increase in suspended sediments caused by in-water restoration activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would ensure these short-term impacts would be minor and adverse.

Meadow habitat integrity, extent, and hydrological connectivity to the Merced River would be enhanced through constructing wide box culverts, formalizing or removing shoulder parking, restoring natural topography, removing ditches and abandoned infrastructure, improving roadways and trails, and removing encroaching conifers. In addition, the NPS would decompact soils and revegetate denuded meadow and riparian habitat. Stream headcutting at Bridalveil Meadow would be addressed by planting live willow cuttings to stabilize disturbed areas, riverbanks, and the adjacent meadow. These actions would result in local, short-term, adverse impacts on wildlife related to increased noise during restoration activities, human presence, and modification or conversion of habitats. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation where possible would reduce these short-term impacts to minor and adverse. Collectively, these restorative and management actions would be expected to have segmentwide, moderate, and beneficial impacts on fish and wildlife over the long term by enhancing habitat integrity, reducing habitat fragmentation, and improving water quality.

Actions that specifically target the enhancement of cultural values, including restoration of traditionally used plant populations, implementing the invasive plant management program, removing informal trails, and removing encroaching conifers that compete with black oaks, would also benefit wildlife species that depend on native vegetation and black oak woodlands. Thus, restorative actions to enhance cultural values would result in local, long-term, minor, beneficial impacts on wildlife associated with black oak woodlands and native vegetation.

#### **Biological Resource Actions.**

**Ahwahnee Meadow:** Actions common to Alternatives 2-6 to protect and enhance river values at the Ahwahnee Meadow include restoring an impacted portion of the Ahwahnee Meadow to natural meadow conditions and removing the tennis courts from black oak woodland. Currently disjunct portions of Ahwahnee Meadow would be reconnected by selectively removing conifers to return approximately 5.65 acres of meadow habitat. Enhancing meadow connectivity would reduce meadow fragmentation and removal of the tennis courts from black oak woodland would allow for woodland habitat to be restored. Natural meadow topography would be restored by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow species. Actions to restore Ahwahnee Meadow would have local, long-term, moderate, and beneficial impacts on wildlife due to an increased amount of meadow and oak woodland habitat, a reduction in habitat fragmentation, and enhanced habitat function (restored topography and hydrological connectivity).

**Yosemite Valley Campgrounds:** Common to Alternatives 2-6, the NPS would remove all campsites within 100 feet of the bed and banks of the Merced River in all Valley campgrounds and restore riparian habitat through the removal of asphalt parking spaces, base rock, and fill material. Soils would be decompacted and topography would be recontoured to natural conditions. Native riparian plant species would be used to revegetate denuded areas. Riparian habitat protection would be achieved through redirecting visitors to more stable and resilient areas, and installation of new fencing (or adjusting existing fencing) to protect newly restored riparian zones. Restoration of the 100 feet buffer of floodplain and riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

**El Capitan Meadow:** Common to Alternatives 2-6, the NPS would reroute the climber use trail at El Capitan to an appropriate upland area east of the current location to reduce impacts to El Capitan Meadow. Additionally, informal trails through meadow and oak woodland habitat would be removed and fencing or natural barriers and signs would be installed to keep visitors from trampling on native plants. Existing culverts would be replaced and additional culverts would be installed to improve water flow from at El Capitan to Northside Drive. Encroaching conifer saplings would be removed from El Capitan Meadow. Restoration of El Capitan Meadow would result in local, long-term, minor, and beneficial impacts on wildlife from reduction in trampling from foot traffic, increased hydrological connectivity, and reduced conifer encroachment into meadow habitat.

Additional actions common to Alternatives 2-6 in Yosemite Valley include formalizing parking and river access from the Pohono Bridge to the Diversion Dam, adding 150 feet of boardwalk to the west of the existing boardwalk at Sentinel Meadow, expanding fenced areas to protect wetlands on the north end of Stoneman Meadow near Lower Pines Campground, restoring 20 acres of floodplains at the western portion of former Lower Pines Campground, relocating parking from Devil's elbow to the

east of the current parking lot and delineating a formal trail to access the sandbar, focusing visitor use and river access at Housekeeping Camp to two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge, designating formal river access at Cathedral Beach Picnic Area and restoring riparian habitat, and filling approximately 2,155 feet of ditches throughout Valley meadows that are currently not serving current operational needs. Restoration of meadow and riparian habitats through the removal of invasive plant species and replanting with native vegetation, selective removal of conifers that cause meadow fragmentation, removal of abandoned park facilities and infrastructure (e.g., tennis court and abandoned irrigation lines), and filling of ditches that no longer serve operational needs would result in segment-wide, long-term, moderate, and beneficial impacts on wildlife. Species that use meadows, riparian, and riverine habitats would benefit the most from these actions, including mammals, reptiles, amphibians, many bird species, and fish.

Because some of the actions described above will require heavy equipment to achieve restoration objectives, local, short-term, minor, and adverse impacts associated with restorative actions would occur. Impacts include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of select conifers, and removal of nonnative vegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

**Hydrologic/Geologic Resource Actions.** Restoration actions associated with hydrologic/geologic resources within Segment 2 and common to Alternatives 2-6 include removing an abandoned gauging station within the bed and banks of the Merced River in the vicinity of Pohono Bridge, removing former footbridge (footings) and former river gauge base from the Merced River at the Happy Isles area, and constructing eight constructed logjams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Riparian restoration would follow after the removal of abandoned or antiquated infrastructure and features that restrict the free-flowing condition of the Merced River. Restoration of riparian habitat and enhancement of the free-flowing condition of the Merced River would have long-term, moderate, and beneficial impacts on wildlife in Yosemite Valley. Species that use riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish segment-wide as riparian habitat reestablish.

Short-term, adverse impacts associated with restorative actions common to Alternatives 2-6 may include noise associated with restoration activities, human presence, and modification of habitat as a result of revegetation and removal of infrastructure. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

**Cultural Resource Actions.** Specific actions to enhance cultural resources in Segment 2 and common to Alternatives 2-6 include removing campsite 208 and bear box from the East Valley Campground. Additionally, bathroom foot traffic at this campground would be rerouted away from the milling feature and the feature would be protected by fencing. The removal of campsite 208 and rerouting of foot traffic would have long-term, negligible, and beneficial impacts on wildlife. Short-term, local adverse impacts include noise associated with restoration activities and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

**Scenic Resource Actions.** Specific scenic resource actions in Segment 2 and common to Alternatives 2-6 include removing or selectively thinning conifers and in some cases burning undergrowth to maintain views within Yosemite Valley. Additionally, the NPS would selectively clear vegetation, remove invasive blackberry, restore grassland and oak habitat in the foreground to the view of El Capitan, repair riverbank erosion and thin conifers to open the view of Merced River in the vicinity of Clark's Bridge, and address informal trail use and vegetation trampling in the El Capitan area.

Tree size can be used as an indicator to determine habitat suitability for many species of wildlife, including raptors and other bird species as well as mammals. According to the CWHR System, trees with a diameter at breast height (DBH) measuring 6 to 11 inches are considered pole trees, trees measuring between 11 and 24 inches are considered small trees, and trees measuring greater than 24 inches are medium to large trees. Certain species, such as the California spotted owl, great gray owl, and long-eared owl, prefer dense mature forests with high canopy closure. The presence of black oaks in a mature forest setting is also beneficial to the California spotted owl as well as mule deer. Therefore, actions that affect large diameter trees or oaks are more likely to impact these species. The total maximum number of trees over 6 inches DBH that would be removed in Segment 2 across Alternatives 2 to 6 is summarized in **table 9-60**.

**TABLE 9-60: MAXIMUM NUMBER OF TREES REMOVED COMMON TO ALTERNATIVES 2–6 IN SEGMENT 2**

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Black Oak	1	1	5	0	0	0	0	<b>7</b>
Cedar	794	476	234	147	36	2	1	<b>1,690</b>
Douglas Fir	1	6	1	0	3	0	0	<b>11</b>
Dogwood	1	0	0	0	0	0	0	<b>1</b>
White Fir	49	33	34	15	5	1	0	<b>137</b>
Live Oak	7	3	0	0	0	0	0	<b>10</b>
Ponderosa	355	277	443	386	94	9	3	<b>1,567</b>
<b>Total</b>	<b>1,208</b>	<b>796</b>	<b>717</b>	<b>548</b>	<b>138</b>	<b>12</b>	<b>4</b>	<b>3,423</b>
SOURCE: NPS 2012b								

Specific actions that selectively remove trees smaller than 6 inches DBH occur at Cook's Meadow (south boardwalk), Stoneman Bridge, Devil's Elbow, Swinging Bridge, and the Vernal Fall foot bridge. Actions to selectively remove trees less than 6 inches in DBH would result in long-term, local, negligible, and adverse impacts on wildlife because seedlings, saplings, and pole trees generally provide lower habitat value for wildlife as compared to larger, mature trees with denser canopies.

Specific actions that remove primarily (50% or more) smaller trees measuring less than 20 inches DBH occur at the following locations: Ahwahnee Dining Room, Ahwahnee Solarium, Ahwahnee Lounge, Tunnel View, Southside Drive (Bridalveil approach via Roosevelt turnout), Valley View, Southside Drive at Roosevelt turnout, Bridalveil Fall hanging valley, Bridalveil Straight, Bridalveil Fall foot bridge, Sentinel Meadow boardwalk, Superintendent's Bridge, Hutching's View B, Chapel (Cook's and Sentinel Meadow area), Stoneman Meadow boardwalk, Happy Isles Bridge, El Capitan Meadow (east end 1), Southside Drive (Cathedral Spires turnout), Wosky Pond, Cathedral Beach at the El Capitan area, El Capitan Postage Stamp Scene, Four Mile Trailhead, Yosemite Falls View, and Lower Falls Bridge. The primary tree species that would be removed at the locations listed above include Cedar and Ponderosa pine. Because most trees removed are small in size, their contribution to wildlife habitat is not as significant as larger trees within a mature forest setting. Many terrestrial mammals, birds, and bat species prefer larger trees (sometimes with suitable cavities) for shelter, nesting, and foraging. Thus, the specific action to selectively remove conifers at the locations listed would result in local, long-term, and minor to negligible adverse impacts on wildlife.

Specific actions that remove primarily medium sized trees (50% or more trees are larger than 20 inches but less than 30 inches in DBH) occur at the Camp 6 Visitor Center benches. The removal of medium sized trees would result in local, long-term, and minor adverse impacts on wildlife. Medium sized trees (between 20 and 30 inches DBH) would provide habitat for many wildlife species, however, these trees are generally not large enough to support certain species that require mature forests, such as the California spotted owl.

Specific actions that remove primarily large trees (50% or more trees are greater than 30 inches DBH) occur at the following locations: Ahwahnee Meadow (at Peeling Domes), Bridalveil Fall footbridge, Curry Village Amphitheater, Curry Village Parking Area, Housekeeping Camp Bridge, Sentinel Beach, and Yosemite Lodge Portico. Removal of large trees measuring more than 30 inches in DBH would result in long-term, local, minor to moderate, and adverse impacts on wildlife, especially species that inhabit dense, mature forest habitats. The primary tree species that would be removed at the locations listed above include Cedar and Ponderosa pine.

In summary, specific scenic resource actions would remove approximately 3,423 trees, 59% of which would be small trees that measure less than 20 inches DBH. In addition, 20.5% of the total of trees removed would be medium in size (between 20 and 30 inches DBH), and 20.5% of the total of trees removed would be large or mature (more than 30 inches DBH). Only 4.5% of the total number of trees removed would be larger than 40 inches DBH.

The removal of trees less than 20 inches DBH would have a long-term, local, minor to negligible adverse impact on fish and wildlife. Some of the proposed tree removal, in addition to improving scenic views of iconic features of Yosemite Valley, would reduce conifer encroachment into meadow

and wetland habitats. Thus, species that use meadow, grassland, riparian, oak woodland, and riverine habitats may benefit from these actions. However, the removal of large trees, and especially trees measuring more than 30 inches DBH, would have local, long-term, minor to moderate adverse effects on wildlife species that rely on late-seral stage coniferous habitats for breeding and foraging.

In addition, these actions would result in short-term, adverse impacts associated with tree removal due to noise and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to negligible and adverse.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

The overall diversity of activities available to visitors in Yosemite Valley would remain consistent across Alternatives 2–6. Differences in alternatives consist of options for the enhancement, reduction or removal of facilities and services and related uses.

Actions common to Alternatives 2–6 to manage visitor use in Segment 2 include allowing private paddling, discontinuing several commercial services such as stock day rides and swimming pool operation, redesigning trails and boardwalks to improve pedestrian circulation, improving picnic areas, and creating an interpretive nature walk through Lower River Campground that emphasizes river-related natural processes. Some of these actions would result in short-term, local, minor, adverse impacts on wildlife as a result of trail construction and facility improvements, human presence, removal of vegetation, and ground disturbance. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. In the long term, removing vegetation to construct the interpretive trail would reduce habitat for wildlife locally; however, visitors would be educated on the natural river processes and what they can do to protect the river, vegetation communities, and wildlife habitat. Therefore, this action would result in a local, long-term, negligible impact on wildlife. Continued private paddling on the river in Segment 2 would result in continued long-term, minor, adverse impacts on localized areas of riverbanks, particularly at put-in and take-out locations. Reducing commercial services, such as stock day rides, would reduce impacts from stock use in riparian areas, thus effectively reducing the amount of vegetation trampling and erosion and sediment transport into the river over the long term in localized areas.

Actions to manage park facilities across Alternatives 2–6 in Yosemite Valley include the removal of a number of facilities in the Valley (e.g., the Boystown Housing area, Happy Isles Snack Stand, and the Curry Village Ice Rink). Actions that would remove and reduce facilities and services throughout the Valley would constitute a net reduction in total developed space in the park; combined with reductions in park visitor use at specific campgrounds, these management actions would reduce human disturbance to wildlife associated with the use of these facilities. Removal and restoration activities associated with these actions would result in short-term, local, adverse impacts on wildlife from construction-related noise and potential impacts on vegetation adjacent to the activity. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and



adverse. These actions would result in long-term, local, moderate, beneficial impacts on wildlife through reduction of human activities in the Valley, increased habitat for wildlife, and decreased potential for human-wildlife conflicts (especially with black bears).

Some park facilities and services would be retained or constructed, including the construction of new campsites and replacing temporary housing with permanent dormitories (e.g., permanent dormitories for park employees at Curry Village). Operation of current facilities and construction of new facilities would result in long-term, local, minor, adverse impacts on wildlife through human-related impacts (such as noise, human presence, trash, and food availability) and reduction in wildlife habitat. Habitat fragmentation and integrity may be affected, depending on the location of proposed new facilities.

Day parking capacity would vary by alternative in Segment 2. Additional parking would be added at Camp 6 across Alternatives 2–6; however, the amount would vary for each alternative. Actions to construct new parking would increase the total developed space in the park, increase human presence, and reduced habitat for wildlife. Thus, construction of new parking or expansion of existing parking lots would result in local, long-term, minor, adverse impacts on wildlife. In the short-term, adverse impacts on wildlife include construction-related activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), would mitigate these short-term impacts to minor and adverse.

Transportation-related actions in Yosemite Valley include removing some parking spaces and roadside parking, constructing a formal shuttle bus stop near Camp 4, and habitat restoration; these actions would result in short-term, local, minor, adverse impacts on wildlife. Adverse impacts include construction related noise and potential impacts on vegetation adjacent to the activity. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

**Camp 6 and Yosemite Village.** Actions in the Camp 6 and Yosemite Village areas that are common to Alternatives 2-6 include the relocation of visitor vehicle services and concessioner general office functions to other buildings and the removal of the existing garage structure and concessioner general office; and transportation actions that formalize parking and public movement in the Camp 6 and Village Sport Shop area.

Relocation of services and operations to other buildings would have no effect upon wildlife. Construction, activities associated with removing the existing garage structure and concessioner general office, as well as actions to formalize parking and public movement in the Camp 6 and Village Sport Shop area Camp 6 and Yosemite Village would result in direct, temporary and permanent losses of wildlife habitats and indirect effects related to construction activities. Direct losses of habitat are described in greater detail under each action alternative.

Outside of previously developed areas, impacts from these actions would occur primarily in ponderosa pine forest and, to a lesser extent, montane riparian habitats. Losses and disturbance to these wildlife habitats would occur through vegetation clearing, grading, site development, or other surface disturbance (e.g., driving over vegetation). Construction of new facilities may also require the removal of some trees, including the removal of mature conifer and hardwood trees, trees with cavities, and

snags. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. In addition, potentially affected wildlife habitats at Camp 6 and Yosemite Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction.

The use of heavy equipment may result in direct effects to wildlife through injuries or death, specifically for small wildlife, such as songbirds, burrowing mammals, reptiles and amphibians. The use of heavy construction equipment and increased human presence may also indirectly affect wildlife by causing some species to relocate or avoid the area during construction. Construction activities would generate noise and ground vibrations, visual disturbance, and other disturbances associated with human presence. Species mortality, loss of suitable habitat, and/or abandonment of breeding sites would have an adverse impact on wildlife. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

As part of these actions, informal parking along Sentinel Drive and several structures in the floodplain would also be removed. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, these restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. This action would result in a localized, long-term, minor, beneficial impact to wildlife in Segment 2.

**Yosemite Lodge & Camp 4.** Actions in the Yosemite Lodge and Camp 4 areas that are common to Alternatives 2-6 include the removal of temporary employee housing and the reconstruction of new housing. Under all alternatives, the NPS Volunteer Office (former Wellness Center), post office, swimming pool, and snack stand would all be removed, and the convenience shop and nature shop would be re-purposed.

As described for actions at Camp 6 and Yosemite Village, re-purposing facilities would have no effect on wildlife. Construction and removal activities at Yosemite Lodge and Camp 4 would result in direct temporary and permanent losses of wildlife habitats similar to those described for Camp 6 and Yosemite Village. These losses would occur through vegetation clearing, grading, or other surface disturbance (e.g., driving over vegetation) and would occur entirely in ponderosa pine forest, a dominant habitat type in Segment 2. In addition, the wildlife habitats at Yosemite Lodge and Camp 4 experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, for the same reasons discussed above for the Camp 6 and Yosemite Village area, actions that are common to Alternatives 2-6 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Restorative management actions that would occur in Segment 4 under Alternatives 2–6 that may affect wildlife include developing best management practices for revetment construction and repair. Currently

the river is confined by riprap and El Portal Road in Segment 4; to improve the free flow of the river, the park would use vertical walls wherever possible and provide the California Department of Transportation (CalTrans) with best management practice recommendations when repair or replacement is necessary in Segment 4. Other management actions that would enhance the free-flowing condition of the Merced River in Segments 3 and 4 include the removal of abandoned infrastructure and imported fill at the Cascades Picnic Area, Abbieville, and Trailer Village. Additionally, the NPS would restore the Greenemeyer sand pit to natural conditions. The Odger's fuel storage facility would be removed and the area restored. The types of habitat that would be affected by these restoration actions in Segment 4, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-61**.

**TABLE 9-61: HABITAT RESTORATION COMMON TO ALTERNATIVES 2–6 IN SEGMENT 4**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Foothill broadleaf woodland	1	Valley oak woodland	1
Lower montane needleleaf	11	Riparian & floodplain	11
<b>Total</b>	<b>12</b>	<b>Total</b>	<b>12</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

As summarized in table 9-61, approximately 12 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under all Alternatives 2–6, thus resulting in direct benefits to fish and wildlife that use these habitat types. These management actions would also result in local, short-term, adverse impacts, which may include noise associated with repair or replacement activities, human presence, modification of habitat, and temporary increase in suspended sediments. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, implementation of these actions would improve the free-flowing condition of the Merced River and reduce localized scouring. Thus, these actions would have long-term, local, moderate, beneficial impacts on fish and other aquatic wildlife.

**Biological Resource Actions.** Specific restoration actions to protect and enhance river values within Segment 4 and common to Alternatives 2-6 include removing development, asphalt and imported fill at Abbieville and the Trailer Village in West El Portal. The NPS would recontour and plant native riparian plant species and oaks within the 150-foot riparian buffer. Restoration of riparian habitat in the Abbieville and Trailer Village areas would result in local, long-term, minor, and beneficial impacts on wildlife within West El Portal (Segment 4). Species that use riparian and oak woodland habitats would benefit the most from this action. Additionally, this action would have a long-term, minor, local, beneficial impact on fish as riparian habitat is established. Short-term, adverse impacts include noise associated with restoration activities, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding

the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, this restoration action would have minor, beneficial impacts on wildlife in Segment 4.

**Scenic Resource Actions.** Scenic resource actions in Segment 3 and common to Alternatives 2-6 include selective removal of encroaching conifers at the Cascade Falls Viewpoint. Oak trees within this location would remain protected as an ethnographic ORV. The total maximum number of trees over 6 inches DBH that would be removed in Segment 3 across Alternatives 2 to 6 is summarized in table 9-62.

**TABLE 9-62: MAXIMUM NUMBER OF TREES REMOVED COMMON TO ALTERNATIVES 2–6 IN SEGMENT 3**

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Cedar	6	0	0	1	0	0	0	<b>7</b>
Live Oak	0	1	0	0	0	0	0	<b>1</b>
Ponderosa	1	1	1	0	0	0	0	<b>3</b>
Red Fir	3	0	0	0	0	0	0	<b>3</b>
<b>Total</b>	<b>10</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>
SOURCE: NPS 2012b								

As described previously in the Scenic Resource Actions under actions common to Alternatives 2-6 in Segment 2, tree DBH size provides information to determine which wildlife species may be supported by a particular ecosystem. Specific actions to selectively remove conifers in Segment 3 at the Cascade Falls Viewpoint would remove primarily (approximately 71%) smaller trees measuring less than 12 inches in DBH. Two large trees would be removed at Cascade Falls Viewpoint, including a Ponderosa pine (<30 inches DBH) and a cedar (<40 inches DBH). Because most trees removed are small in size, their contribution to wildlife habitat is not as significant as larger trees within a mature forest setting. Many terrestrial mammals, birds, and bat species prefer larger trees (sometimes with suitable cavities) for shelter, nesting, and foraging. Some tree removal, in addition to improving scenic views of features in Segment 3, would reduce conifer encroachment into meadow and wetland habitats. Thus, the specific action to selectively remove conifers at the Cascade Falls Viewpoint would result in local, long-term, and minor to negligible adverse impacts on wildlife. Short-term, adverse impacts associated with tree removal may include noise associated with restoration activities, human presence, and modification of habitat. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to negligible and adverse.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Visitor activities in Segments 3 and 4 primarily consist of scenic driving along Highway 140 enroute to Yosemite Valley, picnicking, rock-climbing, swimming, and fishing. Paddling activities would vary across Alternatives 2–6 in Segments 3 and 4. No overnight accommodations are provided in these

segments across Alternatives 2–6. An additional visitor restroom would be constructed in Old El Portal. Low-density employee housing would remain unchanged in Segment 3 and would increase in Segment 4 at El Portal Village Center. All housing redevelopment in this area will be outside the 100-year floodplain. All other redevelopment will be outside the 150-foot riparian buffer. An increase in housing and facilities development increases the total built environment in Segment 4. Although the additional housing units proposed at El Portal would be placed in nine vacant lots to infill the area, these developments would result in short-term impacts on wildlife from construction activities and human presence; in the long term, these actions would result in local, minor, adverse impacts on wildlife caused by increased disturbance from human presence and human-wildlife conflicts. Parking and public transportation would be consistent with actions proposed for Segment 2 and would apply throughout Alternatives 2–6.

Other visitor use management actions that would occur in Segment 3 under all Alternatives 2–6 that would potentially affect wildlife include selective removal of conifers that affect visitor views of Cascade Falls from El Portal Road. The removal, transport, and disposal of conifers, along with the subsequent restoration and monitoring associated with this work, would result in short- and long-term, local, adverse impacts, including noise associated with removal work, human presence, ground disturbance, removal of habitat, and potential sedimentation of adjacent aquatic habitat. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these impacts to minor and adverse. However, due to the selective removal of trees and abundance of similar habitat adjacent to removal sites, this measure would result in long-term, local, minor to negligible, and adverse impacts to wildlife species that depend on conifers for shelter and foraging.

## **Segments 5– 8: South Fork Merced River**

### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Specific restoration actions to protect and enhance river values within Segment 7 and common to Alternatives 2-6 include relocating two stock use campgrounds sites from the Wawona Stock Campground to the Wawona Stables. Actions common to Alternatives 2-6 to restore riparian and upland forested habitats at the Wawona Stock Campground in Segment 7 would have local, long-term, minor, and beneficial impacts on wildlife. Short-term, local, minor, and adverse impacts include noise associated with relocation activities and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, this restoration action would have minor, beneficial impacts on wildlife in Segment 7. Additionally, this action would have a long-term, minor to negligible, local, beneficial impact on fish as riparian habitat is established.

**Hydrologic/Geologic Resource Actions.** Restoration actions associated with hydrologic/geologic in Segment 6 and common to Alternatives 2-6 include retaining the current water collection and distribution system at the Wawona Impoundment and implementing the water conservation plan related to the minimum flow analysis for the South Fork Merced River. Keeping the current water

collection and distribution system would continue to reduce the flow of water during dry summer months. Additionally, the impoundment is located within the bed and banks of the river, which affect the free-flowing condition of the river. The excessive water withdrawals limit aquatic life within this segment of the Merced River. Thus, the action described above would have long-term, segmentwide, minor, and adverse impacts on wildlife, especially aquatic species that inhabit riverine habitat.

**Cultural Resource Actions.** Specific restoration actions related to cultural resources in Segment 7 and common to Alternatives 2-6 include removing 7 campsites from the Wawona Campground which currently cause potential impacts to the archeological site CA-MRP-168/329/H (Camp A.E. Wood). The removal of 7 campsites would increase wildlife habitat and reduce human presence at the Wawona Campground in Segment 7 and would have long-term, minor, and beneficial impacts on wildlife. Short-term, local, and adverse impacts include noise associated with restoration activities and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Restoration management actions to improve water quality of the South Fork Merced River include relocating the Wawona Campground dump station away from the river and delineating the boundaries of the South Fork Picnic Area. River access improvements, such as adding formal river access points, constructing pathways and staircase, and installing fencing, would guide visitor access to more resilient areas and prevent riverbank erosion. The types of habitat that would be affected by these actions in Segment 7, as well as the types of habitat that would be enhance or restored, are summarized in table 9-63.

**TABLE 9-63: HABITAT RESTORATION COMMON TO ALTERNATIVES 2–6 IN SEGMENT 7**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Coniferous forest	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
<b>Total</b>	<b>3</b>	<b>Total</b>	<b>3</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

As summarized in table 9-63, approximately three acres of riparian habitat would be restored in Segment 7 under Alternatives 2–6 as a result of moving improvements away from the riparian zone. These actions would result in short-term, local, minor, adverse impacts on wildlife during construction activities. In the long term, these actions would allow for designated river access while reducing vegetation trampling and erosion in riparian habitat. Thus, in the long term, these actions would provide a minor, local, beneficial impact to wildlife.



The Wawona Maintenance area currently extends to the riverbank and affects riparian habitat by soil compaction, storage of nonnative fill material, and storage of vehicles and other supplies. To reduce riparian impacts and restore the area, the park would remove staged materials, abandoned utilities, vehicles, and the parking lot from the riparian buffer and restore a 150-foot-wide area to natural conditions. This action would result in short-term, local, adverse impacts on wildlife associated with abandonment and restoration activities (i.e., noise, ground disturbance, and human presence). Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, the action would restore habitat and in the long-term would provide minor, local, beneficial impacts to terrestrial and aquatic wildlife that use riparian and riverine habitat.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Visitor use in wilderness areas above Wawona (Segment 5) would remain very low and river values would remain protected across Alternatives 2–6. Generally, visitor activities would consist of occasional overnight backpacking, day hiking, and stock-assisted pack trips. Parking for access to Segment 5 is through day parking in the Wawona area (in Segment 7). There are no employee housing and very limited administrative uses in Segment 5. Due to the low amount of visitor and administrative use in Segment 5, wildlife habitat would remain relatively intact and undisturbed. The amount, distribution, and integrity of wildlife habitat would remain relatively unchanged from current conditions. Actions to manage visitor use and facilities in Segment 5 would be expected to result in long-term, local, negligible, adverse impacts on wildlife.

Visitor use is not allowed in Segment 6 due to water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 6 and 8, with no resulting effects on wildlife.

Under Alternatives 2–6, the NPS would develop a wastewater collection system for the Wawona Campground to connect the facility to the existing wastewater treatment plant. The NPS would continue implementing the water conservation plan related to the minimum flow analysis for the South Fork Merced River and retain current water collection and distribution system associated with the Wawona Impoundment. Implementation of these actions would reduce water withdrawal rates and improve the free-flowing condition of the river and improve local water quality. While construction of the facility would result in local, short-term, minor, adverse impacts related to noise and human disturbance, these actions would result in a long-term, minor, local, beneficial impact on fish and other aquatic life as water quality is improved.

The NPS maintenance and administrative building complex would be redesigned and improved under Alternatives 2–6. Additional administrative facilities would be constructed. Employee housing capacity at the Wawona community or elsewhere outside of the Merced River corridor would remain unchanged. Regional bus service similar to that provided on the Highway 140 corridor would be introduced between Fresno and Yosemite Valley; existing bus service between Wawona and the Mariposa Grove and Wawona and Yosemite Valley would remain unchanged under Alternatives 2–6

but may expand under certain alternatives. The actions to manage visitor use, overnight accommodations, park facilities, employee housing, and public transportation would result in long-term, minor, adverse impacts on wildlife and their habitat. As previously discussed, human presence, recreational activities, and overnight lodging potentially affect wildlife by various means, including noise, traffic, introduction of human food, and impacts on riparian and riverine habitats.

Lastly, a redesign of the bus stop to accommodate visitor use in Wawona is proposed. In the short-term, wildlife and their associated habitat would be affected by construction activities, such as noise, ground disturbance, vegetation removal, and temporary increase in human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible, would reduce these short-term impacts to minor and adverse. Over the long-term, this action would have local, long-term, negligible, adverse impacts on wildlife.

### **Summary of Impacts Common to Alternatives 2–6**

Many of the actions common to Alternatives 2–6 would address existing adverse habitat trends for fish and wildlife. This includes actions that are targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the NPS would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. Toward these ends, the NPS would remove abandoned infrastructure in or adjacent to the Merced River, remove or relocate facilities that contribute to erosion/sedimentation/water quality issues, strategically place large woody debris within the channel, and use best management practices for revetment construction and repair throughout the river corridor. To restore meadow and riparian habitat, the NPS would remove informal trails and abandoned infrastructures, selectively remove encroaching conifers, improve trails that are unstable or traverse through meadow/wet habitats, restrict or manage the use of pack stock, revegetate denuded areas, and install fencing and visual cues to direct the public away from sensitive areas. When totaled, approximately 151 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, and floodplain habitat would be restored or enhanced under actions common to Alternatives 2–6. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river, enhance habitat complexity in riparian and aquatic zones, reduce human and pack-related disturbances, and reduce nonnative species and conifer intrusion into sensitive habitat. Adverse effects from these actions would primarily be associated with the active construction phase, and would be local, short term, and minor or negligible.

While there would be some long-term effects on wildlife associated with the movement and construction of new facilities, these impacts would be offset by the proposed restoration actions, resulting in a net beneficial impact on wildlife corridorwide. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced when compared to Alternative 1 (No Action). These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

## ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Merced Lake East Meadow near the Merced Lake Ranger Station has high levels of pack stock use, which contributes to lower vegetation cover and higher levels of bare ground. Under Alternatives 2, grazing would be permanently removed from the Merced Lake East Meadow. The park would require administrative pack stock passing through the Merced Lake area to rely on pellet feed that is packed into the site instead of allowing pack stock to graze in the meadow. This would help protect meadow vegetation from high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits. These actions would have local, minor beneficial impacts to fish and wildlife species over the long term.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions to manage visitor use and facilities in Segment 1 under Alternative 2 would largely have beneficial impacts on wildlife over the long term. Little Yosemite Valley Backpackers Camping Area would be converted to dispersed camping to reduce crowding and congestion, designated camping at Moraine Dome Camping Area would be discontinued, and the Merced Lake High Sierra Camp would be closed (to allow for expansion of designated camping from Merced Lake Backpackers Camping Area into the existing footprint), and the flush toilet and water system would be replaced by a composter. The actions listed above would result in less human disturbance and enhanced wilderness character of these camping areas, including approximately 11 acres of meadow and subalpine restoration in these areas. Although dispersed camping may increase the chance of human/mountain lion encounters, which are more common when human use is dispersed (Beier 1991), dispersed camping would also reduce adverse impacts that are associated with concentrated human use, including noise and traffic congestion, heavy vegetation trampling and soil compaction, and the attraction of both native and nonnative wildlife scavenging for human food. Wildlife would also benefit from the overall reduction of the built environment, increase in habitat availability, and enhanced habitat quality.

Actions related to the conversion or removal of facilities, including converting Little Yosemite Valley Backpackers Camping Area and Moraine Dome Campground to dispersed camping and removing infrastructure that is incompatible with wilderness character (such as composting toilets, bear boxes, and other supporting infrastructures) and closing Merced Lake High Sierra Camp and restoring the area to natural conditions, would result in short-term, adverse impacts but long-term, beneficial impacts. Construction activities, including the demolition and removal of existing improvements, would result in short-term, local, adverse impacts on wildlife related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long term, these actions are expected to reduce human-related impacts on wildlife and habitats, thus resulting in local, minor, beneficial impacts on wildlife.

In summary, total daily use levels in Segment 1 under Alternative 2 would be reduced. This reduction in overnight facilities and overnight visitors represents a reduction in human presence, human-related pressures on wildlife, and reduced future impacts on fish and wildlife habitat in localized areas of Segment 1. Collectively, actions to manage visitor use and facilities under Alternative 2 would result in long-term, local, minor, beneficial impacts on fish and wildlife in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 2 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and the expansion of dispersed camping at Merced Lake Backpackers Camping Area into the High Sierra Camp footprint. As described above, construction activities associated with the demolition and removal of the Merced Lake High Sierra Camp would result in short-term, local, adverse impacts on wildlife related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Once completed, these actions would result in a local, long-term, minor, beneficial impact on fish and wildlife in Segment 1 by reducing stresses related to concentrated human use.

**Segment 1 Impact Summary:** Actions to restore river values and manage visitor use and facilities within Segment 1 would have local, long-term, minor, beneficial impacts on fish and wildlife.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Alternative 2 proposes substantial restoration actions in Segment 2 that would directly benefit fish and wildlife in the Merced River corridor over the long term. To enhance the free-flow character of the Merced River, address river widening issues, and increase river complexity, the NPS would remove bridges (Ahwahnee, Sugar Pine, and Stoneman bridges) and restore these areas to natural conditions; reroute or redesign trails and roadways; and construct constructed logjams in the river channel between Clark's and Sentinel bridges to enhance river complexity. These actions would directly benefit fish and wildlife associated with the aquatic habitats of the Merced River. Water quality in the river would also be improved by relocating parking lots, rerouting roads, removing fill material, and removing pack stock trails and associated Curry Village stables outside of the floodplain, and restoring meadow and floodplain ecosystems. Formalizing some areas for parking and river access and restricting parking and river access in other sensitive areas would benefit both riparian habitat establishment and water quality. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-64**.

As summarized in **table 9-64**, approximately 271 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored in Segment 2 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit the most from actions that remove overnight facilities and associated infrastructure (riprap, asphalt pads, trails) from the floodplain, including

**TABLE 9-64: ALTERNATIVE 2 HABITAT RESTORATION IN SEGMENT 2**

Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Barren	0	Meadow	20
Meadow	18		
Sparsely vegetated	2		
Lower montane broadleaf	16	Lower montane broadleaf	16
Lower montane needleleaf	75	A mosaic of meadow, black oak, and open canopy coniferous forest	75
Barren	9	Riparian & floodplain	152
Lower montane broadleaf	1		
Lower montane needleleaf	142		
Lower montane needleleaf	8	Riparian	8
<b>Total</b>	<b>271</b>	<b>Total</b>	<b>271</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

selective campgrounds in Yosemite Valley, the former Upper and Lower Pines campgrounds, Housekeeping Camp, and Yosemite Lodge. Restoration of these areas and former campgrounds (e.g., former Upper and Lower Rivers Campgrounds) would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function in the 2-year to 10-year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These actions would therefore have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife. Like other restoration actions, these actions would also have short-term, adverse impacts on wildlife related to noise, human presence, and potential impacts on water quality during construction; adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), would reduce these short-term impacts to minor and adverse.

To increase the frequency of inundation in the riparian zone, meadows, and floodplain in the vicinity of El Capitan moraine, the park would mitigate for the removal of the terminal moraine through placement of large wood loading upstream of El Capitan moraine to Sentinel picnic area and constructed logjams in the channel. This would effectively restore water to meadows during high water events. This restorative action would result in local, short-term, adverse impacts on fish and wildlife, including noise associated with construction-related activities; ground disturbance; human presence; increases in sedimentation; and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, this action would also restore the 100-year floodplain and associated plant communities (meadows and riparian habitat), improve hydrological

connectivity of these communities to the river, and improve primary food production for fish. Thus, this restoration action would have a segmentwide, long-term, moderate, beneficial impact on fish and other aquatic species that use the Merced River and adjacent riparian habitat.

Under Alternative 2, the NPS would implement measures to restore and protect meadow and wetland habitat while providing adequate access to visitors. Currently, the location of some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove and reroute trails outside of meadows and wetlands, consolidate trails where possible, and restore meadow contours and native vegetation. All informal trails would be removed and roadside parking would be reduced through alternative striping and consolidated parking where possible. Housing between the Yosemite Village Store and Ahwahnee Meadow would be removed and the area recontoured to historical topography; soils and native vegetation would be restored. The park would use restoration fencing to designate appropriate meadow access points and guide visitors toward boardwalks and viewing platforms to protect meadow habitat. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats, resulting in long-term benefits to wildlife that use these meadow systems.

Collectively, restoration actions proposed in Segment 2 under Alternative 2 would result in local, minor, short-term, adverse impacts on wildlife during construction but substantial long-term benefits. Potential minor, adverse impacts include noise related to restoration/removal activities, human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these actions would also enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection; enhancing channel free flow; and increasing channel complexity. Thus, when combined, the actions would result in segmentwide, long-term, moderate, beneficial impact on fish and wildlife that use these habitats, as habitat quality, quantity, and integrity are substantially improved and habitat disturbance is substantially decreased in Segment 2.

### **Biological Resource Actions.**

***Yosemite Valley Campgrounds:*** Under Alternative 2, specific restoration actions to enhance the river's biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 25.1 acres of floodplain/riparian habitat, and removing all informal trails and reducing roadside parking at El Capitan Meadow. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6, the NPS would remove all informal trails and reduce roadside parking through alternative striping and consolidate parking to the west end of the meadow to reduce impacts to El Capitan Meadow. Restoration of El Capitan Meadow



and elimination of roadside parking adjacent to the meadow would result in local, long-term, minor, and beneficial impacts on wildlife from reduction in trampling from foot traffic and impacts to meadow habitat associated with roadside parking.

**Ahwahnee Meadow:** Specific actions under Alternative 2 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible, removing 900 feet of Northside Drive and relocating the bike path to the south of Ahwahnee Meadow, and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

**Stoneman Meadow:** Under Alternative 2, the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through the Boys Town area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275'). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on meadow wildlife.

**Former Upper and Lower Rivers Campgrounds:** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 2 include restoring 30 acres of the 10-year floodplain. Under Alternative 2, the park would remove the remaining asphalt, decompact soils of former roads and campsites, and re-establish seasonal channels and natural topography that have been filled. Additionally, the park would remove the Lower River amphitheater structure and fill. Following habitat restoration, temporary fencing would be installed to protect the restoration areas and to allow for recovery. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 2 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

**Hydrologic/Geologic Resource Actions.** Under Alternative 2, restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, removing the Stoneman, Ahwahnee, and Sugar Pine Bridges to enhance the free-flowing condition of the Merced River. Additionally, fill material would be removed and meadow and floodplain habitats would be restored. Southside Drive would be converted to a two-way road and the Sentinel intersection would be redesigned. Restoration of meadow, riparian and floodplain habitats and the removal or relocation of infrastructure that constrict the free-flowing condition of the river or are located in sensitive areas under Alternative 2 would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that use meadow, riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 2 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (bridge removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

In addition to actions that are common to Alternatives 2–6, Alternative 2 would limit boating activities in Segment 2, remove the Curry Village stables and the Yosemite Lodge bicycle stand, and repurpose several park facilities. Some visitor amenities such as the Housekeeping Camp laundry, shower houses and restrooms, and grocery store would also be removed. Additionally, employee temporary housing at Curry Village would be removed and permanent housing would be constructed. Temporary housing at the Lost Arrow parking lot would be removed and parking spaces would be reestablished. Although some development would occur under Alternative 2, these actions in combination with restorative and management actions would result in minor, beneficial impacts on wildlife in localized areas of Segment 2.

Under Alternative 2 wayfinding between Happy Isles and the Mist Trail from the shuttle stop would be improved. Because inadequate wayfinding contributes to vegetation trampling, thus causing a large area of denuded vegetation in this area, improving wayfinding for visitors would facilitate for vegetation reestablishment over time. In the long term, this action would result in local, minor, beneficial impacts on wildlife by protecting riparian vegetation.

Actions to reduce visitor overnight capacities in the Valley, including the Housekeeping Camp, Yosemite Lodge, Curry Village, Backpacker's Campground, Upper Pines Campground, and North Pines Campground, would result in beneficial impacts on wildlife as human interactions and impacts are reduced. In addition, visitor day parking would be reduced and the Curry Orchard day parking area would be formalized. These actions are expected to have long-term, minor, beneficial impacts on wildlife

in Segment 2 with the restoration of Stoneman Meadow and additional formal accommodation for parking in the Valley; visitors would be less likely to park in undesignated areas and affect meadow and other habitats.

**Curry Village & Campgrounds.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Curry Village include the construction of 78 hard-sided units at Boys Town. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (see **table 9-65**). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow habitat. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-65 below, only a small percentage of these wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, the wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts and disturbance. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-65: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 2**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

The use of heavy equipment during construction within ponderosa pine and wet meadow habitats may result in injuries or death to some species of wildlife, as described for actions common to Alternatives 2-6. Construction activities would also generate noise and increases in human presence, which may cause wildlife to relocate or avoid the area. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

**Camp 6 and Yosemite Village.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center Parking Area

would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and out of the dynamic 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems.

As noted in **table 9-66**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses of montane riparian and ponderosa pine forest habitat types. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-66, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-66: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 2**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Riparian	1.37	0.4%
Ponderosa Pine	9.03	0.5%
Redevelopment <sup>b</sup>	11.55	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction actions under Alternative 2 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

The rerouting of Northside Drive outside the 10-year floodplain at Camp 6 would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, moderate, beneficial impact on wildlife in Segment 2.

**Yosemite Lodge and Camp 4.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the conversion of Yosemite Lodge to a day-use facility and the addition of 250 parking spaces; redevelopment west of Yosemite Lodge to provide

an additional 150 day use parking spaces and area for 15 tour buses; the removal of old and temporary housing at Highland Court and the Thousands Cabins; the conversion of Highland Court to a walk-in campground; and the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts. The conversion of Yosemite Lodge to a day-use facility and the conversion of Highland Court to a walk-in campground would have a negligible effect on wildlife.

Like other proposed facility projects, construction activities at Yosemite Lodge and Camp 4 would result in direct temporary and permanent losses of wildlife habitats as well as redevelopment of existing disturbed areas (table 9-67). Impacts to wildlife habitats would occur entirely in ponderosa pine forest. This is a dominant habitat type in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-67, only a small percentage of this vegetation community would be impacted. In addition, potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-67: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 2**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	0.57	<0.1%
Ponderosa Pine	14.90	0.8%
Wet Meadow	0.12	<0.1%
Redevelopment <sup>b</sup>	3.69	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 2 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, reducing total daily visitor use by approximately 33%, total day visitors by 36%, and total overnight visitors by 26% in Yosemite Valley would result in a corresponding reduction in human-related impacts on wildlife, especially during the peak season (summer). It is likely that as visitor use is reduced and habitat is restored, the range of some species, including birds, amphibians, and mammals in particular, may expand into areas as they become more suitable for occupation. As summarized in table 9-68, actions to manage visitor use and facilities would result in the loss of approximately 32.37 acres of wildlife habitat primarily located near previously developed areas, resulting in a long-term, local, minor, adverse impacts to wildlife.

**TABLE 9-68: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 2**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	0.57	<0.1%
Montane Riparian	1.37	0.4%
Ponderosa Pine	30.28	1.7%
Wet Meadow	0.15	<0.1%
Redevelopment <sup>b</sup>	17.21	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Facility removal and new construction actions would also result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of approximately 271 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of approximately 32.37 acres of wildlife habitat primarily located near previously developed areas, resulting in a long-term, local, minor, adverse impact to wildlife.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

In addition to the actions common to Alternatives 2–6, the NPS would designate oak protection areas in the Odgers' fuel transfer center and parking lots adjacent to this area, thereby benefiting wildlife that use oak woodland habitats. New parking and building construction would be prohibited in the oak protection area. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore the area, thereby enhancing riparian and oak woodland habitats. Habitat that would be affected by these restoration actions would be in Segment 4, as summarized in **table 9-69**.

As summarized in **table 9-69**, approximately 13 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. While these actions would result in local, short-term, negligible, adverse impacts on wildlife during



**TABLE 9-69: ALTERNATIVE 2 HABITAT RESTORATION IN SEGMENT 4**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Foothill broadleaf woodland	2	Valley oak woodland	2
Sparsely vegetated	2	Riparian & floodplain	11
Lower montane broadleaf	9		
<b>Total</b>	<b>13</b>	<b>Total</b>	<b>13</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

restoration activities due to increased noise and human presence, in the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees and riparian habitat for habitat and food.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

In Segment 3, Alternative 2 would provide for similar kinds and amounts of visitor use that exists today. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under this alternative. River-related recreational activities, administrative activities, total day visitors, and parking/transportation activities would remain largely unchanged from today, and impacts on wildlife would be the same as that described for Alternative 1 (No Action).

In Segment 4, the kinds and amounts of use under Alternative 2 would be similar to today, including private boating, day visitors, and pass-through traffic. Visitor use would make up a minority of the use in Segment 4, although visitor pass-through traffic would be high during the peak summer season; therefore, impacts related to visitor use would be the same as described for Alternative 1.

Under Alternative 2, user capacity would mostly be affected by the increase in employee housing at El Portal. Under Alternative 2, NPS employee housing would be added to the El Portal village center and Rancheria Flat; employee parking would be added at these locations to accommodate the increase in employee housing. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal would be a function of the decrease in employee housing capacity in Yosemite Valley (Segment 2). As previously discussed in the “Environmental Consequences of Actions Common to Alternatives 2–6,” the addition of employee housing and park facilities development would increase the total built environment in Segment 4. Housing development at El Portal and Rancheria Flat would be expected to result in short-term impacts on wildlife from construction activities and human presence; while in the long-term, these actions would result in local, minor, adverse impacts on wildlife caused by increased disturbance from human presence and removal of habitat.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 13 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

### Segments 5– 8: South Fork Merced River

#### *Impacts of Actions to Protect and Enhance River Values*

In addition to the impacts described under “Environmental Consequences of Actions Common to Alternatives 2–6,” actions specifically targeted to protect culturally sensitive areas would benefit wildlife as well, including the relocation or removal of campsites, stock campground sites that are in the 100-year floodplain or culturally sensitive areas. Actions to remove or relocate facilities would also result in habitat restoration in Segment 7; in particular, the removal of the Wawona Golf Course and the Wawona Hotel tennis courts and relocation of some campsites at the Wawona Campgrounds and Wawona stock camp would result in additional wet meadow and riparian habitat restoration. Most habitat that would be affected by these restoration actions is in Segment 7, as summarized in **table 9-70**.

**TABLE 9-70: ALTERNATIVE 2 HABITAT RESTORATION IN SEGMENT 7**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced ) <sup>b</sup>
Barren	40	Meadow	40
Lower montane needleleaf	3	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Lower montane needleleaf	9	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	9
<b>Total</b>	<b>52</b>	<b>Total</b>	<b>52</b>
<sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-70, approximately 52 acres of riparian, floodplain, and meadow habitats would be restored in Segment 7 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The removal of the Wawona Golf Course and Wawona Hotel tennis courts, along with the removal of select campsites in the floodplain would result in local, long-term, moderate, beneficial impacts on wildlife as meadow and riparian habitat are restored and wildlife are subject to less human presence and human-related pressures.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 2 would result in similar kinds and amounts of use that exist today in Segment 5. Due to the low amount of visitor and administrative use in Segment 5, the amount, distribution, and integrity of wildlife habitat would remain relatively unchanged from current conditions under Alternative 2, and impacts would be the same as described for Alternative 1 (No Action).

Visitor use is not allowed in Segment 6 due to water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 6 and 8, and would be the same under Alternative 2 as described for Alternative 1.

Within Segment 7, Alternative 2 would provide for reduced kinds and amounts of use compared to those that exist today to accommodate for higher levels of river restoration activity. Only private boating would be allowed, and boaters would be able to use designated put-in and take-out locations. The Wawona Golf Course and tennis courts would be removed to accommodate ecological restoration. Overnight capacities would remain unchanged from today for the Wawona Hotel; however, the Wawona Campground and Wawona stock camp would experience a reduction or relocation in campsites. Removal of campsites and park facilities would result in short-term, adverse impacts on fish and wildlife during construction, including noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to immediate areas of the Merced River. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, the removal of the Wawona Golf Course and tennis courts would reduce the built environment and increase the quantity of wildlife habitat in Wawona following restoration. Thus, in the long term, implementation of restorative actions following facility demolition would restore riparian and meadow habitat, reduce riverbank erosion, and result in local, long-term, moderate, beneficial impacts on aquatic and terrestrial wildlife.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 32 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 2 would result in the restoration of 52 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Many of the Alternative 2 actions would improve habitat conditions for fish and wildlife. This includes actions that are targeted to improve habitat quantity and quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments

and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 347 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 2, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions the park would implement that would directly benefit fish and wildlife under Alternative 2 include the following:

- Remove facilities within the 100-year floodplain of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Place restrictions on recreational access points to rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 32.37 acres of wildlife habitats under Alternative 2. Potential adverse effects from these actions would primarily be associated with the active construction or restoration phase and would be local, short term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced. These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Cumulative impacts on wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with Alternative 2 actions. The past, present, and reasonably foreseeable actions used for this evaluation are the same projects listed for Alternative 1 (No action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. Like those actions described for Alternatives 2–6, the actions with Alternative 2 under the Merced River Plan would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types are most likely to be affected cumulatively by actions proposed under Alternative 2.

Past actions have degraded and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations from development and resource extraction, have resulted in changed fish and wildlife movement patterns over time as they seek areas with more suitable habitat conditions. Present and reasonably foreseeable future actions also have the potential to further reduce the extent or quality of these habitat types; however, potential effects to these habitat types are generally mitigated and/or compensated through habitat preservation and/or enhancement at an off-site location (including mitigation banks). These actions provide the most benefit when coordinated with larger, regional conservation strategies that protect intact corridors or provide links to other areas of suitable habitat. Because the actions proposed for Alternative 2 would further increase the habitat value of the Merced River corridor, it would contribute towards a long-term, cumulative, beneficial effect on fish and wildlife and may, in some cases, reverse local population declines for some species. Songbirds, reptiles, and amphibians in particular would benefit cumulatively from Alternative 2 because the quantity of preferred habitat (meadows and riparian) would see a net increase.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 3, preliminary grazing capacities for the Merced Lake East Meadow would be developed. When the meadow recovers, administrative grazing at established capacities would be allowed. The meadow would be monitored annually for five years, and use levels would be adapted as needed. This adaptive management of grazing in the meadow would help protect meadow vegetation from the effects of high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits, and would benefit habitat connectivity and meadow hydrology. These actions would result in long-term, local, minor beneficial impacts to fish and wildlife.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Like Alternative 2, Alternative 3 would reduce the amount of infrastructure and visitor use in Segment 1. While many of these actions would be similar to those described for Alternative 2, residual use (and correspondingly, human presence) would be higher with Alternative 3 than Alternative 2 but lower than current conditions. The Merced Lake High Sierra Camp would also be converted to a temporary outfitter camp to accommodate 15 people per night. Instead of dispersed camping, designated camping at Little Yosemite Valley would be reduced and the Merced Lake Backpackers Campground would be expanded into a portion of the former High Sierra Camping Area. Moraine Dome Camping Area would remain. Overall, wilderness zone capacities would be reduced from 150 to 75. These actions would have a local, minor, beneficial impact on wildlife over the long term as impacts related to visitor use are reduced, as described for Alternative 2.

Construction activities related to the removal of existing improvements with Alternative 3 would result in local, short-term, adverse impacts on wildlife, including noise related to removal of infrastructure

and human presence. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, over the long term, these actions would improve habitat quality and quantity, thus resulting in local, minor, beneficial impacts in wildlife.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 3 involve the conversion of the area to designated Wilderness, removal of all infrastructure from the Merced Lake High Sierra Camp, and use of the former camp area as a temporary stock camp, resulting in approximately 11 acres of meadow and subalpine restoration in these areas. As discussed for Alternative 2, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Segment 1 by reducing stresses on wildlife from concentrated visitor use.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 3 would have local, long-term, minor, beneficial impacts on wildlife.

## **Segment 2: Yosemite Valley**

### *Impacts of Actions to Protect and Enhance River Values*

Like Alternative 2, Alternative 3 would restore meadow, riparian and floodplain habitats and enhance the free flowing condition of the Merced River through the removal or relocation of infrastructure that constrict the natural channel migration. Alternative 3 would also improve water quality by relocating parking lots, rerouting roads, removing fill material, removing pack stock trails and associated Curry Village stables outside of the floodplain, and restoring meadow and floodplain ecosystems. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-71**.

As summarized in **table 9-71**, a total of 230 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit the most from actions that remove overnight facilities and associated infrastructure (riprap, asphalt pads, trails) within a 150-foot buffer of the river, including selective campgrounds in Yosemite Valley, the former Upper and Lower Pines campgrounds, Housekeeping Camp, and the removal of four buildings at Yosemite Lodge. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the 2-year to 10-year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These actions would have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife.

Restoration actions and effects on wildlife associated with the removal of Ahwahnee, Sugar Pine, and Stoneman bridges, restoration of Ahwahnee Meadow, Stoneman Meadow and Curry Orchard parking lot, Housekeeping Camp, El Capitan moraine, restoration of the area formerly occupied by the



**TABLE 9-71: ALTERNATIVE 3 HABITAT RESTORATION IN SEGMENT 2**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed Future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Barren	2	Meadow	21
Meadow	17		
Sparsely vegetated	2		
Lower montane broadleaf	16	Lower montane broadleaf	16
Lower montane needleleaf	68	A mosaic of meadow, black oak, and open canopy coniferous forest	68
Barren	7	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	105
Lower montane broadleaf	1		
Lower montane needleleaf	97		
Lower montane needleleaf	20	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	20
<b>Total</b>	<b>230</b>	<b>Total</b>	<b>230</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

Upper River and Lower River campgrounds, and rerouting of Valley Loop Trail would be the same as described for Alternative 2. While somewhat less habitat would be restored overall by Alternative 3 when compared to Alternative 2, these actions would nonetheless improve the quality and quantity of meadow and riparian habitats, thereby having a long-term, beneficial effect on the wildlife that use these habitat types when compared to Alternative 1 (No Action).

Species that use meadow, riparian, and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 2 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (bridge removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Under Alternative 3, the NPS would implement measures to restore and protect meadow and wetland habitat while providing adequate access to visitors, including specific measures to restore El Capitan Meadow. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats.

As discussed for other alternatives, these restoration actions would result in local, short-term, minor, adverse impacts on wildlife during the construction phase. Potential minor, adverse impacts include noise related to restoration/removal activities, human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection and enhancing channel free flow and increase channel complexity. Thus, when combined, the actions would result in segmentwide, long-term, moderate, beneficial impact on wildlife that use riparian and wetland habitats, as habitat quality, quantity, and integrity are substantially improved and habitat disturbance is substantially decreased in Segment 2.

#### **Biological Resource Actions.**

***Yosemite Valley Campgrounds:*** Under Alternative 3, specific restoration actions to enhance the river's biological values in Segment 2 include removing all campsites within 150 feet of the bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6, the NPS would use restoration fencing and signing to designate appropriate meadow access points, remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation.

***Ahwahnee Meadow:*** Similar to Alternative 2, specific actions under Alternative 3 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible, removing 900 feet of Northside Drive and relocating the bike path to the south of Ahwahnee Meadow, and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

***Stoneman Meadow:*** Like Alternative 2, under Alternative 3 the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boystown area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote

water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275 feet). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on meadow wildlife.

**Former Upper and Lower Rivers Campgrounds:** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 3 are similar to Alternative 2, which include restoring 30 acres of the 10-year floodplain. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 3 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific restoration actions associated with hydrologic/geologic resources in Segment 2 under Alternative 3 is the same as Alternative 2, which include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, and removing the Stoneman, Ahwahnee, and Sugar Pine Bridges to enhance the free-flowing condition of the Merced River. Additionally, fill material would be removed and meadow and floodplain habitats would be restored. Southside Drive would be converted to a two-way road and the Sentinel intersection would be redesigned.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 3 would substantially reduce the maximum daily visitation allowed in Segment 2 from current levels to allow for increased resource restoration and reduce crowding and congestion. Under Alternative 3, recreational activities would be reduced to allow for increased restoration along the river corridor. Beneficial effects on wildlife associated with reduced visitor use with this alternative would be similar to that described for Alternative 2.

Similarly to Alternative 2, employee temporary housing at Curry Village would be removed and permanent housing would be constructed under Alternative 3. Temporary housing at the Lost Arrow parking lot would be replaced by parking spaces. Camping opportunities would be reduced under Alternative 3 in Segment 2 when compared to current levels, from 477 sites to 466 sites. Reduction or removal in camping and lodging accommodations would occur at Lower and North Pines

campgrounds, Curry Village, Yosemite Lodge, Backpackers Campground (remove 25 sites and partially replace 16 sites outside of the 100-year floodplain), and Housekeeping Camp. Additional camping opportunities would be expanded at the Upper Pines Campground (recreational vehicle [RV] area), west of Backpackers Campground, and new sites near Camp 4 (Sunnyside Campground). These additional camping opportunities would have a negligible effect on wildlife because the campsites would be located in less sensitive habitats than those sites being removed. However, the removal of campgrounds at Backpackers Campground, North Pines Campground, and Lower Pines Campground would reduce human presence and human-related impacts on wildlife within the Merced River corridor, resulting in segmentwide, long-term, moderate, beneficial effects.

Day parking would be reduced from current supply. This reduction would be most prominent at Camp 6, Curry Orchard, and many formal and informal roadside parking areas. To compensate for the loss of parking, new parking spaces would be added to the west of the current Yosemite Lodge parking lot. These actions would occur in existing disturbed areas and would not result in adverse effects on wildlife. Over the long term, the removal of both formal and informal parking areas would have local, minor, beneficial impacts on wildlife.

**Curry Village & Campgrounds.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village and the rerouting of South Side Drive at Boys Town. Construction activities at Curry Village would result in direct temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (table 9-72). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-72 below, only a small percentage of the affected wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-72: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 3**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

**Camp 6 and Yosemite Village.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center Parking Area would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and north of the 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems.

As noted in **table 9-73**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses of montane riparian and ponderosa pine forest habitat types. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-73**, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction activities under Alternative 3 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

**TABLE 9-73: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 3**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Riparian	1.37	0.4%
Ponderosa Pine	9.03	0.5%
Redevelopment <sup>b</sup>	11.55	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

The rerouting of Northside Drive outside the 10-year floodplain would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, moderate, beneficial impact on wildlife in Segment 2.

**Yosemite Lodge and Camp 4.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (table 9-74). Impacts to wildlife habitats would occur entirely in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-74, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-74: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 3**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	0.08	<0.1%
Ponderosa Pine	14.80	0.8%
Redevelopment <sup>b</sup>	3.69	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 3 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.



In summary, as shown in table 9-75, actions to manage visitor use and facilities would result in the loss of 31.66 acres of wildlife habitats primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts wildlife.

**TABLE 9-75: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES – ALTERNATIVE 3**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	0.08	<0.1%
Montane Riparian	1.37	0.4%
Ponderosa Pine	30.18	1.7%
Wet Meadow	0.03	<0.1%
Redevelopment <sup>b</sup>	17.21	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Alternative 3 would also result in a net 37% reduction in total daily visitor use (also a reduction of 43% in total day visitors and 23% total overnight visitors) when compared to current levels, resulting in long-term benefits to wildlife and their habitat. As described for Alternative 2, this reduction in visitor use would significantly reduce human-related impacts on wildlife and their associated habitats throughout the Valley. Actions to significantly reduce overnight capacities would effectively reduce the built environment and human presence in the Valley. Restoration of habitat after removal of facilities and parking lots would increase the extent and contiguity of habitat for wildlife; limiting day use activities and roadside parking would reduce impacts on sensitive habitats such as riparian woodland and wet meadows; and reduction in overnight capacities would reduce human pressures on wildlife in general. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of 230 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of 31.66 acres of wildlife habitats primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts wildlife.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 3, the NPS would designate oak protection areas in the Odgers' fuel transfer center and parking lots adjacent to the fuel transfer center. The amount of Valley Oak Woodland habitat restored in Segment 4 would be slightly less under Alternative 3 compared to Alternative 2, but otherwise the total amount of habitat restored would be similar. New parking and building construction would be prohibited within the oak protection area. In the existing parking lot at the fuel transfer center, no parking would be allowed within 10 feet of the base of the oak tree. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore the area. Habitat that would be affected by these restoration actions would occur in Segment 4, as summarized in **table 9-76**.

**TABLE 9-76: ALTERNATIVE 3 HABITAT RESTORATION IN SEGMENT 4**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed Future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Foothill broadleaf woodland	1	Valley oak woodland	1
Sparsely vegetated	2	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	12
Lower montane broadleaf	10		
<b>Total</b>	<b>13</b>	<b>Total</b>	<b>13</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-76, approximately 13 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities due to increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for food and cover.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Impacts related to wildlife in Segment 3 under Alternative 3 would be the same as described for Alternative 2. In Segment 4, user capacity would be mostly affected by the increase in employee housing in El Portal and Rancheria Flat. While all new units would be built outside of the 100-year floodplain, they would fall within the Merced River corridor. This increase in housing capacity in El Portal is a function of the decrease in employee housing capacity in Yosemite Valley (Segment 2). As previously discussed under "Environmental Consequences of Actions Common to Alternatives 2-6," the addition of employee housing and park facilities development would increase the total built

environment in Segment 4. Housing development at El Portal and Rancheria Flat would be expected to result in short-term, minor, adverse impacts on wildlife from construction activities and human presence. In the long term, these actions would result in local, minor, adverse impacts on wildlife from the increased disturbance from human presence.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 13 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

## Segments 5– 8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

In addition to the impacts described above under “Environmental Consequences of Actions Common to Alternatives 2–6,” actions specifically targeted to protect culturally sensitive areas and water quality of the South Fork Merced River would benefit wildlife as well, including the relocation or removal of campsites and stock campground sites that are within the 100-year floodplain or culturally sensitive areas. Under Alternative 3, the removal of facilities within the floodplain to accommodate habitat restoration would also result in beneficial effects on wildlife. Habitat that would be affected by these restoration actions on the South Fork Merced River would occur in Segment 7, as summarized in Table 9-77.

**TABLE 9-77: ALTERNATIVE 3 HABITAT RESTORATION IN SEGMENT 7**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed Future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Barren	40	Meadow	41
Lower montane needleleaf	1		
Lower montane needleleaf	7	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	7
<b>Total</b>	<b>48</b>	<b>Total</b>	<b>48</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-77, a total of approximately 48 acres of riparian and meadow habitats would be restored in Segment 7 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. The removal of select campsites within the floodplain as well as the Wawona Golf Course and tennis courts would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to less human presence and human-related pressures.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Like Alternative 2, Alternative 3 would provide for similar kinds and amounts of use that exist today in Segment 5. Due to the low amount of visitor and administrative use in Segment 5, wildlife habitat would remain relatively intact and undisturbed. The amount, distribution, and integrity of wildlife habitat would remain relatively unchanged from current conditions.

As described previously under Alternative 2, visitor use is not allowed in Segment 6 because of water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected under Alternative 3. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 6 and 8.

Under Alternative 3, Segment 7 would provide for reduced kinds and amounts of use compared to uses today to accommodate for higher levels of river restoration activity. The Wawona Golf Course and Store would be removed to accommodate ecological restoration; however, the sprayfield would remain. The tennis courts would be removed and commercial day rides would be discontinued; the stables in Wawona would be repurposed for another use. Overnight capacities would be reduced at the Wawona Campground, and two campsites at the Wawona stock camp would be relocated to the Wawona stables. Removal of commercial day rides would help to reduce the presence of parasitic bird species, reduce vegetation trampling and soil compaction, and allow for habitat restoration, thereby also benefiting wildlife in the long term. Actions to remove overnight accommodations and other park facilities would result in short-term, adverse impacts on aquatic and terrestrial wildlife during the construction phase, including noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to the South Fork Merced River in the vicinity of these actions. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, as described above, these actions would restore riparian habitat, reduce riverbank erosion, reduce the built environment, and reduce human presence and human-related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, moderate, beneficial impacts on wildlife.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 3 would result in the restoration of 48 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Many of the actions proposed under Alternative 3 would restore aquatic and terrestrial habitats, thereby resulting in beneficial effects on fish and wildlife. This includes actions that are targeted to improve habitat quality for aquatic, riparian- and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with those restoration actions that are common to Alternatives 2–6, up to approximately 302 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 3, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions the park would implement that would directly benefit fish and wildlife under Alternative 3 include the following:

- Remove facilities within 150 feet of the ordinary high water mark of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Redirect recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 31.66 acres of wildlife habitats under Alternative 3. Potential adverse effects from these actions would be associated with the active construction or restoration phase, and would be local, short-term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced. Like Alternative 2, these effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively). Overall, while slightly less restoration is proposed under Alternative 3 than Alternative 2, it would have similar benefits when compared to Alternative 1 (No Action), especially related to human presence, as use levels would be even further reduced.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The past, present, and reasonably foreseeable actions used for this evaluation are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. Like Alternative 2, the actions proposed under Alternative 3 would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River

corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types are most likely to be affected beneficially by the proposed actions.

In general, past actions have degraded and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations caused by development and resource extraction, have resulted in changed movement patterns of fish and wildlife over time as they seek areas with more suitable habitat conditions. Present and reasonably foreseeable future actions also have the potential to further reduce or degrade these habitat types. Because the actions proposed for Alternative 3 would further increase the habitat value of the Merced River corridor, this alternative would contribute toward a long-term, cumulative, beneficial effect on fish and wildlife and may, in some cases, offset or reverse local population declines for some species. Songbirds, reptiles, and amphibians in particular would benefit cumulatively from Alternative 3 because there would be a net increase in quantity of preferred habitat (meadows and riparian) compared to existing amounts.

### ***Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, grazing would be eliminated and administrative pack stock would be required to carry pellet feed in Merced Lake East Meadow, as described for Alternatives 2. Beneficial effects to fish and wildlife would be the same as described for Alternative 2.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 4 would reduce the amount of infrastructure in Segment 1 of the Merced River corridor through the removal of the Merced Lake High Sierra Camp and associated infrastructure. This High Sierra Camp area would be restored to natural conditions and be designated wilderness. Some dispersed camping from the Merced Lake Backpackers Camp would be expanded into the former Merced Lake High Sierra Camp, and wilderness zone capacities would be reduced from 150 to 100. Designated camping areas in Little Yosemite Valley would be reduced and Moraine Dome would be continued along with the existing wilderness trailhead quota system. These actions would have local, short-term, minor, adverse impacts during the construction phase, and local, long-term, minor, beneficial impacts on wildlife if implemented. Adhering to mitigation measures provided MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), would ensure impacts related to construction would be minor and adverse.

Total daily use levels in Segment 1 under Alternative 4 are estimated at 295 overnight users (mostly concentrated at Little Yosemite Valley and Washburn Lake) and approximately 450 day visitors. Compared To Alternative 1 (No Action), in which daily use levels are estimated at 380 overnight users and approximately 450 day visitors, Alternative 4 would significantly reduce the number of overnight users by 85 users, or approximately 22%. The reduction in overnight facilities and overnight visitors



represents a reduction in human presence, human-related pressures on wildlife, and reduced future impacts on wildlife habitat in Segment 1. Collectively, actions to manage visitor use and facilities under Alternative 4 would result in local, long-term, minor, beneficial impacts on wildlife in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 4 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and restoration of the former camp area to natural conditions, including approximately 11 acres of meadow and subalpine restoration in these areas. Construction activities associated with the demolition and removal of the Merced Lake High Sierra Camp would result in short-term, local, adverse impacts on wildlife related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Once completed, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Segment 1 by reducing stresses on wildlife from concentrated human use.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 4 would have local, long-term, minor, beneficial impacts on wildlife.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions proposed under Alternative 4 that would benefit fish and wildlife in the long term include the removal of the Sugar Pine and Ahwahnee bridges, relocating the Camp 6 parking lot away from the ordinary high-water mark, removing pack stock trails and associated Curry Village stables, and restoring meadow and floodplain ecosystems. While the overall amount of habitat with Alternative 4 that would be restored in Segment 2 would be less than that proposed under Alternatives 2 and 3, it would still be substantial. The types of habitat that would be affected by restoration actions are summarized in table 9-78.

As summarized in table 9-78, approximately 194 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit from actions that remove overnight facilities and associated infrastructure (riprap, asphalt pads, trails) within 150 feet of the Merced River, including selective campgrounds and associated facilities in Yosemite Valley and at Housekeeping Camp. Restoration at the Ahwahnee Row and Tecoya concessioner employee housing area would be guided by a 50-foot setback from Indian Creek. The topography and habitat at the former Lower and Upper Rivers Campgrounds would also be restored. These restoration actions would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These actions would have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife in Segment 2.

**TABLE 9-78: ALTERNATIVE 4 HABITAT RESTORATION IN SEGMENT 2**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed Future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Barren	2	Meadow	21
Meadow	17		
Sparsely vegetated	2		
Lower montane broadleaf	15	Lower montane broadleaf	15
Lower montane needleleaf	67	A mosaic of meadow, black oak, and open canopy coniferous forest	67
Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	46
Lower montane needleleaf	45		
Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	45
Lower montane needleleaf	41		
<b>Total</b>	<b>194</b>	<b>Total</b>	<b>194</b>

Abbreviations: WHR = Wildlife Habitat Relationships

<sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.

<sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored.

SOURCE: NPS 1997, 2010, AND 2011.

To enhance the development of riparian vegetation in the vicinity of El Capitan moraine, the park would replant the area upstream aggressively with native vegetation. However, when compared to Alternatives 2 and 3, this action would not directly mitigate for the channel incision upstream that has reduced the frequency of inundation within the riparian zone, meadows, and floodplain. This restorative action would result in local, short-term, adverse impacts on fish and wildlife associated with restoration-related activities, ground disturbance, human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. This restoration action would be expected to have a local, long-term, minor, beneficial impact on fish and other aquatic species that use the Merced River and adjacent riparian habitat in Segment 2.

Under Alternative 4, the park would implement measures to restore and protect meadow by implementing actions that are similar to previous alternatives (Alternatives 2 and 3), but with less intensity. Currently, some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove fill from wetlands and sensitive areas at Ahwahnee Meadow, install boardwalk in wet areas, and add culverts to improve hydrologic connectivity; however, existing roadways and trails would be retained. Stoneman Meadow would be restored by removing a portion of Southside Drive and realignment of the road; the Curry Orchard parking lot would be redesigned to promote water flow

from the cliff walls to Stoneman Meadow; boardwalk would be extended through wet areas to Curry Village. At El Capitan Meadow, all informal trails would be removed and restoration fencing would be used to designate appropriate meadow access points and guide visitors toward boardwalks and viewing platforms to protect meadow habitat, as described for Alternative 3. The Valley Loop Trail would be rerouted out of Slaughterhouse Meadow to an upland area. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats, resulting in beneficial effects on wildlife that use these habitats.

Collectively, these restoration actions would result in local, minor, short-term adverse impacts on wildlife in Segment 2. Potential minor, adverse impacts include noise- related to restoration/removal activities, human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would also enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection; enhance channel free flow; and increase channel complexity. Thus, when combined, these actions under Alternative 4 would result in segmentwide, long-term, moderate, beneficial impacts on wildlife that use riparian and wetland habitats as habitat quality, quantity, and integrity are improved and habitat disturbance is decreased in Segment 2.

#### **Biological Resource Actions.**

***Yosemite Valley Campgrounds:*** Like Alternative 3, specific restoration actions under Alternative 4 to enhance the river's biological values in Segment 2 include removing all campsites within 150 feet of the bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6, Alternative 4 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 4 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation.

***Ahwahnee Meadow:*** Specific actions under Alternative 4 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. However, unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 4. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term,

minor to moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

***Stoneman Meadow:*** Like Alternatives 2 and 3, specific actions in Alternative 4 to enhance the biological values of the Merced River include restoring Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boystown area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275'). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on meadow wildlife.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 4 include restoring the topography of 16.5 acres of the floodplain. Alternative 4 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 4 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

**Hydrologic/Geologic Resource Actions.** Under Alternative 4, specific restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, removing the Ahwahnee and Sugar Pine Bridges to enhance the free-flowing condition of the Merced River, and mitigate for the scouring effects of Stoneman Bridge by placement of large wood. Additionally, riparian habitat would be restored where needed, and brush layering and a constructed logjam would be placed in the vicinity of the Stoneman Bridge. Drainage in this area would be improved by the addition of culverts. At the Ahwahnee Bridge, trails would be rerouted or connected to resilient areas (e.g., the north bank of the river). Restoration of riparian and floodplain habitats and enhancing the free-flowing condition of the river would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that use riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and

black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 4 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, the NPS would reduce the maximum daily visitation allowed in Yosemite Valley from current levels to allow for increased resource restoration and reduce crowding and congestion in Segment 2. However, Alternative 4 differs from Alternatives 2 and 3 because both commercial and private boating would be allowed in Segment 2 of the river corridor. Therefore, potential beneficial effects on fish and wildlife related to reductions in human disturbance would not be as substantial as with Alternatives 2 and 3.

In general, visitor use in Segment 2 under Alternative 4 would be reduced as a result of reducing or repurposing park facilities. The following facilities would be reduced or repurposed under Alternative 4: Curry Village stables (stock day rides would no longer be available), Yosemite Lodge Gift Shop and Nature Shop, and Housekeeping Camp shower houses and restrooms. The Housekeeping Camp Grocery Store would be removed. In addition, some Housekeeping Camp lodging units would be converted into a day use area. These actions would generally have local, minor, beneficial to negligible effects on wildlife related to a reduction in human disturbance.

In addition, Alternative 4 would create opportunities for picnicking adjacent to some parking areas such as Superintendent's House (Residence 1), Yosemite Village, Church Bowl, and Happy Isles. Private and commercial boating would be allowed in Segment 2; however, the location of use and amount of use would be limited to certain segments (and reaches within those segments) and regulated by a permit system. Compared to Alternative 1 (No Action), these actions would generally have local, minor to negligible, beneficial effects on fish and wildlife.

Alternative 4 would increase the capacity of overnight camping accommodations in Segment 2, mostly as a result of increases in individual and group camp sites. Additionally, permanent employee housing would be constructed at Yosemite Village and Curry Village, and new campgrounds would be constructed at the former Lower and Upper Rivers Campgrounds 150 feet away from the river. This increase in overnight camping accommodations and permanent employee housing would result in local, minor to moderate, adverse impacts on wildlife habitat and may increase human-wildlife conflicts in Segment 2, especially with black bears. The increase in capacity of overnight camping accommodations would require an increase in Wildlife Management staffing dedicated to the Bear Program and potentially impact Wildlife Management's funding for use on other ecologically-relevant issues and protection of special-status species. The increase in human-wildlife conflicts would be most

pronounced at the Upper Pines Campground, former Lower River and Upper River campgrounds, Boys Town, Curry Village stables, west of Yosemite Lodge, Camp 4, and west of Backpackers Campground (although 25 current campsites would be removed from the 100-year floodplain). Lodging capacity would decrease under Alternative 4; however, day parking would be reduced by removing parking spaces that are currently located within the 100-year floodplain and formal and informal roadside parking areas. To compensate for loss of parking, new parking spaces would be added west of the current Yosemite Lodge parking. The new parking areas would be constructed in previously disturbed areas and would not result in a loss of wildlife habitat, resulting in negligible effects.

Actions that remove or reduce park facilities under Alternative 4 would result in local, short-term, adverse impacts on fish through potential discharges of sediments and other pollutants during construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Removal of facilities located adjacent or within the 100-year floodplain would allow for natural reestablishment of riparian vegetation along the Merced River corridor and would have local, long-term, moderate, beneficial impacts on aquatic and terrestrial wildlife inhabiting these areas. In the long-term, wildlife would benefit from reduced human presence and human-related pressures (such as noise, human food, and vegetation trampling). Continued use of select facilities within the floodplain would result in continued minor, adverse impacts on riparian habitat and wildlife in limited areas of Segment 2.

Although construction of new campsites would occur outside of the dynamic 10-year floodplain, new development under Alternative 4 would result in local, short-term, minor, adverse impacts on aquatic wildlife and local, long-term, minor, adverse impacts on wildlife in Segment 2. Adverse impacts include noise associated with construction activities, human presence, and disturbance or minor habitat losses in each project area. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Long-term, adverse impacts would include effects associated with increased human presence. Likewise, actions to add day parking and picnic areas would have similar temporary and long-term impacts.

**Curry Village & Campgrounds.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village and the rerouting of South Side Drive at Boys Town. Construction activities at Curry Village would result in direct, temporary and permanent losses of wildlife habitats as well as redevelopment of existing developed areas (table 9-79). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-79 below, only a small percentage of the affected wildlife habitats would be affected by the facility actions in Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.



**TABLE 9-79: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 4**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

**Camp 6 and Yosemite Village.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area would be formalized with 750 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. The intersection at Northside Drive and Village Drive (Camp 6 intersection) would be re-aligned to meet standards for a proper four-way intersection and improve performance. A three-way intersection at Sentinel Drive and the entrance to the parking area would be added to improve traffic flow and alleviate congestion. An entry road to Camp 6 parking lot from Sentinel Drive would be added to improve traffic flow and alleviate congestion at nearby intersections. On-grade pedestrian crossings with proper sight lines would be provided to alleviate pedestrian/vehicle conflicts.

As noted in **table 9-80**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses would primarily occur in ponderosa pine forest and, to a much lesser extent, montane riparian and wet meadow habitats. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-80**, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction activities under Alternative 4 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

**TABLE 9-80: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 4**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Riparian	0.81	0.3%
Ponderosa Pine	12.22	0.7%
Wet Meadow	0.28	<0.1%
Redevelopment <sup>b</sup>	14.18	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

**Yosemite Lodge and Camp 4.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (**table 9-81**). Impacts to wildlife habitats would occur entirely in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-81, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-81: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 4**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	0.08	<0.1%
Ponderosa Pine	14.80	0.8%
Redevelopment <sup>b</sup>	3.69	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 4 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, as shown in table 9-82, actions to manage visitor use and facilities would result in the loss of 34.57 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

**TABLE 9-82: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 4**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	0.08	<0.1%
Montane Riparian	0.81	0.3%
Ponderosa Pine	33.37	1.8%
Wet Meadow	0.31	<0.1%
Redevelopment <sup>b</sup>	19.84	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Under Alternative 4, total visitor use levels would reduce by 19% from the total visitors per day who visited Yosemite Valley in 2011. Total day use would reduce by 29%. Although there is an overall reduction in total visitor use levels in Segment 2 under Alternative 4, there is a net increase in the total overnight accommodations in Yosemite Valley by 7%. Thus, human-related impacts on wildlife in Segment 2, especially during the peak season (summer) would continue to be long-term, local, minor and adverse. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, wildlife would also benefit from a combination of other actions to manage visitor use and park facilities in Segment 2. The overall reduction in maximum total daily visitation to the Valley from current levels, combined with restoration activities, would promote the recovery of riparian vegetation and reduce human-related pressures on wildlife in sensitive areas such as riparian habitats adjacent to the river corridor in Segment 2. The quality of wildlife habitat in Segment 2 would be improved in general under Alternative 4.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 4 would result in the restoration of 194 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities

would result in the loss of 34.57 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 4, the NPS would designate oak protection areas in the Odgers' fuel transfer center and parking lots adjacent to the fuel transfer center to improve root health, water uptake, and soil aeration for oak trees. Parking within 10 feet of the base of oak trees would be prohibited. New parking and building construction would be prohibited within the oak protection area. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore the area. Habitat restoration actions that would occur in Segment 4 are summarized in **table 9-83**, and are similar to those described for Alternatives 2 and 3.

**TABLE 9-83: ALTERNATIVE 4 HABITAT RESTORATION IN SEGMENT 4**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Foothill broadleaf woodland	1	Valley oak woodland	1
Sparsely vegetated	2	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	11
Lower montane broadleaf	9		
<b>Total</b>	<b>12</b>	<b>Total</b>	<b>12</b>
Abbreviation: WHR = wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-83, a total of approximately 12 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities due to increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for habitat and food.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Like other alternatives, Alternative 4 would provide for similar kinds and amounts of use that exist today in Segment 3. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under Alternative 4.

In Segment 4, visitor day parking would be expanded at the Abbieville site; this area would primarily be used for visitor access to Yosemite Valley. The expanded parking area would be constructed within an existing disturbed area (Abbieville/Trailer Village), so impacts on wildlife habitat would be avoided. However, there would local, long-term, minor, adverse impacts on wildlife related to increased human disturbance.

Under Alternative 4, employee housing would be developed at El Portal Village Center and Rancheria Flat and new employee parking spaces would be added at these locations. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. The addition of employee housing and park facilities development would increase the total built environment in Segment 4. Housing development at El Portal and Rancheria Flat would be expected to result in short-term impacts on wildlife from construction activities and human presence, while in the long term, these actions would result in local, minor, adverse impacts on wildlife caused by increased disturbance from human presence.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 under Alternative 4 would result in the restoration of 12 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

#### Segments 5– 8: South Fork Merced River

##### *Impacts of Actions to Protect and Enhance River Values*

Compared to Alternatives 2 and 3, Alternative 4 would include less habitat restoration as the Wawona Golf Course and tennis courts would remain. Actions specifically targeted to protect culturally sensitive areas would benefit wildlife as well, including the relocation or removal of select campsites and stock campground sites that are within the 100-year floodplain or culturally sensitive areas. Effects on habitat as a result of restoration actions that would occur in Segment 7 are summarized in **table 9-84**.

**TABLE 9-84: ALTERNATIVE 4 HABITAT RESTORATION IN SEGMENT 7**

Current habitat type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Lower montane needleleaf	7	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	7
<b>Total</b>	<b>7</b>	<b>Total</b>	<b>7</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-84, a total of approximately seven acres of riparian habitat would be restored in Segment 7 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The removal of select campsites within the floodplain would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to less human presence and human-related pressures.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Alternative 4 would provide for similar kinds and amounts of use that exist today in Segment 5. Visitor use is not allowed in Segment 6 due to water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 5, 6, and 8.

Under Alternative 4, Segment 7 would provide for similar kinds and amounts of use compared to those that exist today. Unlike Alternatives 2 and 3, the Wawona Golf Course and Store would remain under Alternative 4. In addition, the Wawona Hotel tennis courts would remain. Therefore, impacts from these improvements would remain unchanged from the Alternative 1 (No Action). However, commercial day rides would be discontinued and the Wawona stables would be repurposed as campgrounds. Private boats would be allowed in Segment 7; however, limitations on location and amount of use would be applied. Overnight capacities would be reduced at the Wawona Campground and two campsites at the Wawona Stock Campground would be relocated to the Wawona stables. Additional day parking would be added for the Mariposa Grove outside of the river corridor. These actions would result in negligible effects on wildlife.

Removal of commercial day rides under Alternative 4 would help to reduce the presence of parasitic bird species, reduce vegetation trampling and soil compaction, and allow for habitat restoration. Actions to reduce overnight capacities would result in short-term, adverse impacts on aquatic and terrestrial wildlife, including noise associated with demolition, removal, and restoration activities; ground disturbance, human presence, habitat modification, and potential increase in suspended sediments to immediate areas of the Merced River in Segment 7. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. Continued operation of the Wawona Golf Course and Store, and the Wawona Hotel tennis courts would continue to contribute to the total built environment in Segment 7 of the river corridor. However, the Alternative 4 combined actions would restore riparian habitat, reduce riverbank erosion, reduce the overall built environment, and reduce human presence and human related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, minor, beneficial impacts on wildlife.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.



**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 4 would result in the restoration of seven acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Several actions proposed under Alternative 4 would benefit fish and wildlife, including actions that are targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 223 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 4, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions the park would implement that would directly benefit fish and wildlife under Alternative 4 include the following:

- Remove structures and restore riverbanks, meadows, and riparian habitat in targeted areas within the river corridor; riparian vegetation would be aggressively restored in some areas such as upstream of El Capitan moraine.
- Redirect recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day use parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 34.57 acres of wildlife habitats under Alternative 4. Potential adverse effects from these actions would primarily be associated with the active construction or restoration phase, and would be local, short term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced. While the expansion of overnight camping in Segment 2 would result in local, adverse impacts on wildlife due to loss of habitat, increased human-wildlife conflicts, and increased human presence in surrounding affected campgrounds, these impacts would be offset by an overall decrease in visitor use as well as an increase in habitat quality and quantity through restoration actions.

### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The past, present, and reasonably foreseeable actions used for the Alternative 4 evaluation are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. The actions under Alternative 4 would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types would be most likely to be affected cumulatively by the proposed actions. While some localized increases in habitat disturbance would occur, overall visitor use would decrease and habitats would be restored.

Wildlife communities have been manipulated by human development and population growth throughout the region for decades, and these actions have in many cases negatively influenced wildlife and wildlife habitat. The cumulative effects of past, present, and future reasonably foreseeable actions would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and enhancement projects and ecosystem management, generally carried out by federal, state, and local public agencies as well as privately owned and managed conservation lands, open space, and mitigation banks. Adverse cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Each of the aforementioned projects (listed under Alternative 1) has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short term) and by direct displacement of resources (long term). In total, regional development and growth would contribute towards a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. When these effects are combined cumulatively with the effects of restoration projects and other actions under Alternative 4, conditions for fish and wildlife populations in the study area would improve over time. While Alternative 4 would cumulatively contribute beneficial impacts, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be long term, minor, and beneficial.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to fish and wildlife would be the same as described for Alternative 3.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 5 would accommodate the same kinds and amounts of use that exist today in Segment 1. Visitor use would continue to focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Private boating by permit would be allowed under Alternative 5.

Overnight capacities at Merced Lake High Sierra Camp would be reduced; additionally, the flush toilets would be converted to composting toilets. All other zone capacities would remain similar to current levels along with the existing wilderness trailhead quota system. These actions would have local, long-term, minor, beneficial impacts on fish and wildlife in Segment 1.

Total daily use levels in Segment 1 under Alternative 5 are estimated at 362 overnight users and approximately 450 day visitors. Compared with Alternative 1 (No Action), with an estimated 380 overnight users and approximately 450 day visitors daily, Alternative 5 would reduce the number of overnight users by 18 users, or approximately 5%. The slight reduction in overnight facilities and overnight visitors represents a reduction in human presence, human-related pressures on wildlife, and reduced future impacts on wildlife habitat in Segment 1. Collectively, actions to manage visitor use and facilities under Alternative 5 would result in local, long-term, minor beneficial impacts on wildlife in Segment 1. The removal and conversion of existing improvements would result in local, short-term, adverse impacts on wildlife, including noise related to removal of infrastructures and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 5 involve retention of the Merced Lake High Sierra Camp, reducing the capacity to 42 beds, and replacing the flush toilets with composting toilets. These actions would result in a local, long-term, negligible, beneficial impact on wildlife in Segment 1 by reducing stresses on wildlife from visitor use and presence of infrastructure.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 5 would have local, long-term, negligible, beneficial impacts on wildlife.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Alternative 5 proposes substantial restoration actions that would directly benefit fish and wildlife in Segment 2. The free-flowing condition of the Merced River would be enhanced by the removal of the Sugar Pine Bridge and the associated multi-use paved trail connecting Sugar Pine Bridge and Ahwahnee Bridge. Hydrological impacts of the Stoneman and Ahwahnee bridges would be mitigated with strategic placement of large wood on riverbanks, brush layering, and constructed logjams to address scouring. Water quality would be improved by relocating the Camp 6 parking lot away from the ordinary high-water mark and restoring riparian vegetation. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-85**.

As summarized in **table 9-85**, a total of approximately 182 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands,

**TABLE 9-85: ALTERNATIVE 5 HABITAT RESTORATION IN SEGMENT 2**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed Future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Meadow	16	Meadow	18
Sparsely vegetated	2		
Lower montane broadleaf	15	Lower montane broadleaf	15
Lower montane needleleaf	65	A mosaic of meadow, black oak, and open canopy coniferous forest	65
Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	44
Lower montane needleleaf	41		
Barren	2		
Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	40
Lower montane needleleaf	36		
<b>Total</b>	<b>182</b>	<b>Total</b>	<b>182</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

riparian habitat, and riverine ecosystems would benefit from actions that remove select overnight and employee housing facilities within 100 feet of the ordinary high-water mark, including select camp sites at Backpackers Campground, Housekeeping Camp, Lower Pines Campground, and North Pines Campground. Approximately 20 acres of land within 150 feet of the ordinary high-water mark of the Merced River would be restored to riparian and floodplain habitat at the former Lower River Campground. Restoration at the Ahwahnee Row and Tecoya concessioner employee housing area would be guided by a 50-foot setback from Indian Creek. To enhance the development of riparian vegetation in the vicinity of El Capitan moraine, the park would replant the area aggressively with native vegetation, as described for Alternative 4. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

These actions would also result in local, short-term, adverse impacts on fish and wildlife during construction from ground disturbance, effects associated with human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. When completed, these actions would have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife.

In addition to actions to restore riparian and aquatic habitat associated with the Merced River, Alternative 5 includes measures to restore and protect meadows by implementing actions that are similar to Alternatives 2–4, but only in essential areas that require restoration. Currently, some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of Valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove fill from wetlands and sensitive areas at the Ahwahnee Meadow, install boardwalk in wet areas, and add culverts to improve hydrologic connectivity (roadways and trails would be retained under Alternative 5). Stoneman Meadow would be restored by removing roadside parking and unnatural fill material, extending fencing to protect wetlands, and the Curry Orchard parking lot would be redesigned to promote water flow from the cliff walls to Stoneman Meadow. Fencing would be installed along the northern perimeter of El Capitan Meadow, and boardwalks and viewing platforms would be installed to reduce habitat fragmentation. Boardwalks would be constructed at the Valley Loop Trail to reduce impacts on wet meadow habitat in Slaughterhouse Meadow. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats. Collectively, these restoration actions would result in local, short-term, minor, adverse impacts on wildlife. Potential minor, adverse impacts include noise related to restoration/removal activities, effects associated with human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would also enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection; enhance channel free flow; and increase channel complexity. Thus, when combined, the Alternative 5 actions would result in segmentwide, long-term, minor to moderate, beneficial impacts on wildlife that use riparian and wetland habitats in Segment 2 as habitat quantity and quality is improved in several areas. Additionally, the removal of select campgrounds within 100 feet of the ordinary high-water mark of the Merced River would reduce human presence and human-related impacts on riparian and aquatic wildlife species in localized areas in Segment 2.

### **Biological Resource Actions.**

**Yosemite Valley Campgrounds:** Specific restoration actions under Alternative 5 to enhance the river's biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, minor to moderate, and beneficial impacts to fish and wildlife.

**El Capitan Meadow:** In addition to actions common to Alternatives 2-6 and similar to Alternative 4, Alternative 5 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 5 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Conifers that block views of El Capitan from the roadside would be selectively removed. Restoration of El Capitan Meadow and rerouting or removal

of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation.

**Ahwahnee Meadow:** Similar to Alternative 4, specific actions under Alternative 5 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 5. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

**Stoneman Meadow:** Specific actions in Alternative 5 to enhance the biological values of the Merced River include restoring Stoneman Meadow by redesigning the Orchard Parking Lot. Through engineering solutions, Alternative 5 would promote water flow by increasing drainage from the cliff walls of the parking lot to Stoneman Meadows, thus improving meadow health. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, and beneficial impacts on meadow habitat and associated meadow wildlife.

**Former Upper and Lower Rivers Campgrounds:** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 5 include restoring 35.6 acres of riparian and floodplain habitat at Lower Rivers Campground. Alternative 5 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 5 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

**Hydrologic/Geologic Resource Actions.** Under Alternative 5, specific restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, removing the Sugar Pine Bridge and berm to enhance the free-



flowing condition of the Merced River, and mitigate for the scouring effects of Stoneman Bridge by placement of large wood. Additionally, riparian habitat would be restored where needed, and brush layering and a constructed logjam would be placed in the vicinity of the Stoneman Bridge. Drainage in this area would be improved by the addition of culverts. At the Ahwahnee Bridge, trails would be rerouted or connected to resilient areas (e.g., the north bank of the river). Restoration of riparian and floodplain habitats, and enhancing the free-flowing condition of the river would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that use riparian and riverine habitats would benefit the most from these actions. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 5 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 5 would maintain similar kinds and amounts of visitor use and facilities in Yosemite Valley to those that exist today, with a few services and facilities reduced or eliminated (e.g., discontinue commercial day horseback rides from the Curry Village Stables, remove the Boystown Housing area, Happy Isles Snack Stand, and the Ice Rink). Overnight accommodations would increase and day parking and transit options would be expanded. Overall, Alternative 5 would accommodate the peak use levels during the summer season similar to current levels.

Overnight capacities would increase in the Valley under Alternative 5. This increase would affect wildlife in the vicinity of Upper Pines Campground, former Upper River Campground, west of Backpackers Campground (although 15 current campsites would be removed from the 100-year floodplain), and in the vicinity of Camp 4 (Sunnyside Campground). Additionally, permanent employee housing would be constructed at Yosemite Village and Curry Village. These actions would result in both short- and long-term, local, minor, adverse impacts on wildlife related to increased human disturbance and human-wildlife conflicts, minor habitat loss (most actions would occur in existing disturbed areas), and increased radiating impacts. The increase in capacity of overnight camping accommodations would require an increase in Wildlife Management staffing dedicated to the Bear Program and potentially impact Wildlife Management's funding for use on other ecologically-relevant issues and protection of special-status species.

Day parking capacity would be expanded and formalized to provide additional parking spaces; most day parking would be provided at existing designated parking areas, but a new overflow parking area (the West Valley Overflow Parking Area) would be constructed in West Yosemite Valley, west of Cathedral Picnic Area and south of Southside Drive. While the construction of this new facility would not affect any sensitive habitats for wildlife, it would result in a substantial increase in visitor use and disturbance in an area that currently does not experience high levels of visitor use (when compared to East Yosemite Valley). Therefore, construction of this facility would result in local, long-term,

moderate, adverse impacts on wildlife. In addition, the NPS proposes the construction of new roundabout at the Bank 3-way intersection and a new pedestrian underpass at the Yosemite Falls intersection under Alternative 5. These actions would result in minor habitat loss near existing roadways and other improved areas, resulting in local, long-term, minor impacts on wildlife. In addition, construction activities would result in increased human presence, noise, and potential for sediment discharges immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these impacts to minor and adverse.

**Curry Village & Campgrounds.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village, including the construction of 98 hard-sided units, and the rerouting of South Side Drive at Boys Town. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct, temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (see **table 9-86**). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-86** below, only a small percentage of these wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts and disturbance. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-86: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 5**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of

construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

**Camp 6 and Yosemite Village.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area would be formalized with 850 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. Northside Drive would be re-routed to the south of the Yosemite Village day-use parking area. A pedestrian underpass and a roundabout at the Village Drive/Northside Drive (Camp 6) intersection would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection at Sentinel Drive and the entrance to the parking area would be added to improve traffic flow and alleviate congestion at nearby intersections.

As noted in **table 9-87**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses would primarily occur in ponderosa pine forest and, to a much lesser extent, montane riparian and wet meadow habitats. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-87, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-87: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 5**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Riparian	0.81	0.3%
Ponderosa Pine	12.22	0.7%
Wet Meadow	0.28	<0.1%
Redevelopment <sup>b</sup>	14.18	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related activities under Alternative 5 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

**Yosemite Lodge and Camp 4.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (table 9-88). Impacts to wildlife habitats would occur in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2, as well as in montane hardwood habitat. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-88, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-88: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 5**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	1.73	<0.1%
Ponderosa Pine	15.47	0.9%
Redevelopment <sup>b</sup>	3.69	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 5 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, as shown in table 9-89, actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

Total daily visitor use in Yosemite Valley would decrease slightly under Alternative 5 (by 5%) compared to current levels. Total day visitors would decrease by 14%; however, total overnight visitors would increase by 16% in the Valley under Alternative 5. Continued levels of total visitors in Segment 2 of the river corridor would maintain human-related impacts on wildlife, especially during the peak season (summer). An increase in overnight visitor use would increase human-related impacts on wildlife in

**TABLE 9-89: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 5**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	1.73	<0.1%
Montane Riparian	0.81	0.3%
Ponderosa Pine	34.04	1.9%
Wet Meadow	0.31	<0.1%
Redevelopment <sup>b</sup>	19.84	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Segment 2, and would continue to be long-term, local, minor and adverse. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Thus, actions to maintain total daily use and to increase the number of overnight visitors in Segment 2 would have segmentwide, long-term, minor, adverse effects on wildlife through human disturbance to habitats and increased human-wildlife conflicts.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 5 would result in the restoration of 182 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Restoration and enhancement actions in Segments 3 and 4 under Alternative 5 would be similar to those described for Alternative 4. The park would designate oak protection areas in the Odgers' fuel transfer center and parking lots adjacent to the fuel transfer center to improve root health, water uptake, and soil aeration for oak trees. New parking and building construction would be prohibited within the oak protection area. Parking within 10 feet of the base of oak trees would be prohibited. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore valley oak woodland habitat. Habitat restoration actions that would occur in Segment 4 are summarized in **table 9-90**.

**TABLE 9-90: ALTERNATIVE 5 HABITAT RESTORATION IN SEGMENT 4**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed Future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Foothill broadleaf woodland	1	Valley oak woodland	1
Lower montane broadleaf	11	Riparian & floodplain	11
<b>Total</b>	<b>12</b>	<b>Total</b>	<b>12</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-90, approximately 12 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities from increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for habitat and food.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Alternative 5 would provide for similar kinds and amounts of use that exist today in Segment 3. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under Alternative 5. Impacts would be similar to those described for Alternative 1 (No Action).

In Segment 4, Alternative 5 would introduce additional visitor use with the development of a remote parking area and increase in employee housing throughout El Portal. Impacts associated with the construction and operation of these improvements would be the same as described for Alternative 4. Thus, actions to manage visitor use and park facilities in Segment 4 under Alternative 5 would collectively result in local, long-term, minor, adverse impacts on wildlife.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 under Alternative 5 would result in the restoration of 12 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

#### **Segments 5–8: South Fork Merced River**

##### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 5, restoration actions would be limited to actions specifically targeted to protect culturally sensitive areas and relocating two stock use campground sites that are within the 100-year floodplain or culturally sensitive areas to the Wawona Maintenance area. Restoration actions that would occur in Segment 7 are summarized in **table 9-91**.

**TABLE 9-91: ALTERNATIVE 5 HABITAT RESTORATION IN SEGMENT 7**

Current habitat type	Acres	Proposed Future Habitat Type	Acres restored or enhanced
Lower montane needleleaf	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
<b>Total</b>	<b>3</b>	<b>Total</b>	<b>3</b>
<p>Abbreviation: WHR = Wildlife Habitat Relationships</p> <p><sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.</p> <p><sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored.</p> <p>SOURCE: NPS 1997, 2010, and 2011.</p>			

Approximately three acres of riparian habitat would be restored in Segment 7 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The relocation of campsites within the floodplain would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to decreased human presence.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Alternative 5 would result in the same effects on wildlife as described for Alternative 4 in Segments 5, 6, and 8. While recreation-related activities would be somewhat higher under Alternative 5 than under Alternative 4, these segments do not experience as much concentrated use, and effects on wildlife would be negligible.

Under Alternative 5, Segment 7 would provide for similar kinds and amounts of use compared with current uses. The Wawona Golf Course and Store and the Wawona Hotel tennis courts would remain under Alternative 5. Commercial day rides would continue and private boats would be allowed in Segment 7; however, limitations on location and amount of use would be applied. Overnight capacities would be slightly reduced at the Wawona Campground, and two campsites at the Wawona stock camp would be relocated to the Wawona stables. Additional day parking would be added for the Mariposa Grove outside of the river corridor. Daily use levels associated with Segment 7 under Alternative 5 are estimated at 14,384 people per day for all users (similar to Alternatives 3 and 4), with visitor use representing the majority at 13,443 people per day. The reduction in day use and total daily visitor numbers would reduce human-related pressures on wildlife in general.

The removal of overnight capacities would result in short-term, adverse impacts on aquatic and terrestrial wildlife, including noise associated with demolition, removal, and restoration activities; ground disturbance; effects associated with human presence; habitat modification; and potential increase in suspended sediments to the Merced River in Segment 7. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long term, removal of some campsites at the Wawona Campground and relocation of the stock use campsites would allow for habitat restoration, which would benefit wildlife.



Continued operation of the park facilities in Segment 7 would contribute to the total built environment in Segment 7. Combined actions under Alternative 5 would restore some riparian habitat and reduce riverbank erosion, slightly reduce the overall built environment, and slightly reduce human presence and human-related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, minor, beneficial impacts on wildlife.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 5 would result in the restoration of three acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Many of the Alternative 5 actions would improve habitat conditions for fish and wildlife, including actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, Alternative 5 includes measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 197 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 5, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions under Alternative 5 that would benefit fish and wildlife include the following:

- Remove facilities in targeted areas near the Merced River and restore riverbanks, meadows, and riparian habitat; riparian vegetation would be aggressively restored in some areas such as the vicinity of El Capitan moraine.
- Restrict recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats. Alternative 5 would not significantly change the total daily visitation rates to Yosemite Valley from current rates; however, it would increase total overnight visitation rates by 16%. Thus, human-related pressures to wildlife and wildlife habitat in Segment 2 may increase compared to current conditions. The management of parking areas (reducing informal parking) and overnight use would reduce ongoing impacts on habitat related to human disturbance. In addition, the construction of new parking and campground areas would result in both short-term and long-term, local, adverse effects on wildlife. The construction of a new parking area in West Yosemite Valley would have the greatest impact of proposed facilities because it would introduce additional human activity in a location that does not currently experience heightened use. Adverse effects from Alternative 5 associated with restoration activities would be limited to the construction or restoration phase and would be local, short term, and minor or negligible. However, the collective long-term effect of restorative measures and construction of new facilities outside of the floodplain and sensitive habitats would be minor and beneficial to fish and wildlife as habitats are restored and the quality, quantity, and integrity of habitat in the Merced River corridor is improved. Like Alternatives 2-4, these effects would be most prominent in areas of high human use, such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The past, present, and reasonably foreseeable actions used for evaluating Alternative 5 are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. The Alternative 5 actions would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types would be most likely to be affected cumulatively beneficially by the proposed actions.

Wildlife communities have been manipulated by human development and population growth throughout the region for decades, and these actions have negatively influenced wildlife and wildlife habitat. The cumulative effects of past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration, enhancement projects, and ecosystem management, generally carried out by federal, state, and local public agencies as well as privately owned and managed conservation lands, open space, and mitigation banks. Adverse cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Each of the aforementioned projects (listed under Alternative 1) has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short term) and by direct displacement of resources (long term). In total, regional development and growth would contribute toward a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. When these effects are combined cumulatively with the effects of restoration projects and other actions under Alternative 5, conditions for fish and wildlife populations in the study area would remain stable or improve from higher habitat quality along the Merced River. Although general effects associated with Alternative 5 would be

beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative, would be long term and negligible.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to fish and wildlife would be the same as described for Alternative 3.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 6 would accommodate the same kinds and amounts of use that exist today in Segment 1. Visitor use would continue to focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Primary visitor use in Segment 1 would include hiking, private boating, and overnight backpacking. Private boating by permit would be allowed under Alternative 6. Overnight capacities at Merced Lake High Sierra Camp would be maintained at current levels; additionally, the flush toilets would be converted to composting toilets. All other zone capacities would remain similar to current levels along with the existing wilderness trailhead quota system. Collectively, actions to maintain similar kinds and levels of use as current levels would result in impacts similar to that described for Alternative 1 (No Action): continued local, long-term, minor, adverse impacts on wildlife in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 6 involve retention of the Merced Lake High Sierra Camp and replacing the flush toilets with composting toilets. Actions to maintain similar kinds and levels of use as current levels would result in continued local, long-term, minor, adverse impacts on wildlife within Segment 1 through ongoing stresses related to concentrated human use.

**Segment 1 Impact Summary:** Actions to manage visitor use and facilities within Segment 1 under Alternative 6 would have local, long-term, minor, adverse impacts on wildlife.

#### **Segment 2: Yosemite Valley**

##### ***Impacts of Actions to Protect and Enhance River Values***

Alternative 6 would result in the lowest amount of habitat being restored when compared with Alternatives 2, 3, 4, and 5, although the amount proposed is still substantial. The free-flowing condition of the Merced River would be enhanced with strategic placement of large wood on riverbanks to address scouring and the addition of brush layering and constructed logjams. Alternative 6 includes measures to fill in the cutoff channel before the Sugar Pine Bridge and place large wood below Sugar Pine Bridge to reduce scour. Additionally, culverts would be installed along Northside

Drive to improve drainage. Water quality would be enhanced by moving the unimproved parking lot at Camp 6 away from the river and rerouting the stock use trail from Curry Village stables to Happy Isles north of the existing trail. These actions would all directly benefit fish and wildlife associated with the Merced River over the long term. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-92**.

**TABLE 9-92: ALTERNATIVE 6 HABITAT RESTORATION IN SEGMENT 2**

Current WHR Habitat Type <sup>a</sup>	Acres	Proposed Future WHR Habitat Type <sup>a</sup>	Acres (WHR Habitat Type Restored/Enhanced) <sup>b</sup>
Meadow	16	Meadow	18
Sparsely vegetated	2		
Lower montane broadleaf	15	Lower montane broadleaf	15
Lower montane needleleaf	58	A mosaic of meadow, black oak, and open canopy coniferous forest	58
Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	29
Lower montane needleleaf	28		
Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	36
Lower montane needleleaf	32		
<b>Total</b>	<b>156</b>	<b>Total</b>	<b>156</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-92, approximately 156 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit the most from actions that remove select overnight camping and lodging facilities within 100 feet of the ordinary high-water mark, including campsites at Backpackers Campground, Housekeeping Camp, Lower Pines Campground, and North Pines Campground; redesign Yosemite Lodge out of the 100-year floodplain; and restore 11.6 acres of riparian habitat. Approximately 16.5 acres of land within 150 feet of the ordinary high-water mark of the Merced River would also be restored to riparian and wetland habitat at the former Upper and Lower River campgrounds. Restoration at the Ahwahnee Row and Tecoya concessioner employee housing area would be guided by a 50-foot setback from Indian Creek. Restoration actions within these select areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These

actions would result in segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife in Segment 2.

To enhance the development of riparian vegetation in the vicinity of El Capitan moraine, the park would increase large wood loading upstream of the El Capitan moraine to Sentinel Beach Picnic Area and place large wood and constructed logjams in the channel, as described for Alternative 2. This restoration action would be expected to have a local, long-term, minor, beneficial impact on fish and other aquatic species that use the Merced River and adjacent riparian habitat in Segment 2.

Under Alternative 6, the park would implement measures to restore and protect meadows by implementing actions that are similar to Alternatives 2–5 but only in select areas that require restoration. Currently, some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of Valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove fill from wetlands and sensitive areas at Ahwahnee Meadow, install boardwalk in wet areas, and add culverts to improve hydrologic connectivity (roadways and trails would be retained under Alternative 6). Stoneman Meadow health would be improved by redesigning and engineering the Curry Orchard parking lot to promote water flow from the cliff walls to Stoneman Meadow. Fencing would be installed along the northern perimeter of El Capitan Meadow, and boardwalks and viewing platforms would be installed to reduce habitat fragmentation. Boardwalks would be constructed at the Valley Loop Trail also to reduce impacts on wet meadow habitat in Slaughterhouse Meadow. Select conifer trees in El Capitan Meadow would be removed. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows over time, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats.

Collectively, these restoration actions would result in local, minor, short-term adverse impacts to wildlife in Segment 2. Potential minor, adverse impacts include noise related to restoration/removal activities, effects associated with human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection and enhance channel free flow and increase channel complexity. Thus, when combined, the actions would result in segmentwide, long-term, minor to moderate, beneficial impact to wildlife that use riparian and wetland habitats in Segment 2. Additionally, the removal of select campgrounds within the 100 feet of the ordinary high-water mark of the river under Alternative 6 would slightly reduce human presence and human-related impacts on riparian and aquatic wildlife species.

### **Biological Resource Actions.**

***Yosemite Valley Campgrounds:*** Like Alternative 5, specific restoration actions under Alternative 6 to enhance the river's biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and

designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, minor to moderate, and beneficial impacts to fish and wildlife.

***El Capitan Meadow:*** Alternative 6 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. The NPS would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Additionally, Alternative 6 would selectively remove conifers that block the views of El Capitan from the roadside. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation. Selective removal of conifers would result in local, long-term, minor, and adverse impacts on wildlife because there is abundant similar habitat nearby.

***Ahwahnee Meadow:*** Similar to Alternatives 4 and 5, specific actions under Alternative 6 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 6. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

***Stoneman Meadow:*** Like Alternative 5, specific actions in Alternative 6 to enhance the biological values of the Merced River include restoring Stoneman Meadow by redesigning the Orchard Parking Lot. Through engineering solutions, Alternative 6 would promote water flow by increasing drainage from the cliff walls of the parking lot to Stoneman Meadows, thus improving meadow health. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, and beneficial impacts on meadow habitat and associated meadow wildlife.

***Former Upper and Lower Rivers Campgrounds:*** Like Alternative 5, specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 6 include restoring the topography of 16.5 acres of the floodplain. Alternative 6 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 6 may include noise associated with restoration activities, human

presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

**Hydrologic/Geologic Resource Actions.** Under Alternative 6, restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6 and mitigate for the scouring effects of Stoneman Bridge by placement of large wood. Additionally, riparian habitat would be restored where needed, and brush layering and a constructed logjam would be placed in the vicinity of the Stoneman Bridge. Drainage in this area would be improved by the addition of culverts. The Sugar Pine and Ahwahnee Bridges would be retained under Alternative 6; however, channel complexity would be enhanced around the bridges by installation of constructed logjams and placement of large wood below Sugar Pine Bridge. The cut off channel before Sugar Pine Bridge would be filled in. Alternative 6 would restore riparian and floodplain habitat through the removal or relocation of infrastructure that constrict the free-flowing condition of the river or are located in sensitive areas and revegetation. Thus, specific actions under Alternative 6 would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that inhabit riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 6 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 6 would maintain kinds and amounts of visitor use and facilities in Yosemite Valley compared to current levels. Overnight accommodations would increase and day parking and transit options would be expanded. Overall, Alternative 6 would accommodate peak use levels during the summer season. Actions related to overnight camping would be similar to those described for Alternatives 4 and 5, with additional expansions. Facility expansions or construction are proposed at Upper Pines Campground, former Lower River Campground, former Upper River Campground, west of Yosemite Lodge, Camp 4, and the area west of Backpackers Campground (although 15 current campsites would be removed from the 100-year floodplain). A new campground would be constructed at Eagle Creek. Additionally, permanent employee housing would be constructed at Yosemite Village and Curry Village. These actions would result in both short- and long-term, minor, adverse impacts on



wildlife in Segment 2 related to increased human disturbance, human-wildlife conflicts, minor habitat loss (most actions would occur in existing disturbed areas), and increased radiating impacts.

In general, visitor activities would be enhanced to promote direct connection to the river. Certain activities that are not part of the recreational ORV would be reduced or discontinued, including commercial stock day rides at the Curry Village Stables (discontinued). Commercial boating opportunities would be available. The Curry Village stables and Yosemite Lodge bicycle stand would remain in service, while the Yosemite Lodge Nature Shop would be repurposed and the Gift Shop would be reduced. The Housekeeping Camp facilities would be retained. Private and commercial boating would be allowed in the Valley and limited to designated areas under a quota system. These actions would have a negligible effect on wildlife in Segment 2.

Day-visitor parking capacity would be expanded and formalized; most day-visitor parking would be provided at existing designated parking areas or in repurposed previously disturbed areas. Actions that would affect wildlife habitat include the construction of new roundabouts at Camp 6, Bank 3-way intersection, and Sentinel crossover and a new pedestrian underpass at the Yosemite Falls intersection. Additionally, the West Valley Overflow Parking Area would be developed south of Southside Drive to meet demand for day use parking in the El Capitan Area of Segment 2. These actions would result in minor habitat loss near existing roadways and other improved areas, resulting in local, long-term, minor impacts on wildlife. In addition, construction activities would result in increased human presence, noise, and potential for sediment discharges immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these impacts to minor and adverse.

**Curry Village & Campgrounds.** Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village, including the construction of 98 hard-sided units, and the rerouting of South Side Drive at Boys Town. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct, temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (**table 9-93**). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow habitat. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-93 below, only a small percentage of these wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts and disturbance. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-93: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 6**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment <sup>b</sup>	1.97	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

**Camp 6 and Yosemite Village.** Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/ Village Center Parking Area would be formalized with 850 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. A pedestrian underpass and two roundabouts (one at the Village Drive/Northside Drive intersection and one at the Sentinel Drive/Northside Drive intersection) would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection would be added at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion.

As noted in **table 9-94**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses would primarily occur in ponderosa pine forest and, to a much lesser extent, montane riparian and wet meadow habitats. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-94**, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 6 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

**TABLE 9-94: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 6**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Riparian	0.81	0.3
Ponderosa Pine	12.22	0.7
Wet Meadow	0.28	0.09
Redevelopment <sup>b</sup>	14.18	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

**Yosemite Lodge and Camp 4.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (table 9-95). Impacts to wildlife habitats would occur in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2, as well as in montane hardwood habitat. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-95, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

**TABLE 9-95: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 6**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	1.73	<0/1%
Ponderosa Pine	15.47	0.9%
Redevelopment <sup>b</sup>	3.69	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 6 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, as shown in table 9-96, actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

**TABLE 9-96: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 6**

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment <sup>a</sup>
<b>Segment 2</b>		
Montane Hardwood	1.73	<0.1%
Montane Riparian	0.81	0.3%
Ponderosa Pine	34.04	1.9%
Wet Meadow	0.31	<0.1%
Redevelopment <sup>b</sup>	19.84	N/A
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. <sup>b</sup> Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Alternative 6 would accommodate an increase in total daily use by approximately 4% compared to total visitors per day who visited the Valley in 2011. Additionally, total day use in the Valley would decrease by 7%, but total overnight visitation would increase by 33%. Increased daily use and overnight use levels in Segment 2 of the Merced River corridor would increase human-related impacts on wildlife, especially during the peak season (summer). Human-wildlife conflicts with certain species, such as black bears, would potentially increase due to the increase in traffic resulting from an increase in total daily use and overnight use. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities.

Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Thus, actions to increase the number of overnight and day visitors in Segment 2 would have segmentwide, long-term, minor to moderate, adverse effects on wildlife. Conversely, actions that remove or reduce certain kinds of visitor use activities would result in local, long-term, negligible to minor, beneficial impacts on wildlife. When these increased accommodations for visitor use are combined with the proposed restoration actions, long-term, minor, adverse impacts on wildlife from human presence and human-related pressures (such as noise, human food availability, wildlife fatalities from traffic, and vegetation trampling) would result in Segment 2.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 under Alternative 6 would result in the restoration of 156 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats and additional use over existing conditions, resulting in long-term, segmentwide, minor, adverse impacts to wildlife.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Actions under Alternative 6 in Segments 3 and 4 would be similar to those described for Alternatives 3–5. The park would designate oak protection areas in the Odgers’ fuel transfer center and parking lots adjacent to the fuel transfer center to improve root health, water uptake, and soil aeration for oak trees. New parking and building construction would be prohibited within the oak protection area. Parking within 10 feet of the base of oak trees would be prohibited. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore valley oak woodland habitat. Habitat restoration actions that would occur in Segment 4 are summarized in table 9-97, and would be the same as proposed for Alternative 5.

**TABLE 9-97: ALTERNATIVE 6 HABITAT RESTORATION IN SEGMENT 4**

Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Foothill broadleaf	1	Valley oak woodland	1
Lower montane broadleaf	11	Lower montane broadleaf	11
<b>Total</b>	<b>12</b>	<b>Total</b>	<b>12</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-97, a total of approximately 12 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities due to increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for habitat and food.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

In Segment 3, Alternative 6 would provide for similar kinds and amounts of use that exist today. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under Alternative 6. In Segment 4, Alternative 6 would introduce additional visitor use with the development of a remote parking area and increase in employee housing throughout

El Portal. These actions would be the same as described for Alternative 4, although housing levels would be somewhat less, resulting in correspondingly less impact related to human disturbance. The addition of a remote parking lot and high-density employee housing would result in an increase in the built environment in Segment 4. Additional human presence and traffic (from park employees and day visitors) would increase disturbance to wildlife and potentially increase human-related pressures on wildlife. Thus, actions to manage visitor use and park facilities would collectively result in local, long-term, minor, adverse impacts on wildlife.

**Segments 3 and 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 and 4 under Alternative 6 would result in the restoration of 12 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

### Segments 5– 8: South Fork Merced River

#### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 6, the same restoration actions are proposed as described for Alternative 5: implementing actions specifically targeted to protect culturally sensitive areas, relocating two stock use campground sites that are within the 100-year floodplain or culturally sensitive areas to the Wawona Maintenance area, and removing some camp sites from the Wawona Campground that are either in culturally sensitive areas or within the 100-year floodplain. Restoration actions that would occur in Segment 7 are summarized in table 9-98, and would be the same as those proposed under Alternative 5.

**TABLE 9-98: ALTERNATIVE 6 HABITAT RESTORATION IN SEGMENT 7**

Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Lower montane needleleaf	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
<b>Total</b>	<b>3</b>	<b>Total</b>	<b>3</b>
Abbreviation: WHR = Wildlife Habitat Relationships <sup>a</sup> Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. <sup>b</sup> Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-98, a total of approximately three acres of riparian habitat would be restored in Segment 7 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The relocation and removal of campsites within the floodplain would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to decreased human presence.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 6 would result in largely the same effects on wildlife as described for Alternative 4 in Segments 5, 6, and 8. While recreation-related activities would be somewhat higher than under this alternative, Segments 5, 6, and 8 do not experience as much concentrated use and effects on wildlife would be negligible.

Alternative 6 proposes the same management actions as Alternative 5 in Segment 7. The Wawona Golf Course and Store and the Wawona Hotel tennis courts would remain under Alternative 6. Commercial day rides would continue, and private boats would be allowed in Segment 7. Overnight capacities at the Wawona Campground would remain essentially unchanged, with the exception of campsites that would be removed due to impacts to archeological resources and two campsites at the Wawona stock camp that would be relocated to the Wawona stables. Day parking capacity would not deviate from Alternatives 2–5.

Daily use levels associated with Segment 7 under Alternative 6 would be similar to Alternative 3–5. The reduction in day use and total daily visitor numbers would reduce human-related pressures on wildlife in general. A slight reduction in overnight capacities would result in short-term, adverse impacts on aquatic and terrestrial wildlife, including noise associated with demolition, removal, and restoration activities; ground disturbance; effects associated with human presence; habitat modification; and potential increase in suspended sediments to the South Fork Merced River in Segment 7. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long term, removal of some campsites at the Wawona Campground and relocation of the stock use campsites would allow for habitat restoration, which would benefit wildlife. Continued operation of the park facilities in the Segment 7 would continue to contribute to the total built environment in Segment 7 of the river corridor. Combined actions in Alternative 6 would restore some riparian habitat and reduce riverbank erosion, slightly reduce the overall built environment, and reduce human presence and human-related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, minor, beneficial impacts on wildlife.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 6 would result in the restoration of three acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.



### Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

Under Alternative 6, the park would provide additional peak season capacity for visitors while restoring habitat for fish and wildlife. This includes actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 170 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 6, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions under Alternative 6 include the following:

- Remove selected facilities within the 100-year floodplain of the Merced River and restore targeted areas of riverbanks, meadows, and riparian habitat; restoration of habitat would be achieved through passive and active restoration techniques and through design and engineered solutions.
- Redirect recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage for the increase in total daily visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Construct new overnight accommodations to compensate for those removed for restoration activities; expand overnight accommodations above existing conditions.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats. Alternative 6 would accommodate additional peak visitor use in the Valley. Thus, human-related pressures to wildlife and wildlife habitat would also increase. In addition, the construction of new parking, transportation improvements (roundabouts), and campground areas would result in both short- and long-term, adverse effects on wildlife. Adverse effects from Alternative 6 associated with restoration activities would be limited to the construction or restoration phase, and would be local, short term, and minor or negligible. The long-term effect of these measures would collectively be minor and adverse on fish and wildlife as human-related pressures continue to increase and affect habitat quality. Like Alternatives 2-5, these effects would be most prominent in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

## **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The past, present, and reasonably foreseeable actions used for evaluating Alternative 6 are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. The restoration actions under Alternative 6 would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions would be focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species associated with these habitat types would be most likely to be affected cumulatively by the proposed actions. Actions that would retain current facilities or services and construct new facilities would generally contribute to adverse impacts on fish and wildlife in the river corridor over the long term. Because actions under Alternative 6 would allow for higher amounts of visitor use, more park facilities and services would be retained within the floodplain of the river. Additionally, new or extended parking spaces, roadway improvements, and campsites would be constructed to accommodate increase in visitor demand for day parking and camping opportunities.

As described previously, wildlife communities have been manipulated by human development and population growth throughout the region for decades, and these actions have negatively influenced wildlife and wildlife habitat. In total, regional development and growth would contribute towards a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. When these effects are combined cumulatively with the effects of restoration projects and other actions in Alternative 6, conditions for fish and wildlife populations in the study area would remain the same or slightly worsen over time. While the cumulative contribution associated with Alternative 6 would be minor and adverse, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative, would also be long term, minor, and adverse.

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## **Special Status Species**

### ***Affected Environment***

Special status species are plants and animals that are legally protected under the federal Endangered Species Act (ESA) of 1973 or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such status. Additional federal regulations protect special status species, including the Fish and Wildlife Coordination Act of 1934 (as amended), the Bald Eagle and Golden Eagle Protection Act, and the Migratory Bird Treaty Act. These are discussed in more detail in the paragraphs that follow.

The California ESA, administered by the California Department of Fish and Game [CDFG], does not supersede the federal ESA, but operates in conjunction with it to provide additional protection to threatened and endangered species in California, as well as species that are not protected through federal regulations. In addition to threatened and endangered state-listed species, the CDFG maintains an informal list of plant and wildlife species of special concern because of population declines and restricted distributions, and/or because they are associated with habitats that are declining in California. The California Native Plant Society (CNPS) has also developed lists of plants of special concern in California. The National Park Service (NPS) makes every reasonable effort to conduct its actions in a manner consistent with relevant state laws and regulations, per NPS policy.

## **Regulations and Policies Pertaining to Special Status Species**

### ***Federal Laws and Regulations***

*Endangered Species Act.* The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over species formally listed as threatened or endangered under the ESA (16 USC 1531–1544). An endangered species is one that is considered in danger of becoming extinct throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future. In addition to endangered and threatened species, which are legally protected under the ESA, there are lists of candidate species for which the USFWS currently has enough information to support a proposal for listing as threatened or endangered species.

Section 7 of the ESA outlines procedures for federal interagency cooperation to conserve federally listed species and designated critical habitat. The NPS is required to consult with USFWS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species. This consultation may be either informal or formal consultation. Under a formal consultation, the USFWS issues a biological opinion. Section 9 of the ESA prohibits the “take” of federally listed species, which is broadly defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” The biological opinion generally describes some level of incidental take, and details reasonable and prudent measures that the action agency needs to implement to ensure that critical habitat is not destroyed or degraded and that a listed species is not jeopardized by the federal action. The USFWS has interpreted the definition of “harm” to include significant habitat modification. An activity may be defined as a take even if it is unintentional or accidental.

*Migratory Bird Treaty Act.* The Migratory Bird Treaty Act, which was first enacted in 1918, implements a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and Russia, which provide for international migratory bird protection and authorize the Secretary of the Interior to regulate the take of migratory birds. There is a list of bird species that are protected by the Migratory Bird Treaty Act. The act makes it unlawful, except as allowed by regulations, “at any time, by any means, or in any manner, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird, included in the terms of conventions” with certain other countries (16 USC 703). This includes direct and indirect acts, although harassment and habitat modification are not included unless they result in the direct loss of birds, nests, or eggs.

*Bald and Golden Eagle Protection Act.* The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle’s return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

*Fish and Wildlife Coordination Act.* The Fish and Wildlife Coordination Act (16 USC 661–667e, March 10, 1934, as amended 1946, 1958, 1978, and 1995) requires federal agencies to consult with USFWS, National Marine Fisheries Service (NMFS), and the CDFG before they undertake or approve projects that control or modify surface water. The consultation is intended to prevent the loss of or damage to fish and wildlife in connection with water projects and to develop and improve these resources. Compliance with this act is incorporated into a project’s National Environmental Policy Act (NEPA) process.

*Executive Order 13186—Responsibilities of Federal Agencies to Protect Migratory Birds.* Executive Order (EO) 13186 directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. EO 13186 creates a more comprehensive strategy for the conservation of migratory birds by the federal government, and fulfills the government’s duty to lead in the protection of this international resource. EO 13186 also provides a specific framework for the federal government’s compliance with its treaty obligations to Canada, Mexico, Russia, and Japan and provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in memoranda of understanding. For example, EO 13186 aids in incorporating national planning for bird conservation into agency programs and provides the formal presidential guidance necessary for agencies to incorporate migratory bird conservation more fully into their programs.

*National Park Service Regulations and Policies.* Servicewide NPS regulations and policies, including the NPS Organic Act of 1916, *NPS Management Policies 2006* (NPS 2006), and the NPS Natural Resource Management Reference Manual 77, direct national parks to provide for the protection of park resources. The Organic Act directs national parks to conserve “wild life” unimpaired for future generations and is interpreted to mean that native animal and plant life is to be protected and perpetuated as part of a park unit’s natural ecosystem.

The *NPS Management Policies 2006* state that the NPS “will maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems.” The term “plants and animals” refers to all five of the commonly recognized kingdoms of living things and includes such groups as flowering plants, ferns, mosses, lichens, algae, fungi, bacteria, mammals, birds, reptiles, amphibians, fishes, insects, worms, crustaceans, and microscopic plants or animals” (NPS 2006). The NPS will achieve this by:

- preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur
- restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions
- minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them (NPS 2006)

Section 4.1 of *NPS Management Policies 2006* states that “natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities. The Service will not attempt to solely preserve individual species (except threatened or endangered species) or individual natural processes; rather, it will try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems” (NPS 2006). According to section 8.2.2.1 of the *NPS Management Policies 2006*, “Superintendents will develop and implement visitor use management plans and take action, as appropriate, to ensure that recreational uses and activities in the park are consistent with its authorizing legislation or proclamation and do not cause unacceptable impacts on park resources or values” (NPS 2006).

Overall, goal of the NPS is to minimize human impacts (including impacts on individual wildlife) and avoid significant effects from disturbance to the abundance, diversity, dynamics, distributions, habitats, and behaviors of wildlife populations and communities and ecosystems in which they occur, pursuant to 36 CFR 2.18 and *NPS Management Policies 2006*, section 4.4.1. Although the focus of the impact analysis is predominantly the impacts on wildlife populations, the NPS acknowledges that adverse impacts on individual animals would likely occur and seeks to minimize them. In addition to NPS management policies, federally listed species in national parks are protected by the ESA, which mandates all federal agencies consider the potential effects of their actions on species listed as threatened or endangered (16 USC 1531 et seq.). If the NPS determines that an action may affect a federally listed species, consultation with the USFWS is required to ensure that the action would not jeopardize the species’ continued existence or result in the destruction or adverse modification of critical habitat. *NPS Management Policies 2006* state that the NPS will survey for, protect, and strive to recover all species native to NPS units that are listed under the ESA, and proactively conserve listed species and prevent detrimental effects on these species (NPS 2006, section 4.4.2.3). *NPS Management Policies 2006* also state that “[the NPS will] manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible” (NPS 2006, sec. 4.4.2.3).

### *State Laws and Regulations*

*California Endangered Species Act.* Pursuant to the California ESA, which is administered by the CDFG, state-listed threatened or endangered species are protected from any take (California Code of Regulations [CFR], title 14, sections 670.2 and 670.5; California ESA, section 2080). The California ESA is similar to the federal ESA both in process and substance; it is intended to provide additional protection to threatened and endangered species in California. The California ESA does not supersede the federal ESA but operates in conjunction with it. Species may be listed as threatened or endangered under both acts (in which case the provisions of both state and federal laws apply) or under only one act. The take of state-listed species incidental to otherwise lawful activities requires an incidental take permit.

*California Native Plant Protection Act.* In addition to the California ESA, the California Native Plant Protection Act provides protection to endangered and rare plant species, subspecies, and varieties of wild native plants in California. The definitions of “endangered” and “rare” closely parallel the definitions of “endangered” and “threatened” plant species in the California ESA. The California Native Plant Protection Act lists are used by both the CDFG and the USFWS when considering formal species protection under the ESA and the California ESA.

*California Fish and Game Code, Protection of Birds.* The California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird (section 3503). Specifically, it is unlawful to take, possess, or destroy any raptors (i.e., eagles, hawks, owls, and falcons), including their nests or eggs (section 3503.5). The code adopts the provisions of the Migratory Bird Treaty Act and states that it is unlawful to take or possess any designated migratory nongame bird or any part of such migratory nongame bird (section 3513). The state code offers no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of nongame migratory birds. Typical violations include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of the code could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction.

This Merced Wild and Scenic River Comprehensive Management Plan (Merced River Plan) is consistent with California laws and regulations, including those protecting state-listed threatened and endangered species. For this reason, species listed under the California ESA or accorded special status by the CDFG (i.e., considered rare or sensitive and monitored by the California Natural Diversity Database) are included in this analysis.

### *Informal Species Designations*

Yosemite National Park recognizes state and local rare and sensitive plant species, and in addition maintains its own list of park sensitive plant species. These species include those that may have extremely limited distributions, represent relict populations from past climatic or topographic conditions, have unique adaptations to local conditions, may be at the extreme extent of their range in the park, or may be listed by the California Native Plant Society or the California Natural Diversity Database as rare or sensitive. Park sensitive species are included in this analysis because they could be affected (due to proximity to human-use zones or susceptibility of individual plants or populations to



loss from natural or unnatural events), and their existence is considered when evaluating consequences for any proposed management action.

The CNPS is a professional society of plant biologists, scientists, and associated professionals which has accumulated a statewide database on California native plants and their distributions. The CNPS has created five categorical rankings of plants to identify their respective concern for these species as potentially rare, threatened, or endangered species. These listings do not afford legal status or protection for these species, but the lists are used by agencies in their planning processes for activities that could affect the species or habitat. Vascular plants listed as rare or endangered by the CNPS (CNPS 2012) are defined as follows:

1. California Rare Plant Rank 1A – Plants presumed extinct in California
2. California Rare Plant Rank 1B – Plants rare, threatened, or endangered in California and Elsewhere
3. California Rare Plant Rank 2 – Plants rare, threatened, or endangered in California, but More Common Elsewhere
4. California Rare Plant Rank 3 – Plants about which we need more information – a review list
5. California Rare Plant Rank 4 – Plants of limited distribution – a watch list

In general, plants listed by CNPS as Rank 1A, 1B, or 2 meet the definition of section 1901, chapter 10 (Native Plant Protection Act) and sections 2062 and 2067 (CESA) of the California Fish and Game Code as rare or endangered species.

### **Special Status Plant Species**

For purposes of this analysis, special status plant species are defined as those listed by the USFWS as endangered, threatened, proposed, or candidate species; those identified by the CDFG as an endangered, threatened, or rare species; those identified by Yosemite National Park as sensitive; or those listed by the CNPS as Rank 1A, 1B, or 2.

Based on this broad information and professional judgment on the part of park staff, the NPS prepared a list of those special status plant species that could potentially occur within the boundaries of the park. Park staff then reduced the list to only those special status species that are known to occur, or have the potential to occur, in the study area and that could be affected by actions proposed in the alternatives. Based on this updated list, previous studies, recent surveys, and professional judgment by the park staff, 50 special status plant species are known to occur or have the potential to occur in the project vicinity.

The NPS recently completed a report entitled *Special Status Plant Species in the Merced River Corridor within Yosemite National Park (Special Status Plant Species Report)* (Colwell and Taylor 2011b), which summarizes the results of targeted botanical surveys undertaken in the following areas of high human impact along the Merced River corridor within Yosemite National Park: Merced Lake, Little Yosemite Valley, Yosemite Valley, El Portal, and Wawona. In preparing the report, NPS staff reviewed prior plant studies within the park, identified gaps in existing data and, in order to fill those gaps, undertook

plant surveys across four areas: Merced Lake, Little Yosemite Valley, El Portal Administrative Site, and Wawona. The surveys were conducted in the summer and fall of 2010 and the spring of 2011. The report was published in May 2011.

Botanical surveys have identified no federally listed and two state-listed plants within the Merced River corridor in Yosemite.

The *Special Status Plant Species Report* (Colwell and Taylor 2011b) concluded that the characteristic pattern of special status species occurrence along the Merced River corridor within Yosemite was found to be within unique habitat types that are often restricted in size. These habitat types are typically associated with specific kinds of water availability, such as waterfall spray zones, braided river channel oxbow cutoffs, gravel bars resulting from periodic flooding, water seepage on rock walls, vernal pools resulting from snowmelt flooding, and the average high water margin of streams and rivers. Common threats to special status plant species and their habitats include trampling and invasive species encroachment. Other adverse impacts on special status plant species within Yosemite include human activity at the Merced Lake High Sierra Camp; changed hydrology as a result of past wetland draining, removal of natural dams, ditching, and piping; and landscaping (transplanting wild plants to landscaping areas).

#### *Federal Special Status Plant Species*

The NPS initiated consultation with the USFWS and obtained an updated species list from the USFWS on June 27, 2012. Based on this list and professional judgment by the park staff, one federally listed candidate species has been identified as known to occur or as having the potential to occur in the areas under consideration in this plan: whitebark pine. Consultation with the USFWS will continue throughout the environmental compliance process for the Merced River Plan, and the NPS will consult with the USFWS to obtain an updated list of federally endangered or threatened species and complete the consultation process prior to project implementation.

#### *State of California Special Status Species*

Of the 50 special status plant species known to occur or having the potential to occur in the areas under consideration in this plan, three are listed by the State of California as Rare (see **table 9-99**).

Table 9-99 presents the 50 special status plant species known to occur or having the potential to occur within the park's Merced River corridor. The table provides information regarding species designation, habitat requirements, and potential location within the study area. Data regarding the latter two elements are generally drawn from the *Special Status Plant Species Report* (Colwell and Taylor 2011b). Locations of potential occurrence are estimated based on recorded observations and best professional judgment of NPS biologists.

**TABLE 9-99: SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Segment(s) with Potential for Species to Occur
<b>Plants and Fungi</b>			
<i>Antirrhinum leptaleum</i> Spurred snapdragon	SSP	Small washes, shallow ditches, disturbed areas, in foothill woodland, yellow pine forest; historic collection from Wawona; elevations between 300 meters-2,100 meters	7
<i>Asarum lemmonii</i> Lemmon's wild ginger	SSP	Shady wet places along creeks, north-facing river banks; Yosemite Valley, Wawona; elevations between 1,100 meters-1,900 meters	2,7
<i>Bolandra californica</i> California bolandra	SSP/4.3	Lower and upper montane coniferous forest, mesic, rocky shaded places; Lyell Fork Merced River; elevations between 2,000 meters-3,000 meters	1
<i>Bulbostylis capillaris</i> Threadleaf beakseed	SSP/4.2	Meadows and seeps, meadow habitats, vernal moist gravel pans; Yosemite Valley; elevations between 1,000 meters-2,000 meters	2
<i>Camissonia sierrae</i> ssp. <i>alticola</i> Mono Hot Spring evening primrose	SSP/1B.2	On vernal moist gravel and sand pans; Merced Lake; elevations between 2,000 meters-2,350 meters	1
<i>Camissonia sierrae</i> ssp. <i>sierrae</i> Sierra suncup	SSP/4.3	Granite gravel seepage areas; Yosemite Valley; elevations between 500 meters-1,300 meters	2
<i>Carex buxbaumii</i> Buxbaum's sedge	SSP/4.2	Montane and subalpine fens; coastal prairie, yellow pine forest, red fir forest, lodgepole forest, subalpine forest, meadows and seeps, wet conditions in meadow habitats. Yosemite Valley; elevations between 1,200 meters-3,300 meters	2
<i>Carex canescens</i> Silvery sedge	SSP	Lake margins, drainages in wet meadows; historic collection from Clark's Wawona; elevations between 1,000 meters-3,200 meters	7
<i>Carex fissuricola</i> Cleft sedge	SSP	Meadow slopes and flats, among rocks, wet areas, spray zones; Nevada Fall; elevations between 1,500 meters-3,500 meters	1
<i>Carex sartwelliana</i> Yosemite sedge	SSP	Moist forest openings and meadow borders; Wildcat Creek; elevations between 1,200 meters-2,600 meters	1,2,5,7
<i>Carex tompkinsii</i> Thompkins' sedge	SSP/4.3/ Rare	Canyon slopes and river bottomlands under conifer-oak woodland canopy; El Portal area; elevations between 1,200 meters-1,800 meters	4
<i>Cinna bolanderi</i> Bolander's woodreed	SSP/1B.2	Montane stringer meadows and fens; Wawona and Little Yosemite Valley; elevations between 1,670 meters-2,440 meters	1,7
<i>Collinsia linearis</i> Narrow leaf collinsia	SSP	Rocky, metamorphic substrates of broad-leaved upland forest, chaparral, cismontane woodland; El Portal & Wawona; elevations between 200 meters-2,000 meters	4,7

**TABLE 9-99: SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA (CONTINUED)**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Segment(s) with Potential for Species to Occur
<b>Plants and Fungi (cont.)</b>			
<i>Cordylanthus rigidus</i> ssp. <i>brevibracteatus</i> Short-bracted bird's beak	SSP/4.3	North side Yosemite Valley, dry sandy roadside full sun, 1 mile east of Cascade Creek; elevations between 1,100 meters-2,500 meters	2
<i>Cypripedium montanum</i> Mountain lady's slipper	SSP/4.2	Deep humus and shade of canyon bottoms; Wawona and below Yosemite Valley; elevations between 200 meters -2,200 meters	3,7
<i>Epipactis gigantea</i> Stream orchid	SSP	Moist conditions in meadows, streambank habitats and cliff basins; Yosemite Valley; elevations between 1,500 meters-2,600 meters	2
<i>Eriophyllum congdonii</i> Congdon's woolly sunflower	SSP/1B.2/ Rare	Sunny rocky slopes on metamorphic talus; next to river in El Portal; elevations between 500 meters-1,900 meters	4
<i>Erythronium purpurascens</i> Purple fawnlily	SSP	Open forests, meadows, rocky places; Yosemite Valley - possibly extinct; elevations between 1,500 meters-2,700 meters	2
<i>Glyceria borealis</i> Northern mannagrass	SSP	Marshes and shallow lake borders; Yosemite Valley; elevations between 800 meters-1,250 meters	2
<i>Helianthus californicus</i> California sunflower	SSP	Meadows, seeps, streambanks, seasonally inundated areas; Wawona; elevations between 1,600 meters-2,000 meters.	7
<i>Hippuris vulgaris</i> Common mare's tail	SSP	Lakes, ponds, springs, rivers. Little Yosemite Valley; elevations between 0 meters-2,600 meters	1
<i>Hulsea heterochroma</i> Redray alpinegold	SSP	Chaparral, openings in yellow pine forest, Yosemite Valley, 5 miles above Nevada Fall; elevations between 300 meters-2,500 meters	1,2
<i>Isoetes occidentalis</i> Western quillwort	SSP	Mountain lakes and rivers; in Merced River Little Yosemite Valley; elevations between 1,500 meters-2,500 meters	1
<i>Leucothoe davisiae</i> Sierra laurel	SSP	Moist, shaded drainage bottoms along creeks and rivers; Yosemite Valley; elevations between 1,300 meters-2,600 meters	2
<i>Lewisia congdonii</i> Congdon's lewisia	SSP/1B.3/ Rare	Lower montane coniferous forest, metamorphic cliffs; El Portal; elevations between 500 meters-2,800 meters	4
<i>Lindernia dubia</i> var. <i>anagallidea</i> False pimpernel	SSP	Exposed margins of lakes and ponds, mudflats; Yosemite Valley; elevations between 500 meters-1,600 meters	2
<i>Lithocarpus densiflorus</i> var. <i>echinoides</i> Tanoak	SSP	Dry shady forest conditions in slope habitats; Merced River below Yosemite Valley; elevations between 600 meters-2,000 meters	2,3

**TABLE 9-99: SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA (CONTINUED)**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Segment(s) with Potential for Species to Occur
<b>Plants and Fungi (cont.)</b>			
<i>Lycopus uniflorus</i> Northern bugleweed	SSP/4.3	Moist areas, marshes, near springs; Merced River banks from El Portal up; elevations between 1,600 meters-2,000 meters	3,4
<i>Mimulus bicolor</i> Yellow and white monkeyflower	SSP	Occurs under vernal moist conditions; usually in nonwetlands, but occasionally found on wetlands & river bottomlands; Wawona; elevations between 360 meters-2,100 meters	7
<i>Mimulus inconspicuus</i> Small flowered monkeyflower	SSP/4.3	Chaparral, cismontane woodland, lower montane coniferous forest, mesic, shady areas; mouth of Moss Creek; elevations between 160 meters-2,000 meters	2,3,7,8
<i>Mimulus laciniatus</i> Cutleaf monkeyflower	SSP/4.3	Chaparral, lower and upper montane coniferous forest, mesic areas of granitic substrate, vernal moist seepage areas; Yosemite Valley; elevations between 900 meters-2,000 meters	2
<i>Mimulus pulchellus</i> Yellowlip pansy monkeyflower	SSP/1B.2	Lower montane coniferous forest, vernal mesic meadows; Yosemite Valley; elevations between 600 meters-2,000 meters	2
<i>Myrica hartwegii</i> Sierra sweet bay	SSP	Stream and riverbanks; Along Merced below Wawona; elevations between 300 meters-1,500 meters	7,8
<i>Narthecium californicum</i> California bog asphodel	SSP	Fens, seeps; occurs under wet conditions by streams and waterfalls; Bridalveil Fall; elevations between 700 meters-2,600 meters	2
<i>Penstemon azureus ssp. angustissimus</i> Azure penstemon	SSP	Chaparral, Yellow Pine Forest, Sagebrush Scrub, Foothill Woodland; occurs under dry conditions in slope habitats; Yosemite Valley; elevations between 300 meters-700 meters	2
<i>Penstemon heterophyllus</i> var. <i>purdyi</i> Purdy's foothill penstemon	SSP	chaparral, foothill woodland, yellow pine forest; occurs under dry conditions in slope habitats; Yosemite Valley; elevations between 50 meters-1,600 meters	2
<i>Phacelia tanacetifolia</i> Tansy leafed phacelia	SSP	Habitat variable, occurs in slope habitats; Bridalveil Falls, Yosemite Valley; elevations between 1,000 meters-2,000 meters	2
<i>Pinus albicaulis</i> Whitebark pine	FC	Cold, windy high elevation sites between 3,000 meeters-3,750 meters	1
<i>Piperia colemanii</i> Coleman's piperia	G3/4.3	Chaparral, lower montane coniferous forest; Little Yosemite Valley; elevations between 1,200 meters-2,300 meters	1
<i>Plagiobothrys torreyi</i> var. <i>torreyi</i> Torrey's popcornflower	SSP/1B.2	Moist meadows and flats, forest edges; Yosemite Valley; elevations between 1,200 meters-3,400 meters	2

**TABLE 9-99: SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA (CONTINUED)**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Segment(s) with Potential for Species to Occur
<b>Plants and Fungi (cont.)</b>			
<i>Potamogeton epihydrus</i> ssp. <i>nuttallii</i> Nuttall's pondweed	SSP/2.2	Freshwater marshes, tanks; Yosemite Valley; elevations between 400 meters-1,900 meters	2
<i>Quercus lobata</i> Valley oak	SSP	Deep soil on slopes and in valleys; one small population occurs in El Portal; elevation 720 meters	4
<i>Saxifraga mertensiana</i> Wood saxifrage	SSP	Mossy rocks, cliffs; Yosemite Valley; elevations between 1,000 meters-2,500 meters	2
<i>Saxifraga oregana</i> Oregon saxifrage	SSP	Meadows and seeps; occurs under wet conditions in meadow habitats; Yosemite Valley & Little Yosemite Valley; elevations between 150 meters-2,500 meters.	1,2
<i>Scutellaria bolanderi</i> ssp. <i>bolanderi</i> Sierra skullcap	SSP	Gravelly soils, stream and riverbanks, meadows in oak or pine woodland; Wawona; elevations between 300 meters-2,000 meters	7
<i>Senecio clarkianus</i> Clark's ragwort	SSP	Damp montane meadows; Wawona; elevations between 1,400 meters-2,700 meters	7
<i>Sparganium natans</i> Small bur reed	SSP/4.3	Freshwater wetlands, in lake margin and edge habitats, tanks in meadows; tributaries of Merced River; elevations between 2,000 meters- 2,500 meters	2,7
<i>Staphylea bolanderi</i> Sierra bladder nut	SSP	chaparral, foothill woodland, yellow pine forest; occurs in shaded canyon habitats; Merced River Canyon in El Portal; elevations between 240 meters-1,720 meters	3,4
<i>Trillium angustipetalum</i> Narrowpetal wakerobin	SSP	Shaded bottomlands; Wawona, Yosemite Valley; elevations between 100 meters-2,000 meters	2,7
<i>Vaccinium parvifolium</i> California red huckleberry	SSP	Moist, shaded drainage bottoms along creeks and rivers; South Fork Merced River Wawona area; elevations between 1,400 meters- 2,500 meters	7
<i>Wyethia elata</i> Hall's mule ears	SSP/4.3	Open woodland, forest; Wawona; elevations between 1,000 meters-1,400 meters	7
<p>Abbreviations: CNPS = California Native Plant Society; SSP = special status species</p> <p>STATUS: Rare = Designated as rare by the State of California SSP = Park Designated Special Status Species</p> <p>CNPS RANKINGS: List 1A = Plants presumed extinct in California List 1B = Plants Rare, Threatened, or Endangered in California and Elsewhere List 2 = Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere List 3 = Need more information</p> <p>Source: Special Status Plant Species in the Merced River Corridor within Yosemite National Park (Colwell and Taylor 2011b)</p>			
		<p>List 4 = Plants of Limited Distribution Threat Ranks: .1 = Seriously endangered in California .2 = Fairly endangered in California .3 = Not very endangered in California</p>	

## Special Status Wildlife Species

For the purposes of this analysis, special status wildlife species are defined as those listed by the USFWS as an endangered, threatened, proposed, or candidate species; or identified by the CDFG as an endangered, threatened, or candidate species; or a CDFG species of special concern or fully protected species.

Based on this broad information and professional judgment on the part of Yosemite National Park staff, the NPS prepared a list of those special status wildlife species that could possibly occur within the boundaries of the park. Park staff then reduced the list to only those special status species that are known to occur, or have the potential to occur, in the study area and that could be affected by actions proposed in the alternatives. Based on this updated list, previous studies, recent surveys, and professional judgment by the park staff, 33 special status wildlife species are known to occur or have the potential to occur in the study area: 1 invertebrate species (beetle), 1 fish species, 3 amphibian species, 14 bird species, and 14 mammal species.

The NPS recently completed a report entitled *Special Status Wildlife Species Report for the Merced River Corridor in Yosemite National Park* (NPS 2011a), which summarizes the current state of knowledge regarding special status wildlife species within the Merced River corridor. The report includes observations from scientific studies, surveys, and reports from park staff and members of the public. Drawing from data spanning the period 1915 to 2011, the report describes the general distribution, habitat requirements, documented observations, and known threats to all special status wildlife species known or have the potential to occur within the Merced River corridor within the study area. The report was published in May 2011 and represents the most current and complete assessment of its kind for the Merced River corridor.

Wildlife populations and habitats in Yosemite have been affected by human activities and development. For some special status wildlife species, reasons for species decline are known and documented. For example, decline of Sierra Nevada bighorn sheep at the Sierra crest is historically due to overhunting and, more recently, to exposure to diseases that all domestic sheep carry that fatally infect the bighorn sheep. For other special status wildlife species such as the Pacific fisher, not enough information is available to determine causative factors of decline. A common threat among special status wildlife species that is within the purview of the NPS to manage is the presence of nonnative species. Nonnative species such as the smallmouth bass, signal crayfish, bullfrog, and nonnative trout have a substantial impact on native species inhabiting aquatic or riparian habitats (NPS 2011a). Other common threats within the purview of the NPS to manage include altered fire regimes, recreational activities and administrative activities, park infrastructure and development, and water withdrawals from the river. Common threats that are not wholly within the purview of the NPS to manage include anthropogenic climate change, air pollution, regional habitat fragmentation or loss, diseases, and human disturbance.

### *Federal Special Status Wildlife Species*

The NPS initiated informal consultation with the USFWS and obtained an updated species list from the USFWS on June 27, 2012. Based on this list and professional judgment by the park staff, six federally listed threatened, endangered, proposed, or candidate species have been identified as known



to occur or as having the potential to occur in the areas under consideration in this plan: one invertebrate species (valley elderberry longhorn beetle), two amphibian species (Yosemite toad and Sierra Nevada yellow-legged frog), and three mammal species (California wolverine, Pacific fisher, and Sierra Nevada bighorn sheep) (see table 9-100). Consultation with the USFWS will continue throughout the environmental compliance process for the Merced River Plan, and the NPS will consult with the USFWS to obtain an updated list of federally endangered or threatened species and complete the consultation process prior to project implementation.

**TABLE 9-100: SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA**

Scientific Name Common Name	Listing Status: Federal/State	General Habitat	Potential to Occur in Study Area Segment
<b>Invertebrates</b>			
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	FT	Breeds and forages exclusively on elderberry shrubs ( <i>Sambucus</i> spp.) typically associated with riparian forests, riparian woodlands, elderberry savannas, and other Central Valley and foothill habitats below 3,000 feet in elevation.	3,4
<b>Fish</b>			
<i>Mylopharodon conocephalus</i> Hardhead	CSC	Inhabits larger middle- and low elevation streams and rivers, from sea level to 4,750 feet in elevation. Typically found in undisturbed streams with clear, deep pools that have sand-gravel-boulder substrates and slow water velocities.	4,6,7
<b>Amphibians</b>			
<i>Hydromantes platycephalus</i> Mount Lyell salamander	CSC	Occurs in massive rock areas between 4,000 feet and 12,139 feet in elevations, in rock fissures, seeps, shade, and low-growing plants. Commonly found in talus slopes of granite where water is flowing. Also found near streams and within the spray zones of waterfalls, under rocks and moss.	1,2,5
<i>Anaxyrus canorus</i> Yosemite toad	FC/CSC	Restricted to wet mountain meadows, lakes, ponds, and shallow spring channels in the central high Sierra Nevada, between elevations of 6,400 feet–11,200 feet. Wet meadow habitat is the focal habitat for this species	1,5
<i>Rana boylei</i> <sup>a</sup> Foothill yellow-legged frog	CSC	Primarily found in streams with riffles, rocky substrates, and open banks from sea level to 6,390 feet in elevation.	2,3,4,6,7,8
<i>Rana sierrae</i> Sierra Nevada yellow-legged frog	FC/CT/CSC	Inhabits high mountain lakes, ponds, tarns and streams at elevations ranging from 4,000 to 12,500 feet; rarely found more than 3 feet from water.	1,5
<b>Reptiles</b>			
<i>Emys marmorata</i> <sup>a</sup> Western pond turtle	CSC	Inhabits a wide range of permanent and ephemeral aquatic habitats, including ponds, marshes, rivers, streams, and ditches to an elevation of about 6,700 feet, but are uncommon anywhere above 5,000 feet. Prefers open, grassy south-facing slopes for nest sites.	2,3,4,6,7,8

**TABLE 9-100: SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA (CONTINUED)**

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in Study Area Segment
<b>Birds</b>			
<i>Histrionicus histrionicus</i> Harlequin duck	CSC	Breeds along large, swift-moving mountain rivers with vegetated banks for cover. At the end of the breeding season, they move back to the coast, where they forage in intertidal areas.	1-8
<i>Accipiter gentilis</i> Northern goshawk	CSC	Favors moderately dense coniferous forests broken by meadows and other openings, between 5,000 feet and 9,000 feet in elevation. Typically nests in mature conifer stand near streams. Forages in mature and old-growth forests that have relatively dense canopies and open understories, but also hunts among a variety of vegetative cover, including meadow edges.	1,5
<i>Aquila chrysaetos</i> Golden eagle	CFP	Forages in open terrain such as grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats; nests in canyons and large trees in open habitats. In the Sierra Nevada, golden eagles favor grasslands and areas of shrubs or saplings, and open-canopied woodlands of young blue oaks.	1-8
<i>Circus cyaneus</i> Northern harrier	CSC	Favors open areas such as grasslands, meadows, wetlands, and agricultural clearings. Rarely seen migrant in that passes through Yosemite.	2,7
<i>Haliaeetus leucocephalus</i> Bald eagle	FD/CE/CFP	Nests in tall trees, usually over 100 feet in height, or on cliffs, usually near water. Favor lakes and rivers with abundance prey (mostly fish).	2,3,4,7
<i>Falco peregrinus</i> Peregrine falcon	CFP	Nests on vertical cliff habitat, with large potholes or ledges, that is inaccessible to land predators. Hunts in a wide variety of habitats including meadows, woodlands, marshes, and mudflats.	1,2,3,5,7
<i>Asio otus</i> Long-eared owl	CSC	In the Sierra Nevada, found from blue oak savannah up to ponderosa pine and black oak habitats, usually in association with riparian habitats.	2,3,4,5,6,7,8
<i>Strix nebulosa</i> Great gray owl	CE	Entire California population of this species is restricted to the Yosemite region. Breeds in mixed conifer/red fir forests bordering meadows. Winters in mixed conifer down to blue oak woodlands.	2,7
<i>Strix occidentalis occidentalis</i> California spotted owl	CSC	Strongly associated with areas of mature and old forest with thick dense canopy closure that contains many dense, old, live trees and snags and fallen logs.	1,2,3,5,7
<i>Chaetura vauxi</i> Vaux's swift	CSC	Inhabits montane-hardwood and Douglas-fir habitats. Uses large hollow trees and snags, especially tall, burned-out stubs for nest sites. Breeding occurs in Yosemite Valley, usually in forested habitat near meadows.	2,3,7,8
<i>Cypseloides niger</i> Black swift	CSC	In Yosemite, only nests near or behind waterfalls, though elsewhere in their range nests are found on sea cliffs or other sheer rock faces.	2

**TABLE 9-100: SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA (CONTINUED)**

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in Study Area Segment
<b>Birds (cont.)</b>			
<i>Contopus cooperi</i> Olive-sided flycatcher	CSC	Breeds in montane and northern coniferous forests, at forest edges and openings, such as meadows and ponds. Winters at forest edges and clearings where tall trees or snags are present.	1,2,5,7
<i>Empidonax traillii</i> Willow flycatcher	CE	Breeds in moist, shrubby areas, often with standing or running water. Winters in shrubby clearings and early successional growth. Deciduous trees and shrubs interspersed with open areas enhances the quality of foraging habitat.	2,6,7
<i>Setophaga petechia</i> Yellow warbler	CSC	Prefers riparian woodlands but also breeds in chaparral, ponderosa pine, and mixed conifer habitats with substantial amounts of brush.	1-8
<b>Mammals</b>			
<i>Sorex lyelli</i> Mount Lyell shrew	CSC	Found primarily in wetland communities, near streams, in grassy areas, under willows, and in sagebrush steppe communities. Requires moist soil and uses logs, stumps, and other surface objects for cover.	1,5
<i>Antrozous pallidus</i> Pallid bat	CSC	Common species of low elevations in California. Occupies grasslands, desert, shrublands, woodlands, and forests from sea level up through mixed conifer forests. Is quite versatile in its choice of roosting sites and has been documented using tree hollows, rock crevices, caves, abandoned mines, and structures.	1-8
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	CSC	Found in all habitat types from low to moderate elevations. Not found in high elevation subalpine and alpine habitats. Requires caves, mines, or buildings for roosting. Prefers mesic habitats where it gleans from brush or trees along habitat edges.	2,3,4,7,8
<i>Euderma maculatum</i> Spotted bat	CSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. In montane habitats, forages over meadows, along forest edges, or in open coniferous woodland. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	1,2,5,7
<i>Lasiurus blossevillei</i> Western red bat	CSC	Typically found in trees, hedgerows, and forest edges. Roosts in foliage in summer.	1-8
<i>Eumops perotis</i> Western mastiff bat	CSC	Found in a variety of habitats, from desert scrub and chaparral to montane coniferous forest. Typically found in rocky cliff and canyon areas. Its presence is determined by the availability of significant rock features offering suitable roosting habitat.	1,2,5,7
<i>Lepus americanus tahoensis</i> Sierra Nevada snowshoe hare	CSC	Inhabits boreal riparian areas in the Sierra Nevada; favors thickets of deciduous trees in riparian areas and thickets of young conifers.	1,5
<i>Lepus townsendii townsendii</i> Western white-tailed jackrabbit	CSC	Inhabits a variety of habitats, including sagebrush, perennial grasslands, alpine dwarf-shrub, early successional conifer habitats, and wet meadows to timberline and above.	1,5

**TABLE 9-100: SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA (CONTINUED)**

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in Study Area Segment
<b>Mammals (cont.)</b>			
<i>Aplodontia rufa californica</i> Sierra Nevada mountain beaver	CSC	Inhabits dense growth of small deciduous trees and shrubs, wet soil, and abundance of forbs in the Sierra Nevada and east slope. Needs dense understory for food and cover. Burrows into soft soil. Needs abundant supply of water.	1,5
<i>Vulpes vulpes necator</i> Sierra Nevada red fox	CT	Preferred habitats are typical of the high Sierra Nevada: high elevation barren, conifer and shrub habitats, montane meadows, talus slopes, subalpine woodlands, and fell-fields. Found mostly above 7,000 feet and rarely below elevations of 5,000 feet.	1,5
<i>Gulo gulo</i> California wolverine	FC/CT	Habitats used in the southern Sierra Nevada include red fir, mixed conifer, lodgepole, subalpine conifer, alpine dwarf-shrub, barren, wet meadows, montane chaparral, and Jeffrey pine, from 6,400 feet to 10,800 feet in elevation. Uses caves, hollows in cliffs, logs, rock outcrops, and burrows for cover and denning.	1,5
<i>Martes pennanti pacifica</i> Pacific fisher	FC/CSC	Dens and bears young in the cavities of large trees or snags and strongly associated with mid-elevation mature and late successional coniferous or mixed forests. Generally found in stands with high canopy closure, large trees and snags, large woodlarge wood, large hardwoods, and multiple canopy layers.	1,2,5,7
<i>Taxidea taxus</i> American badger	CSC	Inhabits drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	7
<i>Ovis canadensis sierrae</i> Sierra Nevada bighorn sheep	FE/CE/CFP	Occurs primarily along the Sierra Crest in the northeast portion of the park. Most of the herd inhabits U.S. Forest Service land adjacent to the park.	5
STATUS: FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate FD = Federal Delisted CE = California Endangered CT = California Threatened CCE = California Candidate Endangered CFP = California Fully Protected Species CSC = California Species of Concern <sup>a</sup> Believed to be extirpated from the Merced River corridor within Yosemite National Park SOURCE: NPS 2011a			

### State of California Special Status Species

Of the 33 special status wildlife species known to occur or having the potential to occur in the study area, 32 are listed by the State of California as endangered, threatened, candidate, or a species of special concern. This includes 4 species of amphibians, 1 species of fish, 1 reptile species, 14 bird species, and 14 mammals, as shown in Table 9-100, which presents the 33 special status wildlife species known to occur or having the potential to occur within the Merced River Wild and Scenic River corridor. This table provides information regarding species designation, habitat requirements, and potential location within the study area. Data regarding the latter two elements are generally drawn

from the *Special Status Wildlife Species Report*. Locations of potential occurrence are estimated based on recorded observations and best professional judgment of NPS biologists.

## Species Accounts

### *Invertebrates*

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)

**Status.** Federally threatened

**General Distribution.** The valley elderberry longhorn beetle is found in areas below 915 meters (3,000 feet) in elevations that support species of elderberry (*Sambucus* sp.). At the time of listing in 1980, the beetle was known from fewer than 10 locations on the American River, Putah Creek, and Merced River. Current distribution ranges from southern Shasta County to Fresno County.

**Habitat Requirements.** The valley elderberry longhorn beetle is an invertebrate species that is completely dependent on its host plant, elderberry, throughout its one-year to two-year life cycle. The beetle spends most of its life in the larval stage, living in the stems of elderberry shrubs. Adults emerge from late March through June, when feeding and mating occurs, about the same time the elderberry flowers. The adult stage is short-lived; females lay their eggs on the bark, larvae hatch and burrow into the stems, and the cycle is repeated. Although elderberry shrubs are relatively common in riparian habitat, it appears that to serve as suitable habitat, shrubs must have stems that are 1 inch or greater in diameter at ground level (Barr 1991). Use of elderberry by the beetle is rarely apparent. Frequently, the only exterior evidence of the use by the beetle is a distinct exit hole created by the larva just before the pupal stage.

**Status in Merced River Corridor.** The El Portal Administrative Site is the only area in Yosemite National Park that lies below 915 meters (3,000 feet) in elevation. In El Portal, elderberry plants represent a subdominant species within live oak forests, interior live oak forests, interior live oak woodlands, blue oak woodlands, canyon live oak forests, mixed north slope forests, foothill pine/live oak/chaparral woodlands, northern mixed chaparral, interior live oak chaparral, and westside ponderosa pine forests. Elderberry shrubs are scattered throughout the El Portal Administrative Site, including approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle that occur in areas of potential development or management activities in El Portal.

### *Fish*

Hardhead (*Mylopharodon conocephalus*)

**Status.** California species of special concern

**General Distribution.** Hardhead are endemic to California and native to the Sacramento and San Joaquin River basins and the Russian River watershed. Hardhead are typically found in undisturbed areas of larger middle- and low-elevation streams and rivers. This species ranges from sea level to 1,450 meters (4,750 feet) in elevation. Historically, hardhead were regarded as a widespread and locally abundant species. Hardhead still appear to be widespread in foothill streams, but their

specialized habitat requirements combined with widespread alteration of downstream habitats has resulted in isolated populations making them more susceptible to local extinction (Moyle et al. 1995).

**Habitat Requirements.** Hardhead are typically found in undisturbed streams with clear, deep pools that have sand-gravel-boulder substrates and slow water velocities (Moyle et al. 1995). This species distribution might be limited to well-oxygenated streams because they are relatively intolerant of low oxygen levels, especially at higher temperatures (Cech et al. 1990). Most streams in which they occur have summer temperatures in excess of 20 °Celsius (C) (68 °Fahrenheit [F]); optimal temperatures for hardhead appear to 24–28 °C (75–82 °F).

**Status in the Merced River Corridor.** Hardhead observations have been recorded on two occasions in Yosemite, both from the Merced River. It is unlikely that hardheads occurred above El Portal on the Merced River. The Merced River gorge likely prevented them from migrating any farther up the river. The only documented observations of hardheads in the Merced River corridor were in 1987 and 2006 in El Portal (Stillwater Sciences 2008). Electrofishing surveys conducted by CDFG in 2008 at two sites in El Portal did not detect any hardhead.

### *Amphibians*

Mount Lyell Salamander (*Hydromantes platycephalus*)

**Status.** California species of special concern

**General Distribution.** The Mount Lyell salamander, endemic to the Sierra Nevada, ranges from the Sonora Pass (Sonora County) to Silliman Gap, Sequoia National Park (Tulare County). Isolated populations have also been documented in the Desolation Wilderness (El Dorado County) and on the Sierra Buttes (Sierra County). They inhabit high elevation (2,100 meters to 3,700 meters [6,890 feet to 12,139 feet]) snowmelt seep and waterfall habitat throughout the Sierra Nevada. There are also several populations of Mount Lyell salamander at lower elevations in the spray zones of waterfalls in Yosemite Valley (1,200 meters to 1,300 meters [3,937 feet to 4,265 feet]) and in riparian areas at lower elevation (1,400 meters to 2,000 [4,593 feet to 6,562 feet]) on the arid eastern slope of the Sierra Nevada, near the floor of the Owens Valley. The Owens Valley population was treated by CDFG as a separate species (Jennings and Hayes 1994), but recent genetics analysis does not support treating this as a separate species (Rovito 2009). Although the species has the broadest geographic range of any members of its genus *Hydromantes*, within that range, Mount Lyell salamanders may be very patchily distributed with small local populations that might be especially susceptible to local extirpation (Jennings and Hayes 1994). Consequently, they are a California species of special concern. According to Wake and Papenfuss in Lannoo 2005, there is no indication that either the size of the range or the density of this species has changed recently. In fact, new populations are continuing to be discovered. In Yosemite, the species has been observed at a number of sites in recent years.

**Habitat Requirements.** Juveniles and adults are commonly found in talus slopes of granite where water is flowing. They appear to favor habitats that are downslope of melting snowfields that persist long into or through the entire summer. Mount Lyell salamander may also be found near streams and

within the spray zones of waterfalls, under rocks and moss. They are nocturnal and take refuge under rocks during the daytime.

**Status in the Merced River Corridor.** Mount Lyell salamander observations have been recorded on 140 occasions in Yosemite National Park. Of these observations, 24 records are from the Merced River corridor. Between 1950 and 1954, there were 12 observations at a site along the John Muir Trail between Yosemite Valley and Little Yosemite Valley, and at two sites in Yosemite Valley. In 1969 and again in 1995, there were single observations in Yosemite Valley. One individual was observed along the John Muir Trail between Yosemite Valley and Little Yosemite Valley in 1995. From 2000–2006, there were four sightings along the John Muir Trail between Yosemite Valley and Little Yosemite Valley and five sightings in Yosemite Valley (CNDDDB 2012). In 2006, there were also two individuals observed in Yosemite Valley immediately outside of the river corridor buffer.

Yosemite Toad (*Anaxyrus canorus*)

**Status.** Federal candidate, California species of special concern

**General Distribution.** The historic range of Yosemite toads in the Sierra Nevada occurs from the Blue Lakes region north of Ebbetts Pass (Alpine County) to 5 kilometers (3.1 miles) south of Kaiser Pass in the Evolution Lake/Darwin Canyon area (Fresno County) (Jennings and Hayes 1994). Historically, the toad ranged from 1,460 meters to 3,630 meters (4,790 feet to 11,910 feet) in elevation (Stebbins 1985) throughout its range and from 1,950 meters to 3,444 meters (6,400 feet to 11,300 feet) in elevation in Yosemite (Karlstrom 1962). The toad is currently known from 179 sites in Yosemite between the elevations of 2,134 meters to 3,505 meters (7,000 feet to 11,500 feet) (Knapp 2003). Estimates suggest that the toad has disappeared from between 47% and 79% of the sites that it previously occupied (Jennings and Hayes 1994, Drost and Fellers 1996). Remaining populations appear more scattered across the landscape and consist of a small number of breeding adults (Kagarise Sherman and Morton 1993).

The NPS surveyed 446 meadows for Yosemite toads during the summer of 2010, 166 of which had been surveyed at least once between 1992 and 2009. The remaining 280 meadows had never been surveyed. The surveys documented 44 new breeding populations of toads, and increased the number of documented breeding populations from 135 to 179. Toads were not found in approximately 50% of the sites where toads had been previously documented, while 9% of meadows where toads had not been documented previously had breeding during the 2010 survey.

**Habitat Requirements.** The Yosemite toad has been recorded in a broad range of high montane, subalpine, and alpine habitats, including wet meadows, lakes, ponds, and shallow spring channels. The Yosemite toad is most commonly found, however, in shallow, warm water areas, including standing and flowing water in wet meadows, small permanent and ephemeral ponds, and flooded shallow grassy areas and meadows adjacent to lakes (Karlstrom 1962). Wet meadow habitat is the focal habitat for this species.

**Status in the Merced River Corridor.** Yosemite toad observations have been recorded on 2,142 occasions in Yosemite. Of these observations, 11 records are from the Merced River corridor. There are no records of Yosemite toads within the Merced River corridor prior to 1999, which is likely due



to a lack of survey efforts targeting the toad. Between 1999 and 2010, there were a multiple sightings at higher elevation sites around Triple Divide, Isberg, and Rodgers peaks.

Foothill Yellow-Legged Frog (*Rana boylei*)

**Status.** California species of special concern

**General Distribution.** Historically, foothill yellow-legged frogs occurred from the Santiam River (Marion County), Oregon, in the north to the San Gabriel Mountains (Los Angeles County), California (Hayes and Jennings 1988) in the south. They occupied the western slopes of the Cascade Mountains, the western foothills of the Sierra Nevada and Coast Ranges, and the Tehachapi and San Gabriel Mountains. An isolated population also occurred in the Sierra San Pedro Martir, Baja California, Mexico (Loomis 1965). Today, foothill yellow-legged frogs continue to occur across their historical range in Oregon and California but in greatly reduced numbers (Lannoo 2005). In California, they inhabit elevations from sea level to 1,939 meters (6,360 feet) (Hemphill 1952). The species is believed to have disappeared from 51% of its historic localities throughout its range and is estimated to have disappeared from approximately two-thirds of its historic localities within the Sierra Nevada (Jennings 1996).

**Habitat Requirements.** Foothill yellow-legged frogs are primarily found in streams with riffles, rocky substrates, and open banks (Lannoo 2005). Adults have also been found in deep, isolated pools and vegetated backwaters (Hayes and Jennings 1988). Breeding and rearing habitat is located in gently flowing water where there is a reduced risk to egg masses and tadpoles from high water events and scouring (Kupferberg 1996a).

**Status in the Merced River Corridor.** There are only four recorded observations of foothill yellow-legged frogs in Yosemite. All four of those sightings were in Yosemite Valley and near Cascade Creek. The first specimen was collected near Cascade Creek in July 1948 (University of Michigan Museum of Zoology). Three additional observations were reported for Yosemite Valley in 1974 (Yosemite Wildlife Observation Database 2011). No individuals have been reported in the park since the mid-1970s, and the species is believed to be extirpated from the park. The low number of historic records is likely a reflection of the limited habitat for foothill yellow-legged frogs in the park.

Sierra Nevada Yellow-Legged Frog (*Rana sierrae*)

**Status.** Federal candidate, California candidate

**General Distribution.** Sierra Nevada yellow-legged frogs currently range from north of the Feather River in northern Plumas County, California, south, including all of Yosemite, to the divide between the South and Middle Forks of the Kings Rivers in Kings Canyon National Park. The majority of their range is in federally designated wilderness. Despite the fact that most of their habitat is fully protected, the Sierra Nevada yellow-legged frog has disappeared from >93% of their historic range. The declines have escalated since the late 1970s, and most of the remaining populations are much smaller than those that would have occurred historically (Knapp 2005). Consequently, the Sierra Nevada yellow-legged frog has gone from being one of the most abundant species in the Sierra Nevada (Grinnell and Storer 1924) to one that is considered critically endangered. This species is currently known to occur at

approximately 166 sites in Yosemite at elevations ranging from 1,676 meters to 3,536 meters (5,500 feet to 11,600 feet). The Sierra Nevada yellow-legged frog is a candidate species for listing under the federal ESA, and the USFWS plans to initiate a proposed rule to list this species in 2013. A listing decision would occur within 12 months of proposed ruling.

**Habitat Requirements.** The Sierra Nevada yellow-legged frog occupies aquatic habitats for almost all of their seasonal life history; they breed, tadpoles develop, and they overwinter in lakes and ponds or low-flowing streams and use flowing water to move between sites. This species is rarely found more than a few feet from water. Because it overwinters in water and has a multi-year tadpole phase, it requires waters that are deep enough that they don't freeze solid in the winter and they don't dry out during the summer.

**Status in the Merced River Corridor.** Sierra Nevada yellow-legged frog observations have been recorded on 4,581 occasions in Yosemite. Of these observations, 20 records are from the Merced River corridor. Most of the sites where Sierra Nevada yellow-legged frogs are known to exist fall outside of the Merced River corridor. Concerted efforts to survey amphibians in the park have been conducted between 1992 and 2010. Before 1992, there were five records of Sierra Nevada yellow-legged frogs within the river corridor at Wawona (1922), Yosemite Valley (1922, 1958), Triple Peak (1940), and Horsethief Canyon (1991). One of the historic records from Yosemite Valley may have been from farther up Tamarack Creek rather than from the Valley. During a comprehensive survey of all mapped and unmapped lakes and ponds in Yosemite conducted in 2000–2002, Knapp (2005) observed Sierra Nevada yellow-legged frogs at 13 sites around Red and Rodgers peaks. A total of 30 adults or subadults and about 1400 tadpoles were recorded at these sites. Between 1992 and 2010, there were two additional observations in the upper reaches of the Merced River.

## ***Reptiles***

Western Pond Turtle (*Emys marmorata*)

**Status.** California Species of Special Concern

**General Distribution.** The historic range of western pond turtles included the Pacific slope from Puget Sound to Sierra San Pedro Martir in Baja California Norte and isolated inland populations in Washington, Oregon, California, Nevada, and Idaho. Some of these isolated populations may represent introductions (Holland 1994). Western pond turtles have an elevation range from sea level to about 2,042 meters (6,700 feet) but are uncommon anywhere above about 1,524 meters (5,000 feet) (Holland 1994). The species is believed to be declining throughout 75%–80% of its range primarily due to habitat loss, nonnative predators (bullfrogs, large-mouth bass, and possums), and overharvesting for food. According to Jennings and Hayes (1994), the western pond turtle still occurs in 90% of its historic range in the Central Valley and west of the Sierra Nevada, but in greatly reduced numbers.

**Habitat Requirements.** Western pond turtles inhabit a wide range of permanent and ephemeral aquatic habitats, including ponds, marshes, rivers, streams, and ditches (Stebbins 1985, Behler 2002). In rivers and streams, they usually occupy slow-moving, deep pools with rocky or muddy bottoms and abundant vegetation (Stebbins 1985, Behler 2002). There is also a high correlation between turtle

abundance and availability of logs, boulders, vegetation mats, and mud banks to use as basking sites (Bury and Germano 2008). Emergent basking sites such as logs are preferred because they offer some protection from terrestrial predators and offer quick escapes into deep water. This species may also spend a substantial amount of time in upland terrestrial habitats. Terrestrial habitat includes basking sites and nesting habitat. Western pond turtles deposit their eggs on land, usually above the floodplain, up to several hundred feet from water. For nesting, gravid (with eggs) females tend to seek out open areas with sparse, low vegetation (annual grasses and herbs), low slope angle, and dry hard soil.

**Status in the Merced River Corridor.** Western pond turtle observations have been recorded on 16 occasions in Yosemite. Of these observations, there have only been two sightings of western pond turtles in the Merced River corridor; both sightings were in Yosemite Valley in the 1950s. In 1950, there was a sighting in Sentinel Meadow and, in 1958, another turtle was observed in Stoneman Meadow (CNDDB 2012). There have been no sightings since the 1950s in the Merced River corridor, and the species is believed to be extirpated from the Merced River within Yosemite.

### ***Birds***

Harlequin Duck (*Histrionicus histrionicus*)

**Status.** California species of concern

**General Distribution.** Harlequin ducks are found on both the western and eastern seaboard of North America. In western North America, their breeding range extends from western Alaska and the northern Yukon south to the Sierra Nevada. From April to September, they migrate inland to breed along turbulent mountain rivers with vegetated banks for cover (Beedy 2008). At the conclusion of the breeding season, they move back to the coast where they forage in intertidal areas. Harlequin duck population decline has been noted across much of their range (Robertson and Goudie 1999). Harlequin duck is a rare breeder in Yosemite.

**Habitat Requirements.** Yosemite features the clear, fast-flowing river and stream conditions associated with the breeding grounds of harlequin ducks. These conditions include low acidity, steep banks, and substantial streamside vegetation (Beedy 2008). They feed primarily by diving into the water and searching among rocks for aquatic insects, although they will occasionally take fish (Robertson and Goudie 1999).

**Status in Merced River Corridor.** As of 2011, there are 43 records of harlequin ducks in Yosemite's Wildlife Observation Database. Of these records, 39 observations are from the Merced River corridor. According to Gaines (1992), harlequin ducks were found in every major Yosemite watershed from 1,200 meters in elevation to timberline until the 1920s. After an absence of nearly 20 years, a female harlequin was observed in Wawona in 1940 (Gaines 1992). It wasn't until 1977 that harlequins were again observed in the Merced River, and they were seen with some regularity until 1985. After a 15-year absence, harlequin ducks were documented repeatedly in the Merced River between 2000–2007 (Yosemite Wildlife Observation Database 2011).

Northern Goshawk (*Accipiter gentilis*)

**Status.** California species of special concern

**General Distribution.** Northern goshawks occupy temperate and boreal forests throughout the Holarctic (Brown and Amadon 1968, Squires and Reynolds 1997). They are year-round residents throughout all or most of the California range, although in winter some individuals remain on or near breeding territories while others migrate short distances to winter elsewhere (Keane 1999).

Throughout their range, they inhabit moderately dense coniferous forests broken by meadows and other openings, at elevations between 1,500 meters and 2,700 meters (4,920 feet and 8,860 feet).

Northern goshawk is an uncommon year-round resident in Yosemite.

**Habitat Requirements.** Northern goshawks forage in mature and old-growth forests that have relatively dense canopies and open understories (Beier and Drennan 1997) but also hunt among a variety of vegetative cover, including meadow edges (Younk and Bechard 1994). Goshawks hunt from tree perches, scanning the ground and lower canopy for prey. As such, an open understory improves the chances of detection and capture of prey (Reynolds et al. 1992).

**Status in Merced River Corridor.** Northern goshawk observations have been recorded on 160 occasions in Yosemite. Of these records, 54 observations were in the Merced River corridor, mostly in Yosemite Valley. Besides in the Valley, one bird was seen in flight near Wawona Dome (1982), three were recorded from Little Yosemite Valley (1990, 1994), and two were recorded from Merced Lake (1982, 1990) (Yosemite Wildlife Observation Database 2011). Gaines (1992) indicates Little Yosemite Valley as a “representative nesting locality.”

Golden Eagle (*Aquila chrysaetos*)

**Status.** California fully protected

**General Distribution.** Golden eagles occur across most of North America, ranging from high alpine habitats to low deserts. Nearly all nesting in the United States occurs west of the Great Plains, with the rest of the range used primarily by migrants (Palmer 1988). In California, they inhabit foothills, mountainous areas, sage-juniper flats, and desert habitats (Zeiner et al. 1990). In the Sierra Nevada, golden eagles favor grasslands and areas of shrubs or saplings, and open-canopied woodlands of young blue oaks. In late summer, they often range to above timberline (Zeiner et al. 1990). The golden eagle is a locally uncommon breeder at Yosemite.

**Habitat Requirements.** Golden eagles feed mostly on rabbits and rodents but may also take other mammals, birds, reptiles, and carrion. They hunt in meadows, clearings, rock outcroppings, granite shelves, fell-fields, talus, and other open or openly wooded habitats, but they avoid dense forests (Gaines 1992). They employ three main strategies to search for prey: soaring, still-hunting from a perch, and low contouring flight (Edwards 1969, Dunstan et al. 1978, Dekker 1985, Palmer 1988).

**Status in Merced River Corridor.** Golden eagle observations have been recorded on 273 occasions in Yosemite. Of these observations, there are 74 records from the Merced River corridor. These records span the years from 1915–2008. The majority of these observations are from locations in Yosemite

Valley. Golden eagles have also been observed near Wawona Dome (1983) and at Washburn Lake (1940), as well as in the Merced Gorge between the Valley and El Portal (Yosemite Wildlife Observation Database 2011). Nevada Fall is a representative nesting location (Gaines 1992).

Northern Harrier (*Circus cyaneus*)

**Status.** California species of special concern

**General Distribution.** The northern harrier is found as a breeding species throughout North America and Eurasia (where it is called the hen harrier). It is a long-distance migrant, and its range extends from northern South America to breeding grounds north of the Arctic Circle (Macwhirter and Bildstein 1996). Throughout its range, the northern harrier favors open areas such as grasslands, meadows, wetlands, and agricultural clearings. Northern harrier is a rarely seen migrant that passes through Yosemite.

**Habitat Requirements.** Northern harriers nest on the ground and in winter will roost communally on the ground. Their densest populations on the breeding grounds are typically associated with large tracts of undisturbed habitats dominated by thick vegetation growth (Apfelbaum and Seelbach 1983, Toland 1986, Kantrud and Higgins 1992). Northern harriers winter in a variety of open habitats dominated by herbaceous cover, including upland grasslands, open-habitat floodplains, and freshwater marshes (Temeles 1986, Collopy and Bildstein 1987). They typically hunt by flying low over habitats while searching for mammals and small birds (Macwhirter and Bildstein 1996).

**Status in Merced River Corridor.** Northern harriers observations have been recorded on 47 occasions in Yosemite. Of these observations, 19 records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). The majority of the records are from meadows in Yosemite Valley during the fall. Three records are from Wawona; two of those observations were in the same location on the same day (Wawona Meadow, August 1, 1977), and one was from 2006. The earliest documentations of northern harriers in the Valley are two records from 1926 and 1928 (Gaines 1992). Following these records is an observation of two birds from 1954. Beginning in 1977, there are records of several northern harriers per decade in the Valley through 2006 (Yosemite Wildlife Observation Database 2011).

Bald Eagle (*Haliaeetus leucocephalus*)

**Status.** California State endangered, California fully protected

**General Distribution.** Bald eagles are found throughout North America, and there are breeding populations in almost all U.S. states and Canadian provinces. Once far more numerous than they are today, bald eagle populations suffered tremendously during the 20th century due to state-enacted bounties (Robards and King 1966) and poisoning from pesticides like DDT (Buehler 2000). Stricter protection measures and a reduced exposure to environmental toxins has led to the large-scale recovery of bald eagles, a feat widely regarded as one of the most successful modern conservation efforts. Bald eagles are uncommon but occasional breeders in Yosemite.

**Habitat Requirements.** Bald eagles favor lakes and rivers with abundant prey (mostly fish) and large trees in which to nest. The relative paucity of bald eagle observations in Yosemite indicates that there may be insufficient fish in Yosemite rivers to support a robust eagle population. Bald eagles also compete directly with ospreys, occasionally stealing food from them. Bald eagles are regularly observed in Sierra foothill reservoirs and at lakes east of Tioga Pass; in both locations the eagles are feeding on stocked fish populations that are higher in elevation than what would naturally be present.

**Status in Merced River Corridor.** Bald eagle observations have been recorded on 123 occasions in Yosemite. Of those observations, 25 records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). Roughly half of the bald eagle observations in the river corridor are from areas downstream of Yosemite Valley. The first records of bald eagles in Yosemite are from Wawona (November 1957). From the late 1970s to 1992, bald eagles were documented in the river corridor at a rate of one every few years.

Peregrine Falcon (*Falco peregrinus*)

**Status.** California fully protected

**General Distribution.** Peregrine falcons can be found on nearly every ice-free landmass on earth. They will frequently migrate enormous distances; individuals from northern populations might travel 25,000 kilometers (15,530 miles) annually (White et al. 2002). In California, they breed along the coast as well as in most northern mountain ranges, including the Sierra Nevada (Polite and Pratt 1990). Peregrine falcon nests are often scrapes on ledges or cliffs, a habit they practice in the Valley on features like El Capitan and Glacier Point. The use of dichlorodiphenyltrichloroethane (DDT) as a pesticide in the mid-to-late 1900s decimated peregrine falcon populations, and as recently as 1981 there may have been as few as 39 breeding pairs in California (Monk 1981). Intensive management of peregrines falcons, including captive rearing, led to a resurgence of their populations in the last three decades. The peregrine falcon is a rare but regular breeder in Yosemite.

**Habitat Requirements.** Peregrine falcons will hunt in a wide variety of habitats, including meadows, woodlands, marshes, and mudflats, but typically nest on cliff ledges with expansive views (Gaines 1992). Peregrine falcons feed almost exclusively on birds, which are taken in flight. They require cliffs and ledges for cover and usually breed and hunt near water (Polite and Pratt 1990).

**Status in Merced River Corridor.** Peregrine falcon observations have been recorded on 118 occasions in Yosemite. Of those observations, 65 records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). The first documented peregrine sighting in Yosemite Valley was in 1940. Following this record are three observations from the summer of 1949, one of which involved two peregrines. In the 1950s and 1960s, DDT sent peregrine falcon populations plummeting all over the world. In 1972, the use of DDT was essentially banned; and in 1973, the peregrine was one of the first species to be listed under the federal ESA. By the early 1970s, peregrine falcons had all but disappeared in Yosemite. In 1978, rock climbers scaling the face of El Capitan in Yosemite Valley discovered nesting peregrine falcons; the first time in over 35 years that this species had been confirmed as breeding in the park. Since 1978, over 30 years ago, peregrine falcons have continued to recover in the park. Breeding surveys conducted in 2010 revealed eight active nests in

Yosemite, the most ever documented in one season. Yosemite has a policy of temporarily closing rock climbing routes between March and August that pass through active peregrine falcon nesting sites.

Long-Eared Owl (*Asio otus*)

**Status.** California species of special concern

**General Distribution.** The long-eared owl inhabits open and sparsely forested habitats across North America and Eurasia between 30° and 65°North latitude (Marks et al. 1994). Long-eared owls are found across most of the United States but are uncommon throughout their range. In the Sierra Nevada, this species is found from blue oak savannah up to ponderosa pine and black oak habitats, usually in association with riparian habitats. In Yosemite, they are known to nest in riparian forests and oak-conifer woodlands (Gaines 1992). Long-eared owls will also use live oak thickets and other dense stands of trees for roosting and nesting (Zeiner et al. 1990). Long-eared owl is a rare summer resident and breeder at Yosemite.

**Habitat Requirements.** Long-eared owls nest in riparian, oak-conifer, and eastside pine and juniper forests in the Sierra Nevada, and are associated with edges between forests and grasslands or shrublands (Gaines 1992, Marks et al. 1994, Hunting 2008). These owls might be more numerous than is known; little is known of their population status, habitat requirements, and prey in the park (Gaines 1992).

**Status in Merced River Corridor.** In Yosemite, little is known about the status of the long-eared owl. During one year of meadow surveys for great gray owls, long-eared owls were detected at 5 out of 15 meadows (Keane et al. 2011); none of these meadows were within the Merced River corridor. The species has been recorded on 22 different occasions in Yosemite, of which only three records are from Yosemite Valley (Yosemite Wildlife Observation Database 2011). Long-eared owls are only known to have nested in the Valley on one occasion, and that bird was shot and collected by the Grinnell/MVZ survey in 1915. Two records are from the same date and general location (Yosemite School and Leidig Meadow, October 1, 1987).

Great Gray Owl (*Strix nebulosa*)

**Status.** California Endangered

**General Distribution.** The great gray owl is a large forest owl that ranges across northern boreal and temperate forests in both North America and Eurasia. Throughout its circumpolar range, the species is considered rare. In California, great gray owls are restricted to the Sierra Nevada and southern Cascades. The core breeding distribution is centered on Yosemite and the immediately adjacent and surrounding Stanislaus, Sierra, and Sequoia National Forests (Winter 1986, Rich 2000, Keane et al. 2011). The Sierra Nevada population is the southernmost population in the world, with the closest known breeding population occurring in southern Oregon. An estimated 100 to 200 pairs of great gray owls occur in California, with a limited geographic distribution centered in Yosemite and adjacent National Forest lands in the central Sierra Nevada (Keane et al. 2011). Recent genetic work by Hull et al. (2010a) has revealed that the Yosemite population of great gray owls has been demographically isolated from other *S. nebulosa* populations for an extensive period of time, and the authors recommend designating a separate



subspecies *S. n. yosemitensis* for the Sierra Nevada lineage. Genetic diversity also was extremely low for this subspecies, which is typical of recent population bottlenecks and likely attributable to habitat loss and fragmentation (Hull et al. 2010a). Given that *S. n. yosemitensis* is essentially restricted to Yosemite and immediate environs, this park is unequivocally imperative for the conservation of this subspecies (Hull et al. 2010a). The great gray owl is a rare year-round resident and regular breeder in Yosemite.

**Habitat Requirements.** In the Sierra Nevada, the owls require extensive, densely vegetated wet or moist meadows margined by old-growth coniferous forest from the mixed conifer through the red fir to the lower lodgepole pine zones (Siegel and DeSante 1999) between 750 meters to 2,700 meters elevation (Greene 1995). Great gray owls breed in conifer stands with large snags and high canopy closure in the immediate vicinity of a montane meadow. The vast majority of known nesting sites have been within 250 meters of a meadow, with most averaging 150 meters from the meadow's edge (Maurer 2006, Siegel 2006). In the greater Yosemite area, great gray owls tend to nest in large, broken-topped conifer snags, particularly red fir (*Abies magnifica*) or white fir (*Abies concolor*), and in lower elevations have also been found in black oak (*Quercus kellogi*) (Greene 1995, Keane et al. 2011).

**Status in Merced River Corridor.** Great gray owl observations have been recorded on 204 occasions in Yosemite. Of these observations, 21 records are from the Merced River corridor. The majority of these observations were in or around Wawona Meadow, with just five observations in Yosemite Valley (Yosemite Wildlife Observation Database 2011).

California Spotted Owl (*Strix occidentalis occidentalis*)

**Status.** California species of concern

**General Distribution.** The California spotted owl ranges from the southern Cascades south throughout the entire Sierra Nevada and in the central Coast Ranges. Population density in Yosemite is higher than elsewhere in the Sierra Nevada. In Yosemite, owl density was estimated from 0.25 to 0.46 owls per square kilometer (km<sup>2</sup>) (1,000 square miles [m<sup>2</sup>]), whereas the mean density in surrounding areas in the Sierra Nevada was estimated from 0.10 to 0.21 km<sup>2</sup> (1,000 m<sup>2</sup>) (Roberts 2008). Although Roberts (2008) did not calculate home ranges, California spotted owl pairs in Yosemite [1 pair per 5.6 km<sup>2</sup> (3.48 m<sup>2</sup>)] exceeded the mean home range estimate throughout California [10.5 km<sup>2</sup> (6.52 m<sup>2</sup>)] (Zabel et al. 1992). Roberts (2008) estimated 315 spotted owl pairs in Yosemite, with 154 pairs in burned mixed-conifer forest and 161 pairs in unburned forest. Spotted owl is an uncommon year-round resident and regular breeder in Yosemite.

**Habitat Requirements.** The California spotted owl is strongly associated with areas of mature and old forest with thick canopy that contains many dense, old, live, and dead trees and fallen logs (Blakesley et al. 2005, Seamans 2005). Spotted owls prey mainly on small to medium-sized mammals, primarily rodents in the Sierra Nevada. It mostly consumes northern flying squirrels (*Glaucomys sabrinus*) in the higher elevations (conifer forests) and woodrats (*Neotoma* spp.) at lower elevations (burned mixed-conifer, oak woodlands, and riparian forests) and throughout southern California (Verner et al. 1992a, Roberts 2008). Downed woody debris in higher-elevation forests of the Sierra Nevada is strongly associated with underground fungi, which are important food for spotted owl prey species, such as northern flying squirrels (Davis and Gould 2008).

**Status in Merced River Corridor.** The Sierra Nevada offers the only extensive, nearly continuous habitat for the California spotted owl and is of critical importance for protecting this subspecies (Siegel and DeSante 1999). California spotted owl observations have been recorded on 72 occasions in Yosemite. Of these observations, 14 records are from the Merced River corridor. The first documented observation of a California spotted owl in Yosemite Valley was in 1940. Sightings of California spotted owls are sporadic in the Valley. Yosemite's wildlife observation database only contains one reference to a California spotted owl in Wawona in 1972 and one high-elevation observation at Merced Lake in 2004 (Yosemite Wildlife Observation Database 2011).

Vaux's Swift (*Chaetura vauxi*)

**Status.** California species of special concern

**General Distribution.** Vaux's swifts breed from southwestern Canada through the western United States to Mexico, Central America, and northern Venezuela. In winter, northern migrant populations of this species overlap southern residents (Bull and Collins 2007). Vaux's swifts are an uncommon breeder in Yosemite.

**Habitat Requirements.** Vaux's swifts require older trees and hollow snags for nesting and roosting habitat. To maintain nest and roost trees over time, both live and dead large-diameter hollow trees should be maintained, as well as green trees with some indication of decay to replace those that fall or become unsuitable (Bull and Collins 2007).

**Status in Merced River Corridor.** Vaux's swift observations have been recorded on 24 different occasions in Yosemite. Of these observations, five records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). They are a rare summer resident in the Merced River corridor, although Gaines (1992) suspects that Wawona Meadow is a regular nesting site for them. Furthermore, Gaines (1992) suspects that Vaux's swifts are "thinly but widely distributed" through old-growth forests with suitable nesting sites, and that the many documentations of them near meadows may not reflect the true nature of their habitat preferences.

Black Swift (*Cypseloides niger*)

**Status.** California species of special concern

**General Distribution.** Black swifts are found throughout the western United States and Canada, and as far south as Costa Rica. Despite their large range, black swift populations are poorly understood and probably small; fewer than 100 of their breeding sites have been documented (Lowther and Collins 2002). In California, their populations are focused in the central coast, the central and southern Sierra Nevada, and in the San Bernardino and San Jacinto mountains (Roberson and Collins 2008).

**Habitat Requirements.** In Yosemite, black swifts only nest near or behind waterfalls, although elsewhere in their range nests are found on sea cliffs or other sheer rock faces (Lowther and Collins 2002). Their primary food source during the breeding season are events of emergent winged ants, which in southern California accounts for as much as 90% of what adults feed a fledgling (Foerster 1987, Marin 1999, Rudalevige et al. 2003).

**Status in Merced River Corridor.** Black swifts have been observed on 32 occasions in Yosemite National Park. Of these observations, 21 records are from the Merced River corridor. Despite suitable habitat elsewhere in Yosemite, the vast majority of black swift observations in the park are in or near the main stem of the Merced River (Yosemite Wildlife Observation Database 2011). There is only one documented observation of a black swift in the Tuolumne River drainage (Hetch Hetchy Reservoir, 2001). In the 1920s, local naturalists located black swift nests near Yosemite Valley (Gaines 1992), and Grinnell and Miller (1944) indicate the Valley and other locations in Mariposa County as nesting sites. Bridalveil Fall is suspected to be one of only three sites in California where nesting populations of black swifts exceed 10 pairs (Roberson and Collins 2008). Gaines also indicates Nevada Fall as a nesting site.

Olive-Sided Flycatcher (*Contopus cooperi*)

**Status.** California species of special concern

**General Distribution.** The olive-sided flycatcher breeding range extends from Alaska across Canada south into the United States, where it occupies forested areas. In California, the general outline of its current breeding range is largely unchanged from historic range. However, local extirpations have been reported for a few areas (Marshall 1988, Raphael et al. 1988). The olive-sided flycatcher is well sampled by Breeding Bird Surveys, which show that while the species is still abundant in the state, populations declined steadily from 1968 to 2004 (Sauer et al. 2005). Likewise, migration data from Southeast Farallon Island also show significant declines over a 25-year period (1968–1992) (Pyle et al. 1994). Olive-sided flycatchers are a fairly common summer resident in Yosemite.

**Habitat Requirements.** Olive-sided flycatchers forage in unobstructed canopies with high perches (Altman and Sallabanks 2000). Grinnell and Miller (1944) described their foraging and singing-post perches as apical tips of snags that protrude above the surrounding canopy. Altman (1999) observed that most foraging took place from the upper third of trees or snags.

**Status in Merced River Corridor.** Olive-sided flycatcher observations have been recorded on 81 occasions in Yosemite. Of these observations, 15 records are from the Merced River corridor. The first recorded observations of olive-sided flycatchers in Yosemite Valley were in the 1920s. Between 1923 and 1939, there were nine observations of this species in the Valley. Four records are from the 1970s, with one of these being the sole Wawona observation. An observation at Washburn Lake from 1990 is the highest-elevation observation from the Merced River corridor (Yosemite Wildlife Observation Database 2011).

Willow Flycatcher (*Empidonax traillii*)

**Status.** California endangered

**General Distribution.** The willow flycatcher is a neotropical migrant that breeds in riparian and moist meadow willow thickets in the United States and southern Canada (American Ornithologists' Union 1983). The willow flycatcher winters from Mexico to northern South America. Currently, about half of the willow flycatcher breeding population in California occurs in the Sierra Nevada (Zeiner et al. 1990, Kus et al. 2000). Most willow flycatchers in the Sierra Nevada are found at elevations from 366 meters to 2,900 meters (1,200 feet to 9,500 feet), although most of the known willow flycatcher sites (88%)

occur at elevations between 1,200 meters and 2,400 meters (3,900 feet to 7,900 feet) (Serena 1982, Harris et al. 1988, Stafford and Valentine 1985). Willow flycatchers are a rare former breeder in Yosemite.

**Habitat Requirements.** As their name suggests, willow flycatchers frequent the willows found along languid streams and, to a lesser degree, within moist meadows (Gaines 1992). Deciduous trees and shrubs interspersed with open areas enhance the quality of foraging habitat. Willow flycatchers forage by either gleaning insects from vegetation while flying, or by waiting on an exposed perch and capturing insects in flight (Ettinger and King 1980, Sanders and Flett 1989).

**Status in Merced River Corridor.** Once a commonly observed bird in Yosemite Valley, willow flycatchers are now exceedingly rare in the park as a whole. Willow flycatcher observations have been recorded on 50 occasions in Yosemite. Of these observations, 26 records are from the Merced River corridor. The first documented observation of a willow flycatcher in Yosemite was made by the Grinnell survey in 1915. Almost all of the river corridor's willow flycatcher observations fall between 1915 and 1931 (Yosemite Wildlife Observation Database 2011). Gaines (1992) indicates that they had stopped breeding in the Valley by 1966. Two observations from the 1970s (Yosemite Valley 1974, Wawona 1977) are the most recent sightings of willow flycatchers in the river corridor, although they are still seen on rare occasions elsewhere in the park. A recent study found that willow flycatchers no longer breed in Yosemite National Park (Siegel et al. 2008)

Yellow Warbler (*Setophaga petechia*)

**Status.** California species of special concern

**General Distribution.** Breeding range of the yellow warbler extends over most of North America, and wintering range extends to northern South America. In California, yellow warblers breed over much of the state where suitable breeding habitat occurs. Some yellow warblers winter in extreme southern California. Yellow warbler is a locally common summer resident and regular breeder in Yosemite.

**Habitat Requirements.** Yellow warblers breed primarily in riparian woodlands from coastal, valley, and desert lowlands, up to 2,400 meters in elevation in the Sierra Nevada. Other breeding habitat types includes montane chaparral, ponderosa pine, and mixed conifer where substantial amounts of brush occur (Zeiner et al. 1990). In the Merced River corridor, they generally inhabit areas of willow and cottonwood.

**Status in Merced River Corridor.** Yellow warbler observations have been recorded on 53 occasions in Yosemite (Yosemite Wildlife Observation Database 2011). Of these observations, 24 records are from the Merced River corridor. The first documented observation of yellow warblers in Yosemite Valley was in 1926 (Gaines 1992). Gaines (1992) characterized the Valley and Little Yosemite Valley as representative nesting localities. In 2010, bird surveys detected 49 individual yellow warblers in Yosemite Valley and confirmed breeding based on two specific observations: (1) an adult carrying food for young and (2) recently fledged young.

## **Mammals**

Mount Lyell Shrew (*Sorex lyelli*)

**Status.** California species of special concern

**General Distribution.** The known range of this species spans a small area of the east-central Sierra Nevada, California, including areas in and around Yosemite in Tuolumne, Mariposa, and Mono counties, at elevations of 2,100 meters–3,150 meters (6,900 feet–10,350 feet) (Grinnell 1933, Williams 1984). This shrew might possibly occur in similar habitat from Mono County to Modoc County, but the area outside its known range has not been adequately surveyed. Recent surveys by the Grinnell Resurvey Project in 2007 documented this species at the two original localities where it was recorded in the Grinnell era (upper Lyell Basin and Vogelsang Lake) (Moritz 2007). The Mount Lyell shrew was also found to have expanded its known range to the north, and to lower elevations, at Glen Aulin (2,408 meters [7,900 feet]), Kerrick Meadow (2,926 meters [9,600 feet]) and upper Return Creek in Virginia Canyon (3,018 meters [9,900 feet]). This species was found to be uncommon at each locality (Moritz 2007).

**Habitat Requirements.** Mount Lyell shrew specimens have been found primarily in wetland communities, near streams, in grassy areas, under willows, and in sagebrush steppe communities (Grinnell 1933, Williams 1984, Museum of Vertebrate Zoology Database 2011). This shrew requires moist soil (Ingles 1965) and uses logs, stumps, and other surface objects for cover (Grinnell and Storer 1924). This species eats insects and other invertebrates found while foraging on the ground, in stumps, and in logs (Grinnell and Storer 1924, Ingles 1965).

**Status in Merced River Corridor.** Surveys for the Mount Lyell shrew in and near Yosemite in 2003–2007 yielded specimens from several locations, one of which was within the Merced River corridor at Cathedral Pass in July 2007 (Museum of Vertebrate Zoology Database 2011). In addition, one male specimen was collected in July 1915 1.5 kilometer from the river corridor at the head of Lyell Canyon (Museum of Vertebrate Zoology Database 2011).

Pallid Bat (*Antrozous pallidus*)

**Status.** California species of special concern

**General Distribution.** The pallid bat is found from southern British Columbia and Montana to central Mexico and Cuba, and east to Texas, Oklahoma, and Kansas. Throughout California, the species inhabits primarily low to mid elevations, although it has been found up to 3,400 meters (11,000 feet) in the Sierra Nevada (Barbour and Davis 1969). Habitats range from desert to coniferous forest and nonconiferous woodlands. The pallid bat occurs in Yosemite, but its status is not well known. There are eight museum specimens for pallid bats for Yosemite, all from Yosemite Valley (Museum of Vertebrate Zoology Database 2011) collected between 1934 and 1940 (Pierson et al. 2006).

**Habitat Requirements.** This species is quite versatile in its choice of roosting sites and has been documented using tree hollows (both oak and ponderosa pine), rock crevices, caves, abandoned

mines, and other anthropogenic structures such as buildings and bridges (Barbour and Davis 1969, Hermanson and O'Shea 1983, Lewis 1996, Orr 1954, Pierson et al. 1996, Pierson et al. 2001). This species is gregarious and roosts in nursery colonies of typically between 30 and several hundred individuals. The pallid bat feeds primarily on large, flightless arthropods such as scorpions, Jerusalem crickets, cicadas, wolf spiders, and centipedes (Pierson et al. 2006). Large cerambycid beetles, particularly *Prionus californicus*, and ten-lined June beetles (*Polyphylla decemlineata*) are also major prey items (Orr 1954, Pierson et al. 2004).

**Status in Merced River Corridor.** The pallid bat has been detected within the Merced River corridor in Yosemite Valley and in Little Yosemite Valley, and recent acoustic surveys by park biologists in 2010 have detected the pallid bat in El Portal, Little Yosemite Valley, and along the South Fork Merced River. In Yosemite, the species shows an association with oak habitat (Rainey and Pierson 1996), mixed deciduous forest (for example, in Yosemite Valley and Wawona), and giant sequoia habitat (Pierson and Heady 1996, Rainey et al. 1992, Pierson et al. 2006). This species occurs at elevations of at least 1,890 meters (6,200 feet) in Yosemite (Pierson and Rainey 1993, 1995, Pierson et al. 2001).

Townsend's Big-Eared Bat (*Corynorhinus townsendii*)

**Status.** California species of special concern

**General Distribution.** The Townsend's big-eared bat occurs throughout the west and is distributed from the southern portion of British Columbia south along the Pacific coast to central Mexico and east into the Great Plains, with isolated populations occurring in the central and eastern United States. In California, the majority of records are from low-to-moderate elevations, although the species has been found to almost 3,000 meters (9,800 feet) in elevation. In the Sierra Nevada, maternity colonies have been found to up over 1,500 meters (5,000 feet) in elevation. The Townsend's big-eared bat is concentrated in areas with mines (particularly in the desert regions to the east and southeast of the Sierra Nevada) or caves (in the northeast portion of California and karstic regions in the Sierra Nevada and Trinity Alps) as roosting habitat (Pierson and Fellers 1998).

**Habitat Requirements.** The Townsend's big-eared bat feeds primarily on small moths, with over 90% of its diet composed of lepidopterans. Foraging associations include edge habitats along streams, adjacent to and within a variety of wooded habitats (Fellers and Pierson 2002, Sherwin 2005). All known nursery sites in the Sierra Nevada occur at relatively low elevations (the highest being at 1,650 meters (5,400 feet) along the Yuba River), although males have been detected much higher (Pierson et al. 2001). Szewczak et al. (1998) reported two nursery roosts in the White Mountains at elevations higher than 1,700 meters (5,500 feet).

**Status in Merced River Corridor.** In Yosemite, Townsend's big-eared bats have been detected at Mirror Lake (Pierson and Rainey 1993), Wawona (Pierson and Rainey 1995), and at the barium mine on U.S. Forest Service (USFS) land in El Portal. This mine is fenced and protected from disturbance. This species was detected within the Merced River corridor at two sites in Yosemite Valley in 1996 and 2004. Acoustic surveys conducted by park biologists in summer of 2010 did not detect this species within the Merced River corridor.

Spotted Bat (*Euderma maculatum*)

**Status.** California species of special concern

**General Distribution.** Although considered one of North America's rarest mammals (Zeiner et al. 1990), the spotted bat is widely distributed throughout much of the western United States, with its range extending as far north as southern British Columbia and as far south as Durango, Mexico (Pierson et al. 2006). In the Sierra Nevada, spotted bats are widely distributed in habitats ranging from desert scrub to montane coniferous forest, with acoustic detections at elevations up to 3,000 meters (9,800 feet) (Pierson et al. 2006).

**Habitat Requirements.** Limited information suggests that spotted bats do not roost in colonies, predominantly in crevices in high cliff faces (Wai-Ping and Fenton 1989). Surveys in the Sierra Nevada suggest that they are most abundant in areas with fractured rock (Pierson and Rainey 1996, 1998a, b). The spotted bat is capable of long distance and rapid flight, thus foraging ranges can be large. Radio-tracking studies in Arizona documented this species traveling up to 40 kilometers each night (Chambers et al. 2005). In montane habitats, the spotted bat forages over meadows, along forest edges, or in open coniferous woodland. Spotted bats feed primarily on large [(5–12 millimeter (0.20 inch–0.47 inch))] moths, particularly noctuids (Chambers and Herder 2005).

**Status in Merced River Corridor.** Studies conducted in Yosemite have shown that spotted bats are relatively abundant in many areas where suitable cliff-roosting habitat is prevalent. The majority of detections are from relatively open foraging settings (such as wet meadows) at lower elevations (for example, Yosemite Valley and Wawona) and from a number of sites with elevations up to 3,000 meters (9,800 feet) (Pierson and Rainey 1993, 1995, 1996, Pierson et al. 2001). Yosemite Valley had the highest population of spotted bats of any location surveyed in California (Pierson and Rainey 1995, 1996). Surveys have revealed spotted bats foraging on the north side of El Capitan Meadow, just below El Capitan, Bridalveil Meadow, Leidig Meadow, and Ahwahnee Meadow (Pierson and Rainey 1993). Pierson and Rainey (1993) suggest that spotted bats roost on or near Half Dome and El Capitan. Acoustic surveys conducted in 2010 detected this species in Yosemite Valley, Little Yosemite Valley, Merced Lake, and along the South Fork Merced River.

Western Red Bat (*Lasiurus blossevillii*)

**Status.** California species of special concern

**General Distribution.** The western red bat is broadly distributed from southern British Columbia in Canada, through much of the western United States, through Mexico and Central America, to Argentina and Chile in South America (Bolster 2005). In California, the majority of records are from the coastal areas from the San Francisco Bay Area south, plus the Central Valley and bordering foothills, with a limited number of records from southern California extending as far east as western Riverside and central San Diego Counties (Pierson et al. 2006). There are a few records from higher elevations and the east side of the Sierra Nevada (Constantine 1998, Pierson et al. 2000). Winter populations of both sexes are concentrated along the central and southern coast (Pierson et al. 1999). Grinnell (1918) suggested that western red bats in California were sexually segregated in summer, with males moving to higher elevations, a pattern more recently noted in other species (e.g., Cryan et al.



2000). Western red bats (most likely males or nonreproductive females) have been documented at elevations up to 2,500 meters (8,200 feet) in the Sierra Nevada (Pierson et al. 2000 and 2001).

**Habitat Requirements.** Western red bats roost on the underside of overhanging leaves. Recent studies in the Central Valley found that summering populations (and breeding females) are substantially more abundant in remnant stands of cottonwood/sycamore riparian that extend greater than 50 meters (164 feet) back from the river than they are in younger, less extensive stands (Pierson et al. 1999). Red bats forage on a number of insect taxa and fly at both canopy height and low over the ground (Shump and Shump 1982). Studies have reported diets consisting of primarily small moths, in addition to a variety of other insects, primarily *Orthoptera* (Ross 1961) but also *Homoptera*, *Coleoptera*, *Hymenoptera*, and *Diptera* (Shump and Shump 1982).

**Status in Merced River Corridor.** The first record of a western red bat in Yosemite was the capture of three individuals (two adult males and one nulliparous female) over the South Fork Merced River on September 16, 1998. Since then, the species has been documented acoustically at multiple localities up as high as Siesta Lake at 2,422 meters (8,000 feet) (Pierson et al. 2001). Previous acoustic detections have been obtained in association with black cottonwood in both Yosemite and Sequoia National Parks; however, acoustic surveys conducted in 2010 did not detect this species within the Merced River corridor.

Western Mastiff Bat (*Eumops perotis*)

**Status.** California species of special concern

**General Distribution.** The subspecies of western mastiff bat that occurs in North America, *E. p. californicus*, ranges from central Mexico across the southwestern United States (parts of California, southern Nevada, Arizona, southern New Mexico and western Texas) (Eger 1977, Bradley and O'Farrell 1967). The western mastiff bat is found along the west side of the Sierra Nevada, primarily at low to mid-elevations but has been detected up to 3,000 meters (9,800 feet) in the summer (Pierson et al. 2006).

**Habitat Requirements.** Western mastiff bats are found in a variety of habitats, from desert scrub and chaparral to montane coniferous forest. Its presence is determined by the availability of significant rock features offering suitable roosting habitat (Pierson et al. 2006). This species may forage in flocks, regularly 30 inches to 60 meters over the substrate and can forage considerable distances from their roosting sites (Siders 2005). Foraging habitats include dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest, grassland, agricultural areas, and high-elevation meadows surrounded by mixed-conifer forests (Siders 2005). The diet of western mastiff bats consists primarily of moths (*Lepidoptera*) but also includes beetles, crickets, and katydids (Siders 2005).

**Status in Merced River Corridor.** In Yosemite, western mastiff bats have been detected in Yosemite Valley in Bridalveil Meadow, El Capitan Meadow, Leidig Meadow, Cook's Meadow, Ahwahnee Meadow, Stoneman Meadow, Wosky Pond, and wetlands near Happy Isles. They were also detected in a few upland habitats east of El Capitan Meadow and Sentinel Beach Picnic Area (Pierson and Rainey 1995). A radio-telemetry study in 1996 detected a large colony in the cliffs west of Cascade Creek (Pierson 1997). Yosemite Valley has the highest population of the western mastiff bat of any

locality surveyed in California (Pierson and Rainey 1995). In addition, the species has been captured in Wawona (Pierson and Rainey 1995). Acoustic surveys conducted in 2010 detected this species in El Portal, Yosemite Valley, Little Yosemite Valley, and Merced Lake.

Sierra Nevada Snowshoe Hare (*Lepus americanus tahoensis*)

**Status.** California species of special concern

**General Distribution.** Sierra Nevada snowshoe hares inhabit the mid-elevations (914 meters to 2,133 meters [3,000 feet to 7,000 feet) of the northern and central Sierra Nevada from approximately Mount Lassen in southeastern Shasta County south through Yosemite National Park to Mono and Mariposa counties (Bolster 1998). They have also been recorded from Nevada in the general vicinity of Lake Tahoe (Hall 1946, Richardson 1954). The southern locality is north of Mammoth in Mono County (Bolster 1998). The population status of the Sierra Nevada snowshoe hare is poorly known.

**Habitat Requirements.** In California, the Sierra Nevada snowshoe hare is primarily found in montane riparian habitats with thickets of alders and willows, and in stands of young conifers interspersed with chaparral. The early seral stages of mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen are likely snowshoe hare habitats, primarily along edges and especially near meadows (Orr 1940, Ingles 1965). This species' abundance is highly cyclic in parts of its range, and may be in California as well, but there is little evidence. They prefer dense cover, either in understory thickets of montane riparian habitats or in shrubby understories of young conifer habitats. The snowshoe hares' summer food primarily consists of grasses, forbs, sedges, and low shrubs (Zeiner et al. 1990). They eat needles and the bark of conifers, and leaves and green twigs of willow and alder in the winter (Wolff 1980).

**Status in Merced River Corridor.** Sierra Nevada snowshoe hare favor dense streamside vegetation. This species typically occurs at elevations below 2,438 meters (8,000 feet); however, its upper elevation limits are unknown. There are a number of apparent sightings from Yosemite above 2,438 meters, although these have not been verified (Yosemite Wildlife Observation Database 2011). Other unconfirmed snowshoe hare sightings within the Merced River corridor include the Merced Lake Ranger Station in 1991 and at the junction of the Merced River and Echo Creek in 1990 (Yosemite Wildlife Observation Database 2011).

Western White-Tailed Jackrabbit (*Lepus townsendii townsendii*)

**Status.** California species of special concern

**General Distribution.** The western white-tailed jackrabbit ranges from the high Sierra crest and upper east slope from the Mount Whitney region at elevations up to 3,657 meters (12,000 feet) in sagebrush, subalpine conifers, alpine dwarf-shrub, and grasslands; it is also found on flat areas east of the mountains, especially in winter.

**Habitat Requirements.** This species inhabits a variety of habitats, including sagebrush, perennial grasslands, alpine dwarf-shrub, and wet meadows to timberline and above, and early successional stages of a variety of conifer habitats, including lodgepole pine, yellow pine, western juniper, dwarf

juniper, red fir, and mixed conifers (Verner and Boss 1980, Williams 1986, Zeiner et al. 1990). In most of these habitats, western white-tailed jackrabbits prefer open or sparsely wooded areas with young or stunted conifers, or scattered shrubs which they use for protective cover during the day (Grinnell and Storer 1924, Verner and Boss 1980, Harris 1982). During the spring through fall, they eat grasses and a variety of herbaceous plants, including cultivated crops (as encountered) (Zeiner et al. 1990). In winter, they prefer buds, bark, and twigs of shrubs, particularly sagebrush, creambush, and small trees (Bailey 1931, Orr 1937).

**Status in Merced River Corridor.** Unverified sightings of western white-tailed jackrabbit within the Merced River corridor include two sightings in Little Yosemite Valley in 1974 and 1975 and a sighting near Merced Lake in 1951 (Yosemite Wildlife Observation Database 2011).

Sierra Nevada Mountain Beaver (*Aplodontia rufa californica*)

**Status.** California species of special concern

**General Distribution.** The Sierra Nevada mountain beaver is endemic and restricted to western North America. Currently seven subspecies are recognized (Dalquest and Scheffer 1945, Hall 1981), including the isolated population *A.r. californica* that extends through much of the Sierra Nevada in eastern California into the western extreme portion of Nevada (Arjo 2007). Sierra Nevada mountain beavers can be found up to 3,000 meters (9,800 feet) in elevation in portions of the Sierra Nevada; however, they are more commonly found at lower elevations in humid, densely vegetated understory areas (Feldhamer et al. 2003). Sierra Nevada mountain beavers are confined to well-vegetated, moist, cool environments and require a large daily intake of water due to their poor ability to concentrate urine and low tolerance for temperature extremes (Nungesser and Pfeiffer 1965).

**Habitat Requirements.** Sierra Nevada mountain beavers require abundant riparian plants for harvesting, but the species composition is relatively unimportant (Todd 1990). Good forage cover (e.g., ferns, forbs, and shrubs) as well as large amounts of small-diameter woody debris or uprooted stumps are usually found in areas selected by Sierra Nevada mountain beaver (Todd 1992, Hacker and Coblenz 1993). Willow (*Salix* sp.), alder (*Alnus* sp.), and fir (*Abies* sp.) dominate areas preferred by mountain beavers in the higher elevations of the Sierra Nevada (Arjo 2007).

**Status in Merced River Corridor.** Todd (1990) estimated that Sierra Nevada mountain beavers occupy approximately 200 to 550 sites in Yosemite. By extrapolating the number of Sierra Nevada mountain beaver sites to the numbers of animals, Todd (1990) estimated from 400 to 6,600 adults living in the park. Of the 41 sites Todd (1990) found occupied by mountain beaver, none fell within the Merced River corridor. Unverified sightings of Sierra Nevada mountain beaver within the corridor include the Civilian Conservation Corps (CCC) camp near El Capitan Meadow in 1993 and along the south fork of the Merced River in Wawona in 1960 (Yosemite Wildlife Observation Database 2011). Although no Museum of Vertebrate Zoology specimens have been taken from within the corridor, several were taken just outside the corridor at the head of Lyell Canyon in 1915 (Museum of Vertebrate Zoology Database 2011). More recently during the Grinnell Resurvey Project, a mountain beaver specimen was recorded from Indian Creek at Chinquapin (Moritz 2007). Mountain beaver sign

was also observed along both Lyell Fork and Maclure Creek (at elevations of 2,987 meters to 3,200 meters or 9,800 feet to 10,500 feet) during the Grinnell Resurvey Project (Moritz 2007).

Sierra Nevada Red Fox (*Vulpes vulpes necator*)

**Status.** California threatened

**General Distribution.** The Sierra Nevada red fox is one of 10 currently recognized red fox subspecies in North America (Hall 1981). *Vulpes vulpes necator* is one of three subspecies of mountain red fox, along with the foxes of the Cascade Mountains (*V. v. cascadiensis*) and the Rocky Mountains (*V. v. macroura*) (Perrine et al. 2010). The Sierra Nevada red fox has historically been found throughout high elevations of the Sierra Nevada from Tulare County northward to Sierra County, and from Mount Shasta and Lassen Peak westward to the Trinity Mountains (Trinity County) (Grinnell et al. 1937). The Sierra Nevada red fox elevation range is approximately 1,200 meters to 3,600 meters (4,000 feet to 11,800 feet); it is seldom observed below 1,500 meters (4,900 feet) and most often is seen above 2,100 meters (6,900 feet) (Grinnell et al. 1937, Perrine et al. 2010). This fox occurs at low densities, even in areas of high relative abundance (Perrine et al. 2010). Current Sierra Nevada red fox distribution and range are uncertain (CDFG 1996); until recently, the Lassen Peak region accounted for the only verified contemporary detections of mountain red fox (Kucera 1993 and 1995, Perrine and Arnold 2001, Perrine 2005). In August 2010, biologists on the Humboldt-Toiyabe National Forest detected a Sierra Nevada red fox at an automatic camera station near Sonora Pass at an elevation of 3,048 meters (10,000 feet) along the border of Tuolumne and Mono counties. Since this detection, three (and possibly five) individual Sierra Nevada red foxes have been detected within 80 miles of this area, with the lowest detection at 1,828 meters (6,000 feet).

**Habitat Requirements.** The Sierra Nevada red fox occupied habitats are typical of the high Sierra Nevada: high-elevation barren, conifer, and shrub habitats, montane meadows, talus slopes, subalpine woodlands, and fell-fields (Perrine et al. 2010, Grinnell et al. 1937, Ingles 1965). Possible den sites include natural cavities in talus slopes or rockslides, earthen dens, boulder piles, or even the space beneath vacant cabins (Grinnell et al. 1937, Aubry 1983). In the winter, Sierra Nevada red foxes may follow the forested edge of openings, possibly avoiding areas where they would be exposed to attack by other carnivores, while ski tracks and other packed snow may also facilitate travel (Perrine et al. 2010). Red foxes are opportunistic predators and scavengers that eat a wide variety of foods, depending on their seasonal availability, including small and medium-sized mammals, birds, insects, invertebrates, fruit, carrion, and garbage (Perrine et al. 2010).

**Status in Merced River Corridor.** Until recently, the last verified Sierra Nevada red fox sighting (confirmed by photograph) near Yosemite National Park occurred during the winter of 1990-1991 at the Tioga Pass Resort 2,940 m (9,645 ft) on the Inyo National Forest, just outside the park (Les Chow, NPS Inventory and Monitoring Network, pers. comm.). However, in the last few years there have been several more detections. In 2009, the CDFG began surveying high-elevation habitats in the southern Cascade and Sierra Nevada ranges for Sierra Nevada red fox with the goal of determining current red fox distribution as well as genetic make-up of existing individuals or populations. Using baited remote, motion-sensing camera stations and passive hair-snaring devices, a total of nine individual Sierra Nevada red foxes have been detected in high elevation wilderness areas in the Sierra (C. Stermer, Pers.

Comm.). In April 2012, a Sierra Nevada red fox was detected on the northern border of Yosemite National Park near Dorothy Lake in Toiyabe National Forest. Surveys targeting other carnivores, such as *Martes*, are not adequate for detecting Sierra Nevada red fox (Perrine et al. 2010). Surveys in the park targeting red fox are being proposed; however, based on previous survey and sighting data, it is unlikely that a significant red fox population exists in Yosemite National Park

California Wolverine (*Gulo gulo*)

**Status.** Federal candidate, California threatened

**General Distribution.** The California wolverine is an uncommon resident of north Coast Range mountains and the Sierra Nevada. Sightings range from Del Norte and Trinity counties east through Siskiyou and Shasta counties, and south through Tulare County (Zeiner et al. 1990). Wolverines have not been scientifically confirmed in California since the 1920s, but a remote camera sighting detected an individual wolverine in Tahoe National Forest in March 2008.

**Habitat Requirements.** Habitats used by the California wolverine in the southern Sierra Nevada include red fir, mixed conifer, lodgepole, subalpine conifer, alpine dwarf-shrub, barren, wet meadows, montane chaparral, and Jeffrey pine, while their elevation range in the southern Sierra Nevada is 2,000 meters to 3,400 meters (6,400 feet to 10,800 feet) (Zeiner et al. 1990). The wolverine uses caves, hollows in cliffs, logs, rock outcrops, and burrows for cover and denning, generally in denser forest stages (Zeiner et al. 1990). The wolverine may dig dens in the snow. Wolverines are hunters and scavengers and feed primarily on small mammals and carrion but might kill large snowbound prey (Grinnell et al. 1937, Ingles 1965). Wolverines have extremely large home ranges; in Montana, their yearly home range was 422 km<sup>2</sup> (156 mi<sup>2</sup>) for males and 388 km<sup>2</sup> (144 mi<sup>2</sup>) for females (Hornocker and Hash 1981).

**Status in Merced River Corridor.** Two California wolverine specimens were collected at the head of Lyell Canyon in 1915, just 2 kilometers from the Merced River corridor (Museum of Vertebrate Zoology Database 2011). There have been three unconfirmed sightings within the corridor; along the south fork of the Merced River in 1959, near Pohono Bridge in 1990, and near the junction of Iron Creek and the Merced River in 1959 (Yosemite Wildlife Observation Database 2011). The likelihood of these latter three sightings being legitimate is highly unlikely, however.

Pacific Fisher (*Martes pennant pacifica*)

**Status.** Federal candidate, California species of special concern

**General Distribution.** Although the historic distribution of Pacific fisher was once contiguous across California and the Pacific Northwest, including the northern Coast range, Klamath Mountains, southern Cascades, and western slope of the Sierra Nevada, the fisher has declined during the past century. Remaining populations are geographically and, in some cases, genetically isolated from one another (Grinnell et al. 1937, Zielinski et al. 1995). Pacific fisher currently occur in only two regions of the state, which are separated by over 430 kilometers: the northwest, including the northern Coast Range and Klamath Province; and the southern Sierra Nevada, including Yosemite National Park

(Zielinski et al. 1995). Yosemite lies at the northern tip of the fisher's southern range. The fisher's elevation range is approximately 1,219 meters to 2,134 meters (4,000 feet to 7,000 feet).

**Habitat Requirements.** The Pacific fisher is one of the most habitat-specific mammals in North America (Buskirk and Powell 1994). Fishers den and bear young in the cavities of large trees or snags and are strongly associated with mid-elevation, mature and late successional coniferous or mixed forests (Powell and Zielinski 1994, Zielinski et al. 2004a, 2004b). In particular, fisher are generally found in stands with high canopy closure, large trees and snags, large wood, large hardwoods, and multiple canopy layers. Fisher generally avoid entering open areas that have no overstory or shrub cover (Buskirk and Powell 1994), while Chow (2009) found that fisher in Yosemite prefer habitat near permanent streams. The fisher has a varied diet consisting primarily of small mammals, such as squirrels, but they also consume porcupines, birds, invertebrates, vegetation, and fruit (Powell and Zielinski 1994).

**Status in Merced River Corridor.** Fisher are elusive and more challenging to detect compared with other carnivores, but recent fisher surveys (2009–2011) conducted in collaboration with U.C. Berkeley have confirmed the presence of 5–8 individual fisher south of the Merced River near Chinquapin, Wawona, Mariposa Grove, and along the South Fork Merced River. Previous fisher surveys in the park conducted by Chow (2009) during 1992–1994 detected relatively few fisher despite the availability of suitable habitat and use of a combination of survey methods, including remote cameras and track plates. Chow (2009) concluded that Pacific fisher inhabit Yosemite at very low population densities. The Merced River may be one of multiple barriers currently preventing northward expansion of their range. Two fisher specimens were collected within the Merced River corridor in Yosemite Valley in 1919 and 1920 (Museum of Vertebrate Zoology Database 2011).

American Badger (*Taxidea taxus*)

**Status.** California species of special concern

**General Distribution.** American badgers are uncommon but found throughout most of California, irrespective of elevation, from the Central Valley over the Sierra Nevada east into the Great Basin. The badger is most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils (Zeiner et al. 1990).

**Habitat Requirements.** The American badger prefers open areas and may also frequent brushlands with little groundcover. During periods of inactivity, badgers occupy underground burrows. They frequently reuse old burrows, although some may dig a new den each night, especially in summer (Messick and Hornocker 1981). They are usually found in relatively dry grasslands and open forests (Rahme et al. 1995) and may be active at any hour but are mainly nocturnal. Badgers feed primarily on small rodents usually captured by digging out their burrows. Their main prey species includes ground squirrels, pocket gophers, kangaroo rats, prairie dogs, and mice. Badgers also eat reptiles, insects, earthworms, eggs, birds, and carrion, especially when ground squirrel populations are low (Messick and Hornocker 1981, Zeiner et al. 1990). The American badger is active all year, but it may sleep in its den for several days or weeks during severe winter weather (Nowak 2005).

**Status in Merced River Corridor.** Unverified American badger sightings within the Merced River corridor include the CCC Camp in El Capitan Meadow in 1993, at the Yosemite Valley Visitor Center in 1954 (Yosemite Wildlife Observation Database 2011), and in Wawona in 2004 (California Natural Diversity Database 2012).

Sierra Nevada Bighorn Sheep (*Ovis canadensis sierrae*)

**Status.** Federal Endangered, California Endangered, California Fully Protected

**General Distribution.** Sierra Nevada bighorn sheep use habitats ranging from the highest elevations along the crest of the Sierra Nevada (4,000 meters [13,120 feet]) to winter ranges at the eastern base of the range as low as 1,450 meters (4,760 feet) (USFWS 2007). The Sierra Nevada bighorn sheep population has increased from a low of 100 individuals in 1995 to more than 400 animals since the species was listed as endangered under the federal ESA in 1999. The Yosemite Recovery Unit consists of approximately 40 individuals at high elevations along the northeastern section of Yosemite.

**Habitat Requirements.** Habitats used by Sierra Nevada bighorn sheep include alpine dwarf-shrub, low sage, sagebrush, bitterbrush, pinyon-juniper, palm oasis, desert riparian, desert succulent shrub, desert scrub, subalpine conifer, perennial grassland, montane chaparral, and montane riparian (DeForge 1980, Monson and Sumner 1980, Wehausen 1980). Bighorn sheep use rocky, steep terrain for escape and bedding and remain near rugged terrain while feeding in open habitat (Zeiner et al. 1990). Low-elevation winter ranges provide this species an important source of high quality forage early in the growing season (USFWS 2007). They use steep, rugged slopes and canyons for lambing areas (Wehausen 1980).

**Status in Merced River Corridor.** Historically, bighorn sheep occupied alpine and subalpine areas along the Sierra Crest and in the Cathedral Range. It is generally believed that they seasonally migrated from the crest to winter on the eastern escarpment. Given that they occupied the Cathedral Range, it is very likely that bighorn sheep historically occupied the upper reaches of the Merced River drainage. A Museum of Vertebrate Zoology specimen was taken from the east lobe of Lyell Glacier within 1 kilometer (0.62 mile) of the Merced River corridor in October 1933. Another specimen was taken within 3 kilometers of the river corridor east of Crescent Lake near Wawona in 1921 (Museum of Vertebrate Zoology Database 2011). In 1976, a bighorn sheep was sighted near Donohue Pass, approximately 3.5 kilometers northeast of the Merced River corridor (Yosemite Wildlife Observation Database 2011). Although rams might occasionally (rarely) wander into the upper (along the crest) Merced River drainage, it is highly unlikely that bighorn sheep currently occupy the Merced River drainage (Chow, pers. comm.). In addition, bighorn sheep critical habitat (designated in 2008 by USFWS) does not occur within the Merced River corridor.

## **Plants**

Spurred snapdragon (*Antirrhinum leptaleum*)

**General Ecology and Distribution.** Spurred snapdragon, an annual herb, is endemic to California and limited to the seasonally moist areas in the foothill and Sierra Nevada counties between 300 and 1,200 meters.



*Habitat and Status in the Project Area.* The snapdragon is restricted to small washes and shallow ditches in disturbed areas in Foresta and Wawona.

Lemmon's wild ginger (*Asarum lemmonii*)

*General Ecology and Distribution.* This perennial herb in the birthwort family is endemic to California and is found in yellow pine forests, red fir forests, and wetland-riparian habitats within the park between 1,100 and 1,900 meters. It occurs almost always under natural conditions in wetlands.

*Habitat and Status in the Project Area.* Lemmon's wild ginger occurs in shady wet places along creeks and north-facing river banks; it is found in Yosemite Valley and Wawona.

California bolandra (*Bolandra californica*)

*General Ecology and Distribution.* This perennial herb in the saxifrage family is endemic to California and is restricted to lower and upper montane coniferous forests within the park, in mesic areas and rocky soils. It is restricted to elevations between 2,000-3,000 meters.

*Habitat and Status in the Project Area.* The California bolandra occurs at Lyell Fork of the Merced River in Segment 1 of the Merced River corridor.

Threadleaf beakseed (*Bulbostylis capillaris*)

*General Ecology and Distribution.* Threadleaf beakseed is a monocot annual herb in the sedge family; it is native to California and occurs in yellow pine forests and wetland-riparian habitats at elevations between 1,000-2,000 meters.

*Habitat and Status in the Project Area.* The threadleaf beakseed occurs in meadows and seeps, meadow habitats, and vernal moist areas. It is found in Yosemite Valley (Segment 2).

Mono Hot Spring evening primrose (*Camissonia sierrae* ssp. *alticola*)

*General Ecology and Distribution.* This annual herb in the evening primrose family is endemic to California and is found in lodgepole and red fir forests (lower and upper montane coniferous forests) in granitic, gravel and sand pans. The Mono Hot Spring evening primrose is found at elevations of 2,000-2,350 meters.

*Habitat and Status in the Project Area.* This evening primrose is found on vernal moist gravel and sand pans and at Merced Lake in Segment 1.

Sierra suncup (*Camissonia sierrae* ssp. *sierrae*)

*General Ecology and Distribution.* This annual herb in the evening primrose family is endemic to California and is restricted to cismontane woodlands and lower montane coniferous forests at elevations between 500 and 1,300 meters.

*Habitat and Status in the Project Area.* The milkvetch occurs on granite gravel seepage areas within Yosemite Valley.

Buxbaum's sedge (*Carex buxbaumii*)

*General Ecology and Distribution.* Buxbaum's sedge is a monocot and perennial herb in the sedge family. It occurs in montane and subalpine fens. It favors wet conditions in meadow habitats at elevations between 1,200-3,300 meters.

*Habitat and Status in the Project Area.* Buxbaum's sedge occurs in Yosemite Valley.

Silvery sedge (*Carex canescens*)

*General Ecology and Distribution.* This monocot, perennial herb belongs to the sedge family and is found throughout the Sierra Nevada as well as other mid- to high-elevation sites in North America. It occurs in meadow and perennially moist areas in subalpine and alpine forests at elevations between 1,000-3,200 meters.

*Habitat and Status in the Project Area.* The silvery sedge is found in lake margins and drainages in wet meadows. Historic collections were taken from Wawona, where this species is commonly found (Segment 7).

Cleft sedge (*Carex fissuricola*)

*General Ecology and Distribution.* This perennial herb in the sedge family is native to California, but is confined to western North America. It is found in red fir and subalpine forests and wetland-riparian habitats at elevations between 1,500 and 3,500 meters.

*Habitat and Status in the Project Area.* This sedge occurs in meadow slopes and flats, among rocks, wet areas, and spray zones. It is found at Nevada Falls within Segment 1.

Yosemite sedge (*Carex sartwelliana*)

*General Ecology and Distribution.* This perennial herb in the sedge family is endemic to California and occurs in yellow pine and red fir forests, as well as wetland-riparian habitats at elevations of 1,200 to 2,600 meters.

*Habitat and Status in the Project Area.* This sedge is found in meadow borders and moist forest openings. It can be found at Wildcat Creek and in Segments 1, 2, 5, and 7.

Thompkins' sedge (*Carex tompkinsii*)

*General Ecology and Distribution.* This perennial herb in the sedge family is endemic to California and occurs in chaparral, foothill woodland, red fir forest, and yellow pine forest habitats at elevations of 1,200 to 1,800 meters.

*Habitat and Status in the Project Area.* It is found in canyon slopes and river bottomlands under conifer-oak woodland canopy. This species occurs in the El Portal area (Segment 4).

Bolander's woodreed (*Cinna bolanderi*)

*General Ecology and Distribution.* This perennial herb in the grass family is endemic to California and occurs in wetland-riparian habitat, but occasionally is found in non wetlands. It is found in elevations ranging between 1,670 to 2,440 meters.

*Habitat and Status in the Project Area.* Bolander's woodreed is found in montane stringer meadows and fens in Wawona and Little Yosemite Valley (Segments 7 and 1, respectively).

Narrow leaf Collinsia (*Collinsia linearis*)

*General Ecology and Distribution.* This annual herb in the plantain family is primarily limited to California, with some extensions into adjacent states. It is found in lower- to mid-elevation (200 to 2,000 meters) coniferous forests on rock outcrops and dry slopes. It reaches the southern extent of its range in Mariposa County.

*Habitat and Status in the Project Area.* Narrow leaf collinsia is found in El Portal and Wawona (Segments 4 and 7, respectively), where it is restricted to dry, metamorphic rock outcrops along the metamorphic-granitic contact zone.

Short-bracted bird's beak (*Cordylanthus rigidus* ssp. *brevibracteus*)

*General Ecology and Distribution.* Short-bracted bird's beak is an annual herb in the broomrape family and is endemic to California. It is widely distributed in the Sierra Nevada from Mariposa County southward to Kern County at elevations ranging between 1,100 to 2,500 meters.

*Habitat and Status in the Project Area.* This plant occurs on the north side of Yosemite Valley, where it receives full sun on dry sandy roadside habitats. Known populations occur one mile east of Cascade Creek in Segment 2 (Yosemite Valley).

Mountain lady's slipper (*Cypripedium montanum*)

*General Ecology and Distribution.* Mountain lady's slipper is a perennial herb in the orchid family; it is native to California and is confined to western North America in yellow pine forests, mixed evergreen forests, and wetland-riparian habitats at elevations between 200 to 2,200 meters. In the Sierra Nevada, it occurs in Tuolumne, Mariposa, and Madera Counties. It also occurs in northwestern California, the Cascade Range, southwest San Francisco Bay Area, and Modoc Plateau.

*Habitat and Status in the Project Area.* This herb occurs on deep humus and shade of canyon bottoms. It is found in Wawona and below Yosemite Valley.

Stream orchid (*Epipactis gigantea*)

*General Ecology and Distribution.* This species, a perennial herb in the orchid family, is widely distributed throughout California and North America. In Yosemite, it is restricted to moist granitic ledges and planted in landscaped areas at elevations between 1,500 to 2,600 meters.

*Habitat and Status in the Project Area.* This species occurs in Yosemite Valley within a number of landscaped areas. Former populations above Happy Isles were obliterated by the rockfall in 1996. Natural habitat for this species exists throughout the Valley in perennially moist, shaded areas.

Congdon's woolly-sunflower (*Eriophyllum congdonii*)

*General Ecology and Distribution.* This species, a native annual herb in the aster family, is endemic to California and restricted to Mariposa County. It is found on dry, mostly south-facing metamorphic and metasedimentary outcrops in chaparral and oak woodlands. It is endemic to the main stem of the Merced River canyon near El Portal and the South Fork of the Merced River downstream of Wawona at elevations between 500 to 1,900 meters.

*Habitat and Status in the Project Area.* Habitat for this species occurs on sunny rocky slopes next to the river in El Portal (Segment 4).

Purple fawn-lily (*Erythronium purpurascens*)

*General Ecology and Distribution.* This perennial herb is endemic to California and the Sierra Nevada. It grows along shaded streams and river corridors in montane coniferous forests at elevations of 1,500 to 2,700 meters.

*Habitat and Status in the Project Area.* This species is known from riparian corridors in the eastern end of Yosemite Valley. It was collected in the past for its showy flowers and is possibly extinct.

Northern mannagrass (*Glyceria borealis*)

*General Ecology and Distribution.* This perennial herb in the grass family is native to California and is also found elsewhere in North America and beyond. It occurs in yellow pine and red fir forests, as well as wetland-riparian habitats. In Yosemite, it is found in elevations ranging between 800-1,250 meters.

*Habitat and Status in the Project Area.* Northern managrass grows in marshes and shallow lake borders in Yosemite Valley (Segment 2).

California sunflower (*Helianthus californicus*)

*General Ecology and Distribution.* This perennial herb in the aster family is native to California and is confined to western North America. It occurs in foothill woodland, valley grassland, freshwater wetlands, and wetland-riparian habitats at elevations ranging between 1,600 and 2,000 meters.

*Habitat and Status in the Project Area.* California sunflower grows along streambanks, within meadows and freshwater marshes, seeps, and seasonally inundated areas. It occurs in Wawona (Segment 7).

Common mare's tail (*Hippuris vulgaris*)

*General Ecology and Distribution.* This perennial aquatic herb in the plantain family is native to California but is also found elsewhere in North America and beyond. It occurs in a variety of habitats, including yellow pine, red fir, lodgepole, and subalpine forests; foothill woodland, chaparral, valley grassland, and wetland-riparian habitats at elevations ranging between 0 to 2,600 meters. It occurs almost always under natural conditions in wetlands.

*Habitat and Status in the Project Area.* This species occurs within lakes, ponds, springs, rivers in Little Yosemite Valley (Segment 1).

Redray alpinegold (*Hulsea heterochroma*)

*General Ecology and Distribution.* This perennial herb in the aster family is native to California and elsewhere outside of California, but is confined to western North America. It occurs in chaparral and openings in yellow pine forests between 300 and 2,500 meters in elevation.

*Habitat and Status in the Project Area.* This species occurs in Yosemite Valley and 5 miles above Nevada Fall (Segments 2 and 1, respectively).

Western quillwort (*Isoetes occidentalis*)

*General Ecology and Distribution.* This fern is native to California and belongs to the quillworts family. It occurs in wetland-riparian habitats in the high Sierra Nevada, Klamath Ranges within California at elevations between 1,500 and 2,500 meters. Outside of California, it can be found in British Columbia and Colorado.

*Habitat and Status in the Project Area.* Western quillwort occurs in mountain lakes and rivers. In the Project Area, it is found in Segment 1 (Little Yosemite Valley).

Sierra laurel (*Leucothoe davisiae*)

*General Ecology and Distribution.* This shrub, a perennial in the heath family, is found slightly beyond California's boundaries and is restricted to wetland, bog, and moist habitats at elevations between 1,300 and 2,600 meters.

*Habitat and Status in the Project Area.* Within the Merced River corridor, Sierra laurel is found in moist, shaded drainage bottoms along creeks and rivers within Yosemite Valley (Segment 2).

Congdon's lewisia (*Lewisia congdonii*)

*General Ecology and Distribution.* This perennial herb in the montia family is endemic to California and occurs in chaparral, foothill woodland, red fir forest, and yellow pine forest. It is only found within Mariposa and Fresno Counties at elevations between 500 and 2,800 meters.

*Habitat and Status in the Project Area.* This species is known from approximately ten occurrences in the canyons of the Kings and Merced Rivers. In the Project Area, it occurs on metamorphic cliffs within lower montane coniferous forests in El Portal (Segment 3).

False pimpernel (*Lindernia dubia* var. *anagallidea*)

*General Ecology and Distribution.* This annual herb in the plantain family is found in freshwater wetlands and meadows at low to mid elevations (500 to 1,600 meters) in California and North America.

*Habitat and Status in the Project Area.* False pimpernel is found in meadow soils throughout Yosemite Valley (Segment 2) that remain moist for the duration of the plant's seasonal life span.

Tanoak (*Lithocarpus densiflorus* var. *echinoides*)

*General Ecology and Distribution.* Tanoak is a tree or shrub in the oak family and is native to California. It occurs on dry shady forest conditions in slope habitats at elevations ranging between 600 and 2,000 meters.

*Habitat and Status in the Project Area.* Tanoak occurs along the Merced River below Yosemite Valley (Segment 2) and in the El Portal area (Segment 3).

Northern bugleweed (*Lycopus uniflorus*)

*General Ecology and Distribution.* This perennial herb in the mint family is native to California and is also found elsewhere in North America and beyond. It occurs in freshwater wetlands and wetland-riparian habitat at elevations ranging between 1,600 and 2,000 meters.

*Habitat and Status in the Project Area.* Northern bugleweed occurs in moist areas, marshes, adjacent to springs, and along the Merced River banks from El Portal up to the Merced Gorge (Segments 4 and 3, respectively).

Yellow and white monkeyflower (*Mimulus bicolor*)

*General Ecology and Distribution.* Yellow and white monkeyflower, an annual herb from the lopseed family, is endemic to California. It occurs in foothill woodland, yellow pine forest, and chaparral habitats at elevations ranging between 360 and 2,100 meters.

*Habitat and Status in the Project Area.* This species occurs under vernal moist conditions, usually in non-wetlands, but occasionally found in wetlands and river bottomlands. In the Project Area, it is found in Wawona (Segment 7).

Small flowered monkeyflower (*Mimulus inconspicuus*)

*General Ecology and Distribution.* This annual herb in the lopseed family is endemic to California. It is restricted to wetlands and seasonally moist sites in lower montane forests and foothill woodlands in partial shade at elevations between 160 and 2,000 meters.

*Habitat and Status in the Project Area.* Small flowered monkeyflower occurs at the mouth of Moss Creek and also in Segments 2, 3, 7, and 8.

Cutleaf monkeyflower (*Mimulus laciniatus*)

*General Ecology and Distribution.* This annual herb in the lopseed family is endemic to California. It typically occurs in red fir and yellow pine forests and wetland-riparian habitats at elevations ranging between 900 and 2,000 meters.

*Habitat and Status in the Project Area.* Cutleaf monkeyflower occurs in chaparral, lower and upper montane coniferous forests, vernal moist seepage areas, and mesic areas with granitic substrate in Yosemite Valley (Segment 2).

Yellow-lip pansy monkeyflower (*Mimulus pulchellus*)

*General Ecology and Distribution.* This annual herb in the lopseed family is endemic to California and limited to Mariposa, Tuolumne, and Calaveras Counties. It is restricted to wetlands and seasonally moist sites at elevations ranging between 600 and 2,000 meters.

*Habitat and Status in the Project Area.* This species occurs in vernal mesic meadows and lower montane coniferous forests within Yosemite Valley (Segment 2).

Sierra sweet-bay (*Myrica hartwegii*)

*General Ecology and Distribution.* This perennial shrub in the wax-myrtle family is endemic to California. It is limited in occurrence to streambanks and riparian communities at low to moderate elevations (300 to 1,500 meters) in the Sierra Nevada, where it forms small thickets along the river.

*Habitat and Status in the Project Area.* Patchy distribution of Sierra sweet-bay occurs along the South Fork of the Merced River through Wawona as well as along tributaries to the South Fork and Big Creek near the South Entrance Station.

California bog asphodel (*Narthecium californicum*)

*General Ecology and Distribution.* This perennial shrub in the Nartheciaceae family and is endemic to California. It occurs along streambanks and in meadows within yellow pine, red fir, and douglas-fir forests, as well as wetland-riparian habitat. Elevation range for this species is between 700 to 2,600 meters.



*Habitat and Status in the Project Area.* This species occurs in fens, seeps, and adjacent to streams and waterfalls. In the Project Area, it can be found at Bridalveil Falls in Yosemite Valley (Segment 2).

Azure penstemon (*Penstemon azureus* ssp. *angustissimus*)

*General Ecology and Distribution.* This perennial herb in the plantain family is endemic to California and is near its southern extent in Yosemite. It is generally found in moist woodlands and open forests at lower to moderate elevations in the Sierra Nevada at elevations of 300 to 700 meters.

*Habitat and Status in the Project Area.* This herb is found in scattered locations in Yosemite Valley (Segment 2). It was first described from collections taken in Yosemite Valley, although that original population appears to have disappeared.

Purdy's foothill penstemon (*Penstemon heterophyllus* var. *purdyi*)

*General Ecology and Distribution.* This perennial herb in the plantain family is endemic to California. It is generally found under dry conditions in slope habitats of chaparral, foothill woodland, and yellow pine forest habitats. It occurs at elevations of 50 to 1,600 meters.

*Habitat and Status in the Project Area.* This penstemon occurs in Yosemite Valley (Segment 2).

Tansy Leafed Phacelia (*Phacelia tanacetifolia*)

*General Ecology and Distribution.* This annual herb in the borage family is found throughout California and is confined to western North America. It grows in seasonally moist, sandy and gravelly open areas.

*Habitat and Status in the Project Area.* This species occurs at scattered locations throughout Yosemite Valley at elevations of 1,000 to 2,000 meters, where it blooms and sets seed early each spring.

Whitebark pine (*Pinus albicaulis*)

*General Ecology and Distribution.* Whitebark pine, a tree from the pine family, is native to California. It occurs in subalpine and upper montane forests at elevations ranging between 3,000 to 3,750 meters. It is considered a keystone species and a major food source for many species of birds and mammals. Whitebark pine is rapidly declining throughout most of its range, primarily due to a combination of white pine blister rust, periodic mountain pine beetle outbreaks, fire suppression, and climate change (Natural Resources Defense Council [NRDC], 2008 and Fryer, 2002).

*Habitat and Status in the Project Area.* This species occurs on cold and windy, high-elevation sites in isolated stands in the subalpine zone. However, it also co-occurs with a diversity of conifers that vary by location and elevation (NRDC, 2008 and Fryer, 2002). In the Project Area, it is found in Segments 1, 2, and 5 (Merced River above Nevada Fall, Yosemite Valley, and South Fork above Wawona, respectively).

Coleman's piperia (*Piperia colemanii*)

*General Ecology and Distribution.* This perennial native herb is endemic to California and limited to the high North Coast Ranges, high Cascade Range, and the Sierra Nevada. It grows on sandy substrates in lower montane coniferous forests and is also found in chaparral habitat at 1,200-2,300 meters in elevation.

*Habitat and Status in the Project Area.* This species occurs in Little Yosemite Valley (Segment 1).

Torrey's popcornflower (*Plagiobothrys torreyi* var. *torreyi*)

*General Ecology and Distribution.* This annual herb in the borage family is endemic to California and occurs in Mariposa, Fresno, and Kern Counties. Suitable habitat includes meadows within yellow pine, red fir, and lodgepole pine forests, as well as subalpine forests at elevations ranging between 1,200 and 3,400 meters.

*Habitat and Status in the Project Area.* This herb is found within moist meadows and flats, as well as forest edges within Yosemite Valley (Segment 2).

Nuttall's pondweed (*Potamogeton epihydrus* [previously *P. ephydrus* ssp. *nuttallii*])

*General Ecology and Distribution.* This perennial herb in the pondweed family is native to California at elevations ranging between 400 and 1,900 meters; it occurs in the outer North Coast Ranges, high Sierra Nevada, Modoc Plateau, and elsewhere in North America.

*Habitat and Status in the Project Area.* Nuttall's pondweed is restricted to freshwater wetlands and wetland-riparian habitats. In Yosemite Valley (Segment 2), it can be found in freshwater marshes and tanks.

Valley oak (*Quercus lobata*)

*General Ecology and Distribution.* This tree is endemic to California and occurs throughout California, with the exception of eastern California and desert areas.

*Habitat and Status in the Project Area.* Valley oak occurs on deep soil on slopes and in valleys. It is known from a few majestic specimens in El Portal (Segment 4) at elevations of approximately 720 meters.

Wood saxifrage (*Saxifraga mertensiana*)

*General Ecology and Distribution.* This perennial herb in the saxifrage family is endemic to California and limited to the northern and central Sierra Nevada at elevations of 1,000 to 2,500 meters. It reaches its southern extent in Mariposa County, where it grows on mossy rocks and moist cliffs in lower to montane coniferous forests.

*Habitat and Status in the Project Area.* This species occurs at scattered locations in moist, shaded sites throughout Yosemite Valley (Segment 2).

Oregon saxifrage (*Micranthes oregana* (previously *Saxifraga oregana*))

*General Ecology and Distribution.* This perennial herb in the saxifrage family is native to California but is also found in other areas of western North America. It occurs in meadows within yellow pine, red fir, lodgepole pine, and subalpine forests, as well as wetland-riparian communities at elevations of 150 to 2,500 meters.

*Habitat and Status in the Project Area.* This species occurs in meadows and seeps, almost always under wet conditions, in Yosemite Valley and Little Yosemite Valley (Segments 2 and 1, respectively).

Bolander's skullcap (*Scutellaria bolanderi*)

*General Ecology and Distribution.* This perennial herb in the mint family is endemic to California. It is primarily found in lower montane forests in the Sierra Nevada, where it occurs in gravelly soils along streambanks and in California black oak woodlands and ponderosa pine forests at elevations between 300-2,000 meters.

*Habitat and Status in the Project Area.* This species is known from isolated populations scattered throughout the Wawona basin (Segment 7).

Clark's ragwort (*Senecio clarkianus*)

*General Ecology and Distribution.* This perennial herb in the aster family is endemic to California and occurs in red fir and lodgepole forests, as well as wetland-riparian habitats at elevations ranging between 1,400 and 2,700 meters.

*Habitat and Status in the Project Area.* It occurs in damp montane meadows within Wawona (Segment 7).

Small bur reed (*Sparganium natans*)

*General Ecology and Distribution.* This perennial herb in the Typhaceae family is native to California, but is also found elsewhere in North America and beyond. It occurs at lake margins and edges of freshwater wetlands and wetland-riparian habitats at elevations ranging between 2,000 and 2,500 meters.

*Habitat and Status in the Project Area.* This species is found in tributaries of the Merced River in Segments 2 and 7 (Yosemite Valley and Wawona, respectively).

Sierra bladdernut (*Staphylea bolanderi*)

*General Ecology and Distribution.* This tree or shrub belongs to the Staphyleaceae and is endemic to California; it occurs in canyons within chaparral, foothill woodland, and yellow pine forest communities at elevations between 240 and 1,720 meters.

*Habitat and Status in the Project Area.* This species occurs in shaded canyon habitats along the Merced River Canyon in El Portal and the Merced Gorge Area (Segments 4 and 3, respectively).

Narrowleaf trillium (*Trillium angustipetalum*)

*General Ecology and Distribution.* This perennial herb in the Melanthiaceae family is almost entirely restricted to California. It is most common in the coastal ranges of the state, but occurs in limited, small populations in the Sierra Nevada where it is found in shady areas within mature montane coniferous forests with well-developed duff and litter layers. Elevations range from 100 to 2,000 meters. This species may be at risk due to the lack of natural fire patterns, which allows an unnatural buildup of duff and litter to the exclusion of the plant, as well as overly intense fire behavior resulting in loss of root and plant materials through overheating.

*Habitat and Status in the Project Area.* This species is scattered over a 10-acre area along the south side of the South Fork of the Merced River in Wawona (Segment 7), near the eastern end of River Road. It also occurs in Yosemite Valley (Segment 2).

California red huckleberry (*Vaccinium parvifolium*)

*General Ecology and Distribution.* This shrub belongs to the heath family and is endemic to California. It occurs in canyons within redwood forest, red fir forest, and mixed evergreen forest communities at elevations between 1,400 and 2,500 meters.

*Habitat and Status in the Project Area.* This species prefers moist, shaded drainage bottoms along creeks and rivers. It occurs in Wawona (Segment 7).

Hall's wyethia (*Wyethia elata*)

*General Ecology and Distribution.* This species, a perennial herb in the aster family, is endemic to California. It is restricted to the southern Sierra Nevada foothills and lower montane forests at elevations between 1,000 and 1,400 meters and reaches the northern extent of its range in Yosemite.

*Habitat and Status in the Project Area.* It is found in open woodlands and forests in the Wawona basin (Segment 7).

### ***Environmental Consequences Methodology***

The impact evaluation for special status species is based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the study area; (2) the direct physical loss or adverse modification of habitat; (3) the effective loss of habitat (through avoidance or abandonment) due to construction activity or noise, or species sensitivity to human disturbance.

Impacts on listed or candidate species will be analyzed in accordance with USFWS guidelines. Federal agencies must consult with the USFWS to ensure their actions would not jeopardize the continued existence of any federally listed or proposed threatened or endangered species, or adversely modify designated or proposed critical habitat (ESA section 7 (a) (2)).

If listed species or their critical habitat has the potential to be affected by proposed actions, the federal agency must determine if the action would have adverse impacts on species and/or critical habitats. This analysis has three possible conclusions for listed species and designated critical habitat.

1. **No Effect** – the appropriate conclusion if the project (or action) is located outside suitable habitat and there would be no disturbance or other direct, indirect, or cumulative impacts on the species. The action would not affect the listed species or its designated critical habitat.
2. **May Affect, Not Likely to Adversely Affect** – the appropriate conclusion when effects on a listed species or critical habitat are expected to be *discountable*, *insignificant*, or completely *beneficial*.
  - a. **Beneficial effects** – contemporaneous positive effects without any adverse effects.
  - b. **Insignificant effects** – relate to the size of the impact and should never reach the scale where take would occur.
  - c. **Discountable effects** – those that are extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur.
3. **May Affect, Likely to Adversely Affect** – the appropriate conclusion if any adverse effect may occur to listed species or critical habitat as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial.

In the case of *proposed* species or *proposed* critical habitat, the possible conclusions are:

1. **Proposed Species**
  - a. likely to jeopardize the continued existence
  - b. not likely to jeopardize the continued existence
2. **Proposed Critical Habitat**
  - a. likely to destroy or adversely modify
  - b. not likely to destroy or adversely modify

The effects analysis includes assessment of the following:

1. direct and indirect effects (including stressors and subsidies) of the action(s) under consultation, including conservation and minimization measures
2. direct and indirect effects (including stressors and benefits) of interrelated or interdependent actions
3. the effects of the action on the species when *added to* the environmental baseline and cumulative effects in the action area

Under the ESA, direct effects are those that are caused by the action(s) and occur at the time of the action(s), and indirect effects are those that are caused by the action(s) and are later in time, but are

still reasonably certain to occur. For an ongoing action, such as operation of a tidal gate, the distinction between direct and indirect effects may be difficult to finely distinguish. What is critical is that the scope of the analysis considers stressors and subsidies that occur beyond when (and where) an action initially occurs.

The NPS makes the determination of effect for the alternatives following guidance outlined in the *Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conference Activities* (USFWS and NMFS 1998). Although special status species include state listed and sensitive species, park sensitive species, and species with other federal (i.e., Bureau of Land Management or Forest Service sensitive), state, or local special status, in addition to species protected under the federal ESA, impacts are determined following the same guidance. A biological assessment was presented to the USFWS in compliance with section 7 of the federal ESA in January 2000. A revised Biological Assessment, based on this *Merced River Plan/DEIS*, will be submitted to the USFWS.

In addition, the impacts on special status species were evaluated in terms of the NEPA and NPS Director's Order 12 considerations of the context, duration, intensity, and type of impacts, as defined below. This impact assessment considers the potential effects that implementation of the Merced River Plan could have on special status species. Information on habitats and species in the study area derives from the Yosemite Parkwide Vegetation Map (1997) and other studies, including the *Wildlife Conditions Assessment for the Merced River Corridor in Yosemite Valley, Yosemite National Park* (NPS 2011c), the *Special Status Wildlife Species Report for the Merced River Corridor in Yosemite National Park* (NPS 2011a), and the *Status of Rare Plants in the Merced River Corridor within Yosemite National Park* (Colwell and Taylor 2011b). Quantitative analysis was used wherever possible; however, when quantitative analysis was not feasible, qualitative analysis was used. Qualitative analysis relies substantially on professional judgment, supported by extrapolation of relevant research, where appropriate, to reach reasonable conclusions as to the context, intensity, duration, and type of potential impact.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the Merced River. This analysis will further identify if there would be local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area within Yosemite National Park. Regional impacts would have an influence in a Sierra-wide context. Context suggests that certain impacts depend on the setting of the proposed action. For instance, impacts that would reduce the connectivity between habitat types could be minor if such connections are abundant in a given region, moderate or major if they are not.
- **Intensity.** Impacts can be adverse or beneficial. A negligible impact means that special status species would not be affected, or effects would not be measurable. A minor impact would be detectable; both short-term and long-term impacts could potentially affect breeding success and habitat availability. Mitigation measures would be sufficient to offset minor adverse effects. A moderate impact would be readily apparent and would result in the reduction or expansion of potential habitat required to meet life requisite needs of one or more species. Mitigation would be required to offset moderate adverse impacts. A major impact would be readily apparent and would result in the direct or indirect gain or loss of occupied breeding

sites, take of individuals, or changes to habitat affecting potential for occupancy or reproductive potential. Extensive mitigation would be necessary to offset adverse effects and its success could not be guaranteed. Impacts to rare, threatened, and endangered species would be quantified where possible by determining the acreage of habitat for each species altered. The amount of each habitat type that would be directly affected would be determined by a comparative analysis of suitable habitat spatial data representing existing conditions and conditions under proposed management actions. Effects associated with habitat distribution and patch size will also be addressed quantitatively where baseline data are available to support such an analysis. Other potential direct and indirect effects to rare, threatened, and endangered species habitats, such as effects associated with invasive species or the potential for disturbance to populations due to increases in human activity, will be analyzed qualitatively.

- **Duration.** A short-term impact would have an immediate effect on native habitat, diversity, and native populations but would not cause long-term declines in populations or diversity. Short-term impacts are normally associated with transitional types of activities, such as facility construction. Long-term impacts would lead to a loss of native habitat, diversity, and species populations as exhibited by a decline in species abundance, viability, and/or survival.
- **Type.** The type of impact considers whether the impact would be beneficial or adverse. Adverse impacts are those that alter the range, location, number, or population of a species or its habitat. Beneficial impacts would improve one or more of these characteristics.

### ***Environmental Consequences of Alternative 1 (No Action)***

The following discussion provides an overview of the types of impacts to rare, threatened, and endangered species that could occur within each segment of the Merced River corridor from application of Alternative 1 (No Action).

#### **All River Segments**

Alternative 1 (No Action) would be a continuation of current conditions and management. There would be no comprehensive changes to the management of the Merced River corridor. Under Alternative 1, the NPS would retain (and potentially revise) current management policies pertaining to rare, threatened, and endangered species.

There are 50 special status plant species and 33 special status wildlife species known to occur or have the potential to occur within the Merced River Wild and Scenic River corridor in Yosemite. Tables 9-55 and 9-56 in the “Affected Environment” subsection provide information regarding species designation, habitat requirements, and potential location within the study area.

#### ***Impacts of Actions to Protect and Enhance River Values***

All riprap and abandoned infrastructure within the Merced River channel and meadow floodplains would remain, which may continue to alter the free-flowing condition of the river and constrain the river from naturally migrating and changing course. Although some large wood would be left in place within the river channel, the park would continue to remove large wood where there are threats to human safety or infrastructure. This action would continue to influence habitat characteristics within



the channel, such as riffle/pool complexes, cover for aquatic species, and stability of riverbanks. These ongoing effects would be long term and negligible to those species using the aquatic habitats associated with the Merced River (California Wildlife Habitat Relationships System [WHR]: riverine); this potentially includes hardhead and western pond turtle.

Informal meadow trails would largely remain under Alternative 1 (No Action). Riparian habitat would continue to be protected at current levels. However, riverbank erosion and scouring effects associated with existing bridges would continue as well as continued visitor presence along sensitive banks of the Merced River. Conifer encroachment into meadows would continue to be managed with fire reintroduction. These ongoing effects, with the exception of managing encroaching conifers, would result in continued impacts on meadow and riparian habitats, including habitat fragmentation, reduced productivity of riparian and adjacent aquatic communities, and potential disruption of connectivity between terrestrial and aquatic habitats. These ongoing effects would be long term and negligible to those species using the meadow and riparian habitats (WHR: wet meadow, montane riparian). Special status wildlife species that may be affected by these actions over the long term include western pond turtle, northern harrier, peregrine falcon, bald eagle, harlequin duck, great gray owl, pallid bat, spotted bat, western white-tailed jackrabbit, Sierra Nevada red fox, long-eared owl, yellow warbler, willow flycatcher, Sierra Nevada mountain beaver, and western red bat.

Despite some of these ongoing impacts that would occur under Alternative 1 (No Action), the NPS would also continue restoration projects to mitigate for impacts on biological values. The NPS would also continue invasive species control where such plants are present, as well as conifer removal from some meadows. These ecological management actions would increase habitat integrity by reducing fragmentation and providing connectivity between habitat communities, reduce erosion along riverbanks, enhance habitat quality for terrestrial and aquatic wildlife, and continue to protect water quality. Thus, current ecological management actions under Alternative 1 would enhance biological values, thereby offsetting some of the adverse trends described previously. Overall, these actions would result in long-term, minor, beneficial effects on special status species throughout the Merced River corridor.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 1 (No Action) would perpetuate the kinds and amounts of visitor use that exist today. No new structures would be constructed in the river corridor under Alternative 1 except for minor structures that are small; temporary; easily removed; not habitable; designed to support existing uses, systems, and programs; located within existing building footprints; and not created solely for commercial purposes. Temporary housing for employees would continue as needed. Housing for NPS employees and park partner staff would remain in current locations and at current levels.

Many resource impacts deriving from visitor and administrative use in all segments would continue to be present. Informal trails, bicycle paths, campsites, roads, bridle paths, parking, staging areas, and trails would remain in some sensitive habitat areas, such as meadows and riparian habitat adjacent to or within the 100-year floodplain. Traffic congestion, lack of parking spaces, and improper parking adjacent to or on edges of meadows would continue to affect meadow habitats. Adverse impacts would be mitigated through continuation of current policies, including protection of natural

processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use. Thus, current visitor use and facility management actions under Alternative 1 (No Action) would result in long-term, minor, adverse impacts on special status species throughout the Merced River corridor.

## **Segment 1: Merced River Above Nevada Fall**

### ***Impacts of Actions to Protect and Enhance River Values***

The continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, use of the wilderness trailhead quota system, and restrictions on amounts and locations of overnight use, would protect intact natural habitats within wilderness areas, including the distribution, numbers, population composition, and interaction of special status species. The NPS would continue efforts to monitor use, eliminate inappropriate uses (such as informal trails), and restore affected sites to natural conditions. Overall, habitat for special status species in the Yosemite Wilderness within Segment 1 would remain undisturbed excluding trail corridors, as noted below, and no effect would result.

Special status wildlife habitat adjacent to trail corridors would continue to be affected by ongoing use. Habitat in lightly used alpine areas would remain relatively undisturbed. Impacts in these Wilderness areas would be very minor associated with occasional noise, human presence, and some modification to habitat from vegetation loss and soil compaction along trail corridors. In subalpine areas, site-specific impacts would result from foot and stock traffic along trail corridors. These activities would include disturbances such as noise, human presence, stock presence and impacts to habitat such as vegetation trampling, soil compaction, and manure deposition by pack stock. These actions could affect the reproductive success of some special status bird species within Segment 1, such as northern goshawk and olive-sided flycatcher. If campground and trail use continues at current levels, adverse impacts could occur at scarcer wet-meadow habitats, thereby affecting special status species associated with these habitats, such as Yosemite toad. However, as noted above, the NPS would continue to implement site-specific restoration projects to halt or reverse these adverse effects. Therefore adverse impacts on special status wildlife associated with trail use would be local, minor, and long term.

While no federally listed or state-listed plant species have been documented in Segment 1, three park-designated sensitive plant species occur or have the potential to occur in Segment 1 (California bolandra, Mono Hot Springs evening primrose, and cleft sedge). Currently, all of these species or their habitats are affected by occasional trampling. Impacts from habitat loss and competition for resources also affect these species through nonnative species encroachment. These adverse impacts would continue under Alternative 1 and be local, minor, and long-term.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Although administrative and concessioner stock (horses and mules) is typically contained in corrals and pastures away from the Merced River, special status wildlife would continue to be potentially affected from these uses (for example, by use of these areas by cowbirds). Likewise, the continued use of trails by horses and mules could increase cowbird parasitism, as well as result in runoff from trails;

runoff can affect adjacent aquatic habitats by introducing unnaturally high levels of nutrients. Horse and mule droppings could, furthermore, lead to the introduction of nonnative plant species and cause locally increased populations of insects such as flies. Habitats in the Wilderness reaches of the Merced River are generally intact, except where visitor use is intense (for example, in the vicinity of the Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, Merced Lake High Sierra Camp and Backpackers Campground, and along major trail routes). Under Alternative 1 (No Action), site-specific impacts on suitable habitat for special status wildlife species from foot and stock traffic would continue as under existing conditions. Habitats at these locations would continue to be negatively affected by existing trails and visitor and stock use. Types of adverse effects associated with continued visitor and stock use include potential introduction or spread of noxious weeds (primarily by stock), grazing, trampling, soil compaction and erosion, which could result in a loss of natural habitat structure, diversity, and productivity. Stock and/or visitor use also results in the creation of informal trails in some meadow areas, which causes habitat fragmentation, soil compaction, and potential hydrologic disruption.

The following examples describe general actions and related adverse effects that could occur in the vicinity of facilities and areas of concentrated visitor and stock use under Alternative 1. These effects are generally considered local, long-term, minor, and adverse. In all other areas of the Wilderness reaches of the main stem of the Merced River, continued use of existing facilities (e.g., trails) at a similar level of intensity would have negligible effects on rare, threatened, and endangered species.

- Trampling, grazing, or camping within meadows could have direct effects on habitat for ground-dwelling special status wildlife, including Sierra Nevada mountain beaver.
- Stock use would continue to support the local abundance of brown-headed cowbirds (a nest parasite), to the detriment of species such as willow flycatcher, olive-sided flycatcher, and yellow warbler.
- Continued concentrated visitor use along the north side of the Merced River within Little Yosemite Valley could have site-specific, adverse effects on forest communities located north of the river and may have long-term, adverse effects on habitat for northern goshawk at this location because repeated disturbances near nest trees can result in nest failure or abandonment.

The degree to which rare, threatened, and endangered wildlife species would be affected depends on individual species habitat requirements, their position relative to facilities and use, and their sensitivity to disturbance. Based on these considerations, populations of rare, threatened, and endangered wildlife species that occur in proximity to Merced Lake High Sierra Camp and Backpackers Campground, Little Yosemite Valley Backpackers Campground, Moraine Dome Backpackers Campground, and major trail routes could experience local, long-term, minor, adverse effects.

Based on these factors, adverse impacts associated with Alternative 1 (No Action) on special status species in Segment 1 would be local, long-term, and minor. Special status wildlife species that might be affected by these actions over the long term include Yosemite toad, Mount Lyell salamander, Sierra Nevada yellow-legged frog, northern goshawk, golden eagle, olive-sided flycatcher, yellow warbler, harlequin duck, California spotted owl, pallid bat, Sierra Nevada mountain beaver, spotted bat,

western mastiff bat, Sierra Nevada snowshoe hare, western white-tailed jackrabbit, Mount Lyell shrew, Pacific fisher, and Sierra Nevada red fox.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

The meadow and riparian habitats within Segment 2 are highly productive, structurally diverse habitats that support high diversity of wildlife species. Existing developments, such as roads, bridges, ditches, and campgrounds, would continue to have adverse effects on rare, threatened, and endangered species where these features impose barriers to wildlife movements or alter hydrology. Under Alternative 1 (No Action), meadow size would continue to gradually decrease in some areas within Segment 2 from conifer encroachment and existing alterations to natural meadow hydrology. Riparian zones along the Merced River would continue to be adversely affected by trampling caused by undirected visitor use of the river edge. Heavy use of the riverbank in some areas would continue, causing vegetation trampling and soil compaction, which leads to riverbank erosion, damaged wildlife habitat, and river channel widening. Roads, parking lots, and other impervious surfaces in or near the river corridor could continue to release pollutants into stormwater runoff that could subsequently discharge to low-lying wetlands and the aquatic habitat of the Merced River. As described previously, the NPS would continue to implement site-specific restoration projects to halt or reverse these adverse effects. These impacts would therefore be local, minor, and adverse on special status wildlife in Segment 2 that use meadow and riparian habitats (WHR: montane riparian, wet meadow). Special status species that may be affected by these actions over the long term include western pond turtle, harlequin duck, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, black swift, willow flycatcher, yellow warbler, pallid bat, spotted bat, western red bat, and Pacific fisher.

No federally or state-listed plant species and 27 park-designated sensitive plant species inhabit or have the potential to inhabit Segment 2 (see table 9-99). Most of these species are found in areas with at least seasonally wet. Meadows maintained by high water tables that have been affected by hydrologic alterations might continue to gradually decrease in size as conifers become further established. Existing improvements, such as roads, bridges, ditches, structures, and campgrounds, would continue to indirectly affect meadow vegetation patterns. For example, roads that dissect meadows would continue to affect the hydrologic connectivity of wet meadows. These hydrological alterations would continue to influence meadow plant species composition as soil conditions trend towards drier conditions. This trend would also encourage the invasion of drier areas by nonnative plant species, with a resulting loss of native diversity and productivity. Hydrologic impacts are thus the greatest threat to the survival of most special status plant species in Yosemite Valley. However, ongoing meadow maintenance activities, including the removal of encroaching conifers, would offset some of these adverse impacts. These adverse impacts would continue under Alternative 1 and would be local, long term, and minor.

Currently, all of these species or their habitats experience impacts from occasional trampling. Nonnative species encroachment can result in habitat loss and competition for resources. These adverse impacts would continue under Alternative 1 (No Action) and would be local, long-term, and minor.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

General human-related effects on special status species within Yosemite Valley include trampling, litter, noise, night lighting, erosion, compaction, and unintentional introduction and spread of nonnative plants and wildlife. Visitor use could continue to affect habitat for rare, threatened, and endangered wildlife species in Segment 2 under Alternative 1 by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Modifications to the river channel and floodplain (through soil compaction, loss of riparian vegetation, and accelerated erosion) influence important stream characteristics that may combine to accelerate widening of the Merced River and alter local vegetative patterns. Trampling and visitor use could continue to adversely affect understory vegetation, introduce and spread nonnative species, and impede natural regeneration of native oaks, woody shrubs, and riparian and meadow vegetation. These impacts would be local, long term, minor, and adverse.

The following examples describe general actions and related effects that could occur to rare, threatened, and endangered species within the Valley:

- Trampling of meadows (such as at El Capitan Meadow) could have direct effects on habitat for ground-dwelling wildlife species.
- Continued high visitor use and continuation of the stables within the Valley would promote brown-headed cowbirds to the detriment of species such as yellow warbler.
- Riparian-dependent species would continue to be adversely affected by the overall amount of noise, traffic, and human presence at facilities such as North and Lower Pines campgrounds and Camp 6.
- Continued expansion of coniferous forests throughout the Valley could adversely affect wildlife species that depend more heavily on meadow and oak woodland habitats.
- Continued nonnative predation, fragmentation of aquatic and floodplain habitats, use of nonmotorized watercraft, swimming, and fishing may adversely affect western pond turtles.
- Increased human presence and human-related effects associated with the use of facilities (such as night lighting, reduction of habitat, noise, and erosion) would likely result in long-term, adverse effects on owls (e.g., great horned owl) within the Valley.
- Implementation of Alternative 1 could negatively affect the success of recolonization of species, such as willow flycatcher, now extirpated from the Valley.

Under Alternative 1 (No Action), the NPS would continue to implement existing goals and policies (e.g., the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*, the GMP, *Invasive Plant Management Plan*) and make incremental improvements on an ad-hoc basis as opportunities and resource problems present themselves. For example, oak

woodlands hampered by existing development and infrastructure, and these woodlands enhancement and reestablishment of would continue on a site-by-site rather than a Valleywide basis. Although substantial improvements can take place under current direction and implementation, “reactive” resource management is not always effective at protecting sensitive resources over the long term.

In general, when combined with existing habitat management programs, the ongoing adverse effects on habitat combined with continued visitor use and the foreseeable increase in visitors under Alternative 1 would result in local, long-term, minor, adverse effects on rare, threatened, and endangered species within Segment 2.

Based on these factors, adverse impacts on special status species in Segment 2 associated with Alternative 1 (No Action) would be local, long term, and minor on those species in Segment 2. Special status wildlife species that may be affected by these actions over the long term include Mount Lyell salamander, western pond turtle, harlequin duck, golden eagle, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, Vaux’s swift, black swift, olive-sided flycatcher, willow flycatcher, yellow warbler, pallid bat, Townsend’s big-eared bat, spotted bat, western red bat, western mastiff bat, and Pacific fisher.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Direct human intrusion into the majority of riparian and riverine areas of the Merced River gorge (Segment 3) is minimal because of the topography. In some areas under Alternative 1 (No Action), the riparian zone would continue to be affected by improvements, including roads and turnouts, as well as contaminated stormwater runoff, nonnative species, use of nonmotorized watercraft (and associated visitor trampling at launch and removal locations), and riprap. Roads, parking lots, and other impervious surfaces in or near the river corridor would continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to Merced River aquatic habitats. These ongoing adverse impacts on special status wildlife would be local, long-term, and negligible in Segments 3 and 4.

Two federally or state-listed plant species (which are also park designated) and five additional park-designated sensitive plant species occur or have the potential to occur in Segments 3 and 4 (Thompkins’ sedge, narrow leaf collinsia, Congdon’s woolly sunflower, Congdon’s lewisia, northern bugleweed, valley oak, and Sierra bladder nut). Currently, all of these species or their habitats experience impacts from occasional trampling. Impacts from habitat loss and competition for resources occur to these species from nonnative species encroachment. These adverse impacts on special status plants would continue under Alternative 1 and are considered to be local, long term, and minor.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Continued concentrated visitor use and management policies under Alternative 1 (No Action) would have local, negligible, adverse effects on oak communities and the rare, threatened, and endangered

species that use them in Segment 4. In all other areas of the Merced River gorge, human-related effects on rare, threatened, and endangered species and their habitats are expected to be negligible.

The following examples describe general actions and related adverse effects that could affect rare, threatened, and endangered species within Segment 4

- Use of the El Portal Road (and associated pollutant discharges), presence of nonnative species, and trampling (e.g., at river access sites for visitors) could have adverse effects on special status species, such as valley elderberry longhorn beetle.
- Noise and lighting associated with vehicle traffic and developed areas could adversely affect nesting habitat for California spotted owl over the long term.

In general, the ongoing effect on suitable habitat combined with continued visitor use would result in local, long-term (depending on specific effects on particular species), minor, adverse effects on rare, threatened, and endangered species within Segments 3 and 4.

Based on these actions and effects, adverse impacts on special status species in Segments 3 and 4 associated with Alternative 1 would be local, long term, and minor. Special status wildlife species that may be affected by these actions over the long term include valley elderberry longhorn beetle, hardhead, golden eagle, long-eared owl, yellow warbler, bald eagle, harlequin duck, pallid bat, and Townsend's big-eared bat.

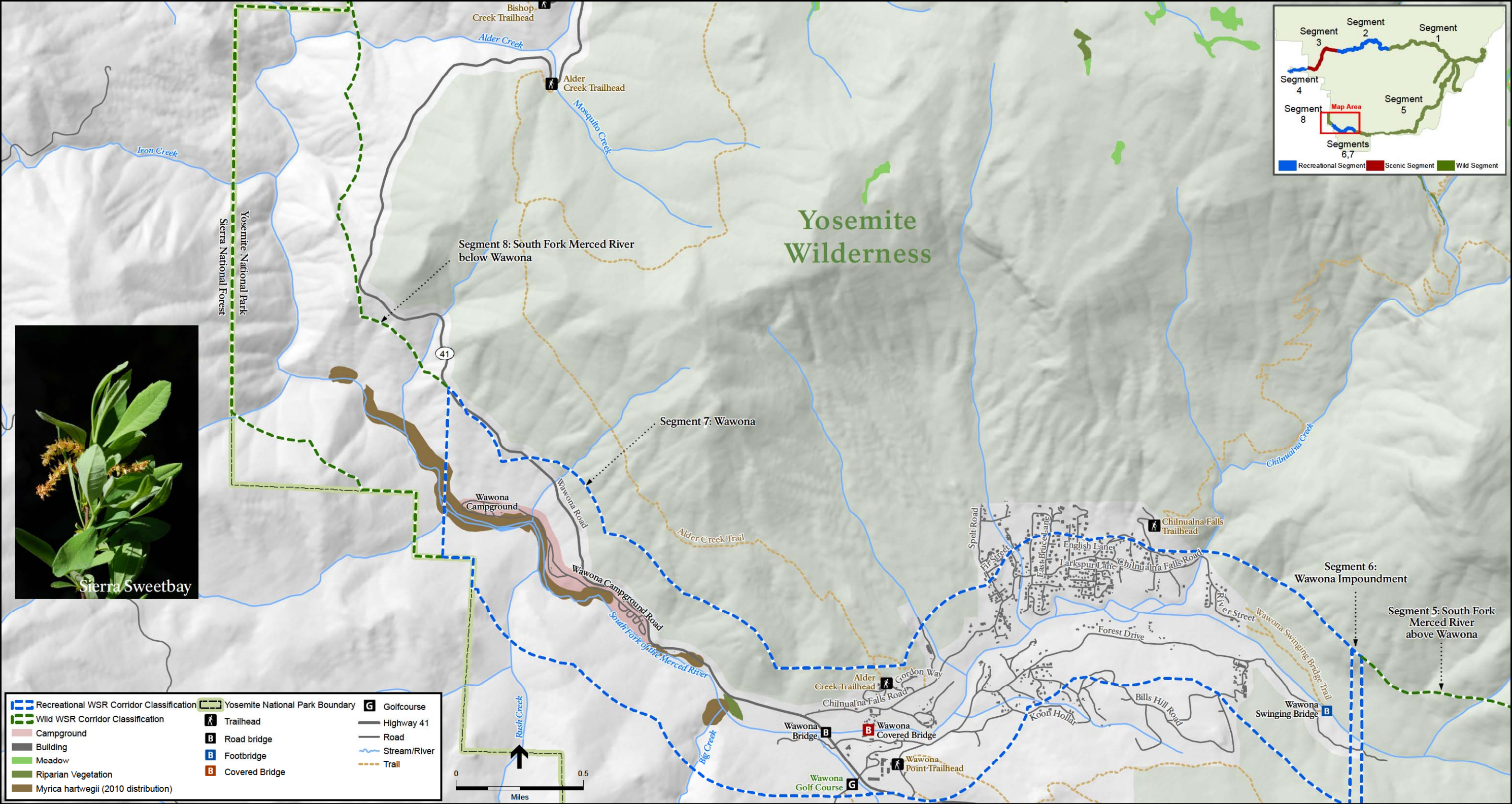
## Segments 5– 8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 1 (No Action), continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use, would protect intact natural habitats, including the distribution, numbers, population composition, and interaction of special status species. In general, adverse impacts on special status species in Segments 5– 8 under Alternative 1 would be local, long term, and minor.

Of particular concern along Segments 7 and 8 is Sierra sweet bay (*Myrica hartwegii*), a regionally rare species in the Wawona area, which contributes to the outstandingly remarkable values (ORVs) in these segments (**figure 9-37**). Surveys of Sierra sweet bay in the vicinity of the Wawona Campground revealed a low level of adverse effect from human impact. The most frequent and ongoing impact is foot traffic, as informal trails are worn through its habitat along the river, and sandbars attract distributed foot traffic. These continued adverse impacts on Sierra sweet bay in the Wawona area under Alternative 1 would be local, long term, and minor.





SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436  
**Figure 9-37**  
Segments 7 and 8: Sierra Sweet Bay Distribution

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Habitats along the South Fork (Segment 7)—including meadow, riparian, scrub, chaparral, and coniferous and deciduous forests—comprise a wide range of terrestrial wildlife habitats. A survey in 1998 found willow flycatcher in Segment 7, but breeding by this species along this segment has not been confirmed since. The presence of willow flycatcher is indicative of an intact meadow-riparian complex.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

No developments (other than a few trails) currently are in the upper and lower portions of the South Fork Merced River (Segments 5 and 8). Access is difficult, and visitor and stock use is low. Rare, threatened, and endangered species of plants and wildlife reported in the South Fork Merced River corridor generally occur in Wilderness portions of the corridor or relatively inaccessible habitats. The anticipated increase in overall visitors to the park also may increase pressure on relatively unused portions of the South Fork Merced River in the Wawona vicinity. Although any increases in visitor use of the upper and lower reaches of the South Fork Merced River under Alternative 1 (No Action) could adversely affect habitats, these effects would be minor because topography would continue to limit the majority of visitors that can access Segments 5 and 8.

Under Alternative 1, wildlife habitats within Segments 6 and 7 would continue to be affected by existing developments and visitor use. Potential effects on habitats that may be used by rare, threatened, and endangered wildlife species include conifer encroachment, visitor trampling, spread of nonnative species, continued use of existing development, and loss of natural drainage patterns caused by roads and hydrologic alterations. Visitor use would continue to affect some habitats of Segment 7 by compacting soils, reducing vegetative cover, altering streambanks, and inducing erosion. Roads, parking lots, and other impervious surfaces in or near the river corridor would continue to release nonpoint-source pollutants into stormwater runoff that could subsequently discharge to low-lying wetlands and the South Fork Merced River aquatic habitat. These effects would be local, long term, minor, and adverse.

While no federally listed or state-listed plants have been documented in Segment 7, 11 park-designated sensitive plant species occur or have the potential to occur in Segment 7 (spurred snapdragon, Lemmon's wild ginger, slivery sedge, Bolander's woodreed, narrow leaf collinsia, California sunflower, yellow and white monkeyflower, Sierra sweet bay, Sierra skullcap, Clark's ragwort, narrowpetal wakerobin, California red huckleberry, and Hall's mule ears). Currently, occasional trampling affects all of these species or their habitats. Impacts from habitat loss and competition for resources affect these species from non-native species encroachment. These adverse impacts would continue under Alternative 1 and would be local, long term, and minor.

Based on these actions, adverse impacts on special status species in Segments 5–8 associated with Alternative 1 (No Action) would be local, long term, and minor. Special status wildlife species that may be affected by these actions over the long term include Yosemite toad, Mount Lyell salamander, Sierra Nevada yellow-legged frog, northern goshawk, golden eagle, long-eared owl, Vaux's swift, northern harrier, olive-sided flycatcher, yellow warbler, willow flycatcher, bald eagle, harlequin duck, great gray owl, California spotted owl, pallid bat, Sierra Nevada mountain beaver, Townsend's big-eared bat,

spotted bat, western mastiff bat, Sierra Nevada showshoe hare, western white-tailed jackrabbit, Pacific fisher, Sierra Nevada red fox, and American badger.

### **Summary of Alternative 1 (No Action) Impacts**

Development and visitor activity in the South Fork Merced River corridor has affected rare, threatened, and endangered species. Implementation of Alternative 1 (No Action) would continue to alter natural habitat and ecosystem patterns that in turn may directly or indirectly affect some rare, threatened, and endangered species. The NPS would continue to implement existing goals and policies (for example, the 1916 Organic Act, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*, *General Management Plan*, and *Invasive Plant Management Plan*) and make incremental improvements on an ad-hoc basis, as opportunities and resource problems present themselves. Furthermore, the NPS would continue to implement the provisions of the federal ESA and other management policies that are directed toward the protection and recovery of rare, threatened, and endangered species.

Overall, effects on rare, threatened, and endangered species would be considered local, long term, minor, and adverse under Alternative 1 (No Action). Adverse effects would continue in some instances as visitor use increases and natural ecosystem patterns are not restored in a more comprehensive manner. These adverse effects would be concentrated in areas of heavy visitor use, such as Yosemite Valley in Segment 2. In areas of little use (e.g., a majority of the upper main stem of the Merced River [Segment 1] and the upper and lower portions of the South Fork Merced River [Segments 5–8]), continued use of existing facilities (such as trails) at a similar level of intensity would have a negligible effect on rare, threatened, and endangered species. Therefore, overall implementation of Alternative 1 would have long-term, minor, adverse effect on rare, threatened, and endangered species. Therefore, Alternative 1 may affect, but is not likely to adversely affect, special status species in the Merced River corridor, including federally listed and candidate species such as valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

### **Cumulative Impacts of Alternative 1 (No Action)**

Cumulative effects on rare, threatened, and endangered species discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region. The intensity of impact depends on whether the impacts are anticipated to interact cumulatively. For example, factors external to the park, such as broad regional habitat loss and pesticide use, can combine with existing, in-park impacts, such as from nonnative species, to cause declines in rare, threatened, or endangered amphibians (such as Sierra Nevada yellow-legged frog and Yosemite toad), which would be an adverse, cumulative impact. The projects identified below are those that have the potential to affect populations of rare, threatened, or endangered species (i.e., within the Merced River corridor) as well as large-scale or regional populations of the same species.

### ***Past Actions***

Natural habitats in Yosemite have been manipulated almost since the beginning of the park. Regional wildlife and vegetation patterns have been historically affected by logging, fire suppression, rangeland



clearing, grazing, mining, draining, damming, diversions, and the introduction of nonnative species. Mammal species that survive but are extremely rare are the Pacific fisher and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by visitor activity but are present in less disturbed areas of the park. Willow flycatchers no longer nest in the Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. Amphibians in Yosemite have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellers 1996). Red-legged frogs likely were found in the Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, Sierra Nevada yellow-legged frogs and Yosemite toads are still present in a number of areas but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; known and possible causes include habitat destruction, nonnative fish, pesticides, and diseases. Past and ongoing activities that affect rare, threatened, or endangered species include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

In 1991, the USFS and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the main stem Merced River and South Fork Merced River that are under their jurisdiction; this plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for nonmotorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Past projects and plans that could have a cumulative effect on special status species in the Merced River Wild and Scenic corridor include the following:

***Management and Restoration*** – *South Fork and Merced Wild and Scenic River Implementation Plan*, Cascades Diversion Dam Removal, Cook's Meadow Ecological Restoration, Fern Springs Restoration, Happy Isles Dam Removal, Happy Isles Fen Habitat Restoration Project, Happy Isles Gauging Station Bridge Removal, Merced River Ecological Restoration at Eagle Creek Project

### ***Present Actions***

Current facility-related projects and plans that could have a cumulative effect on special status species include the following:

***Facility Development*** – Crane Flat Utilities, *East Yosemite Valley Utilities Improvement Plan/Environmental Assessment*, Wauhoga Indian Cultural Center, Parkwide Communication Data Network, South Entrance Station Kiosk Replacement, Tioga Road Rehabilitation

Beneficial impacts of present management and restoration actions are similar to those discussed for past actions. Specific examples of present projects and plans with beneficial effects include the following:

***Management and Restoration*** – *Yosemite Vegetation Management Plan*, General Ecological Restoration, 2004 *Fire Management Plan/EIS*, Fuels reductions/forest rehabilitation projects (USFS), *Tuolumne Wild and Scenic River Comprehensive Management Plan*

### ***Reasonably Foreseeable Future Actions***

Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on regional special status species include:

- Changing demographics of visitors in Yosemite
- Climate change
- Concessioner Parking Lot Restoration
- Restoration of the Mariposa Grove Ecosystem
- *Yosemite Wilderness Stewardship Plan/EIS*

Planned restoration projects listed above would generally contribute towards beneficial cumulative effects to special status species by increasing the quantity and quality of affected habitats. Cumulative adverse effects are related to increased facilities, access, and regional population growth as well as changes in climate. Facility-related projects would in many cases have local, adverse effects on rare, threatened, and endangered species due to construction activities (short term) and the direct loss of habitat (long term). Increased population and visitation to the region to the over time would also contribute towards adverse effects. Regional population growth and visitation primarily affects regional rare, threatened, and endangered species through habitat loss and fragmentation due to new housing and infrastructure and use. Examples of construction- and human-use-related effects on rare, threatened, and endangered species include direct displacement of rare, threatened, and endangered species (e.g., nest trees removed and replaced with structures), introduction of nonnative species that invade into adjacent natural areas and displace native species (e.g., the spread of yellow star thistle by construction equipment and its subsequent adverse impacts on special status plant species), fragmentation of habitats, alteration of natural patterns (e.g., the introduction of night light), and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). In total, regional development and growth could have a net long-term, moderate to major (depending on species-specific impacts), adverse effect on regional rare, threatened, and endangered species that would not be compensated by regional planning and restoration projects discussed above.

Changes in climate also pose a threat to several special status species, including American pika, yellow-legged frog and bighorn sheep. These species, as well as a variety of amphibians and plants, would be affected by warming temperatures through transitions in vegetation communities, changes in snow pack and runoff, and increasing competition from other species (including invasives) as habitat for competitors becomes more suitable over time.

Although past, current and proposed restoration actions would have a long-term, beneficial cumulative effect on rare, threatened, and endangered species within the Merced River corridor, throughout the Sierra Nevada and larger region, past, present, and reasonably foreseeable future actions related to increase regional growth (construction and human-use-related effects) and climate change would have long-term, moderate to major (depending on species-specific impacts), adverse cumulative impacts on regional rare, threatened, and endangered species. While these affects would be lessened by restoration projects, they would not fully compensate the adverse effects discussed above. These cumulative actions

in combination with Alternative 1 (No Action) would therefore have a net long-term, minor, adverse effect on regional rare, threatened, and endangered species.

## ***Environmental Consequences of Actions Common to Alternatives 2–6***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** The following discussion provides an overview of the types of impacts to special status species that would be common to all segments under all action alternatives. All action alternatives include general programmatic restorative management actions that would occur across all segments of the Merced River Corridor. Program level actions include the removal of underground infrastructure, removal of riprap, and the management of large wood. In order to improve the hydrologic function and restore ecological integrity, the NPS would remove abandoned underground infrastructure throughout the corridor. This infrastructure currently contributes to dewatering of meadows and wetlands, and alteration of the natural hydrologic regime of the Merced River. Removal of these facilities would have a long-term, moderate, beneficial impact on meadow, riparian, and wetland habitats. The park would implement bioengineered riverbank stabilization techniques and selective large woody debris management as appropriate to support riverbank stabilization and improve aquatic habitat complexity. All areas from which infrastructure and riprap are removed would be returned to natural conditions, including revegetating with appropriate native plants. Removal of this infrastructure and riprap would result in a local, moderate, long-term beneficial impacts on special status plant and animal species that occur in aquatic and riparian habitats.

Program level actions include the protection of the riparian zone from new development within 150 feet of the ordinary high water mark and the removal of campsites from within 100 feet of the ordinary high-water mark. The park would undertake certain measures to address ongoing habitat impacts, including those resulting from unauthorized river access points, informal trails, and conifer encroachment into meadow areas, through various restoration techniques, fencing and area closures, and visitor education and visual cues. Toward that end, the park would utilize brochures, maps, signage, and improved trail delineation techniques to direct visitors away from sensitive areas. These programmatic restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. Removing abandoned underground infrastructure, restoring informal trails, removing conifers from meadows, directing visitor use, removing riprap, and restoring free-flowing conditions along the Merced River corridor would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian habitats. Thus, these programmatic management measures would be expected to have a long-term, moderate, beneficial impact on special status species associated with the Merced River corridor.

Special status wildlife and their habitats may be adversely affected in the short term by the above management actions as a result of construction/removal, restoration, and monitoring activities. Potential impacts include disturbance associated with noise from construction/restoration activities,



human presence, and modification to habitat. These activities could cause wildlife to relocate or avoid the area and cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird, and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, over time the actions would have long-term, moderate, beneficial impacts on special status wildlife species that use Merced River corridor habitats.

Vegetation that would need to be removed for restoration actions under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor. These impacts would be local and occur within or adjacent to the river corridor. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Special status plant populations would be avoided by management activities.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur across all segments under Alternatives 2-6 include removing 3,400 feet of riprap from the river bank and revegetating with riparian species, and replacing an additional 2,300 feet of riprap with bioengineered riverbank stabilization devices. Riprap placed along the banks of the Merced River inhibits the establishment of riparian vegetation. The removal of riprap and subsequent restoration of riparian habitat would result in a local, long-term, moderate, beneficial impact on native riparian plant communities.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

There would be no actions to manage visitor use and facilities applicable to Segments 1–8 under Alternatives 2–6.

#### **Segment 1: Merced River Above Nevada Fall**

#### *Impacts of Actions to Protect and Enhance River Values*

Restorative management projects that would occur within Segment 1 under Alternatives 2–6 would include measures to reduce impacts on special status species or sensitive habitats. Under Alternatives 2–6, trails in Segment 1 would either rerouted out of sensitive habitats. New trail routes would avoid wetlands and special status species habitats. Under Alternatives 2–6, the park would relocate sections of trail through wetlands in Echo Valley and a mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. The trail along wet sections of the Mist Trail would be hardened to avoid trail widening. Formal trails through meadows along the Triple Creek Fork cause extensive rutting and headcutting; under Alternatives 2–6, these trails would be rerouted to

upland habitats where possible. Informal trails in the Merced Lake Shore Meadow, adjacent to the Merced Lake High Sierra Camp, fragment meadow plant communities, stunt vegetation lining the lakeshore, interrupt meadow hydrology, and compact soils. Under Alternatives 2–6, the park would decompact soils along informal trails at the Merced Lake Shore Meadow, fill ruts with native soils, and revegetate denuded areas with native plants.

These management actions could result in local, short-term, adverse impacts on special status wildlife from noise associated with restoration activities, human presence, and potential sedimentation of adjacent aquatic habitats. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, over time the actions would have long-term, moderate, beneficial impacts on species of special status wildlife that use high-elevation meadow habitats (WHR type: wet meadow). Special status wildlife species that may benefit from these actions over the long term include Yosemite toad, northern goshawk, peregrine falcon, pallid bat, spotted bat, Mount Lyell shrew, western white-tailed jackrabbit, and Sierra Nevada red fox.

Special status plants may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with these management actions. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, restorative management actions proposed under Alternatives 2-6 would result in a local, long-term, minor, beneficial impact on special status plant species associated with meadow habitats in Segment 1.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions to manage visitor use and facilities applicable to Segment 1 would differ under Alternatives 2–6 and are discussed under each alternative subsection.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values that would occur in Yosemite Valley under Alternatives 2-6 involve removal of abandoned infrastructure and other development affecting the Merced River's hydrologic function, extensive meadow restoration, and management of high visitor-use areas to address associated impacts on riparian habitats. The park would also restore six miles of informal trails in Yosemite Valley meadows. Removal of abandoned or obsolete infrastructures would reduce ongoing impacts on meadow hydrology and lessen channel scour. Upland restoration activities, including removal of informal trails, roadbeds, and parking areas, would improve meadow health.

Programmatic restorative management actions to improve the free-flowing condition of the river that would occur within Segment 2 under Alternatives 2–6 include in-channel improvements, such as

strategically placing large wood (logjams) to lessen the scouring from bridge structures. In the river reach upstream of the El Capitan moraine to the Sentinel picnic area, local restoration would enhance channel complexity. Water quality would be improved by relocating the Upper Pines dump station. These actions would result in enhanced channel free flow, increased channel complexity, reestablish riparian habitat, increased streambank stability, and improved habitat for special status species associated with the aquatic habitats of the Merced River. Short-term, adverse impacts resulting from construction and implementation of these actions would be local, adverse and minor due to a potential increase in suspended sediments resulting from in-water restoration activities and disturbance from noise and human activities. However, overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Segment 2 aquatic and riparian habitats, resulting in beneficial effects to special status species that use the aquatic environments of the Merced River.

High visitor use along sensitive riverbanks of channels in Yosemite Valley is causing vegetation trampling and soil compaction, resulting in riparian vegetation loss, riverbank erosion, and decreased soil infiltration. In some areas, trees are getting undercut as a result of trampling around the base of the tree, leading to potential channel widening. Under Alternatives 2–6, visitors accessing the river in Segment 2 would be redirected to resilient sandbar points and sandy beaches through signs, campground maps, and brochures. Specific river access points would be designated. Parking would be relocated to more suitable areas. Picnic areas would be delineated by fencing, and river terraces would be revegetated with native riparian species. Vulnerable steep slopes and riparian habitats would be fenced off to prevent further bank erosion. Some infrastructure (toilets, parking, and picnic tables) within the 10-year floodplain would be removed. The proposed redirection of visitor uses to resilient areas away from unstable slopes and sensitive locations along riverbanks, and the associated restoration of eroded and denuded areas, would generally have a local, long-term, beneficial effect on special status species.

As summarized in the “Wildlife” section of this chapter, a base amount of 151 acres of meadow, riparian, woodland, and forest habitats would be restored in Segment 2 under Alternatives 2–6, resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these management actions would have long-term, moderate, beneficial impacts on species of special status wildlife that use the Merced River and adjacent meadows and riparian habitats in the Valley (WHR types: riverine, wet meadow, montane riparian). Special status wildlife species that may benefit from these actions over the long term include western pond turtle, harlequin duck, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, black swift, willow flycatcher, yellow warbler, pallid bat, spotted bat, western red bat, and Pacific fisher.

Some of the specific actions that could adversely affect special status species in Segment 2 under Alternatives 2–6 include filling ditches using heavy equipment, removing encroaching conifers, relocating and/or elevating trails onto boardwalks, revegetating with willows and other native species, removing abandoned infrastructure, removing and restoring informal trails and parking areas, decompacting soils, and improving road crossings in meadows. While these actions would ultimately be a beneficial impact, construction activities associated with these actions (e.g., mechanical decompaction of soil) could have short-term, minor, adverse impacts on special status species. Removing abandoned infrastructure, decompacting soils in former parking areas or roads, removing encroaching conifers, preparing areas for revegetation, constructing improvements at road crossings, and rerouting trails could involve the use of heavy equipment, which could disturb special status

species. Using fire to keep meadows open and ecologically productive could temporarily disturb special status species. However, overall these measures would also improve the hydrologic function and restore the ecological integrity of Yosemite Valley meadows, resulting in beneficial effects in special status species in Segment 2.

Actions also include improving the condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions would enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.

Special status wildlife and their habitats in Segment 2 may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with these management actions. Potential impacts include disturbance associated with noise from construction/restoration activities, human presence, discharge of sediments, and modification to habitat. The use of heavy equipment would create the potential for wildlife injuries or death. These activities could cause wildlife to relocate or avoid the area and cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations, in particular, in Segment 2. With the implementation of mitigation measures such as surveying potential habitat prior to construction (see mitigation measure MM-WL-1 through MM-WL-7, as applicable; see Appendix C), (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided.

Special status plant species would be avoided during management activities. Vegetation that is removed under actions that are common to Alternatives 2–6 would not substantially fragment existing native plant communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor in Segment 2. These impacts would be local and occur within or adjacent to the Merced River corridor. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, these measures would improve the hydrologic function and restore the ecological integrity of Yosemite Valley meadows. Associated beneficial impacts would include reduced fragmentation and disturbance of meadows, increased opportunities for revegetation and restoration, and enhanced hydrological connectivity between the meadows and the Merced River. Thus, these management actions would be expected to have a local, long-term, moderate, beneficial impact on special status plant species occurring within Segment 2.

### **Biological Resource Actions.**

***Ahwahnee Meadow:*** Actions common to Alternatives 2-6 to protect and enhance river values at the Ahwahnee Meadow include restoring an impacted portion of the Ahwahnee Meadow to natural meadow conditions and removing the tennis courts from black oak woodland. Currently disjunct portions of Ahwahnee Meadow would be reconnected by selectively removing conifers to return approximately 5.65 acres of meadow habitat. Enhancing meadow connectivity would reduce meadow fragmentation and removal of the tennis courts from black oak woodland would allow for woodland

habitat to be restored. Natural meadow topography would be restored by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow species. Actions to restore Ahwahnee Meadow would have local, long-term, moderate, and beneficial impacts on special status species due to an increased amount of meadow and oak woodland habitat, a reduction in habitat fragmentation, and enhanced habitat function (restored topography and hydrological connectivity). Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Yosemite Valley Campgrounds:*** Common to Alternatives 2-6, the NPS would remove all campsites within 100' of the bed and banks of the Merced River in all Valley campgrounds and restore riparian habitat through the removal of asphalt parking spaces, base rock, and fill material. Soils would be decompacted and topography would be recontoured to natural conditions. Native riparian plant species would be used to revegetate denuded areas. Riparian habitat protection would be achieved through redirecting visitors to more stable and resilient areas, and installation of new fencing (or adjusting existing fencing) to protect newly restored riparian zones. Restoration of the 100' buffer of floodplain and riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, and beneficial impacts to special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

***El Capitan Meadow:*** Common to Alternatives 2-6, the NPS would reroute the climber use trail at El Capitan to an appropriate upland area east of the current location to reduce impacts to El Capitan Meadow. Additionally, informal trails through meadow and oak woodland habitat would be removed and fencing or natural barriers and signs would be installed to keep visitors from trampling on native plants. Existing culverts would be replaced and additional culverts would be installed to improve water flow from at El Capitan to Northside Drive. Encroaching conifer saplings would be removed from El Capitan Meadow. Restoration of El Capitan Meadow would result in local, long-term, minor, and beneficial impacts on special status species from reduction in trampling from foot traffic, increased hydrological connectivity, and reduced conifer encroachment into meadow habitat. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

Additional actions common to Alternatives 2-6 in Yosemite Valley include: formalizing parking and river access from the Pohono Bridge to the Diversion Dam; adding 150' of boardwalk to the west of the existing boardwalk at Sentinel Meadow; expanding fenced areas to protect wetlands on the north end of Stoneman Meadow near Lower Pines Campground; restoring 20 acres of floodplains at the western portion of former Lower Pines Campground; removal of infrastructure and restoration of an additional 30 acres at the Former Upper and Lower Pines campgrounds; removing roadside parking along Sentinel Drive and restoring to natural conditions; relocating parking from Devil's elbow to the east of the current parking lot and delineating a formal trail to access the sandbar; focusing visitor use and river access at Housekeeping Camp to two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge; designating formal river access at Cathedral Beach Picnic Area and restoring riparian habitat; and filling approximately 2,155 feet of ditches throughout Valley meadows that are currently not serving current operational needs. Over time these management actions would have long-term, moderate, beneficial impacts on special status species occurring within Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river’s hydrologic and geologic values that would occur within Segment 2 under Alternatives 2-6 include: removing the abandoned gauging station at Pohono Bridge, removing the footings and former river gauge base at Happy Isles, and restoring these areas to natural conditions. In addition engineered log jams (ELJs) would be constructed in the channel between Clark’s and Sentinel Bridges to address river widening and low channel complexity. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segment. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats. Thus, this management action would be expected to have a segmentwide, long-term, moderate, beneficial impact on special status species occurring within Segment 2.

**Cultural Resource Actions.** Specific actions to enhance cultural resources in Segment 2 and common to Alternatives 2-6 include removing campsite 208 and bear box from the East Valley Campground. Additionally, bathroom foot traffic at this campground would be rerouted away from the milling feature and the feature would be protected by fencing. The removal of campsite 208 and rerouting of foot traffic would have long-term, local, negligible, and beneficial impacts on special status species.

**Scenic Resource Actions.** Specific projects to protect and enhance the river’s scenic values that would occur within Segment 2 under Alternatives 2-6 include: selectively thinning conifers and other vegetation in the vicinities of The Ahwahnee and Meadow, Bridal Veil Falls and West Valley, Cooks and Sentinel Meadows, Curry Village, El Capitan, Housekeeping Camp, Yosemite Lodge, and other areas of the Valley; restoring grassland and oak habitat in the areas of Bridalveil Straight; repairing riverbank erosion at Clark’s Bridge; and addressing informal trails and trampling at the east end of El Capitan Meadow. The trees to be removed are summarized in **table 9-101**. The estimated number of trees removed is organized by species and size as they are in 2012. Trees less than 6 inches diameter at breast height (DBH) can be removed in order to maintain a vista without additional compliance, and are not included in the estimates.

**TABLE 9-101: MAXIMUM NUMBER OF TREES REMOVED UNDER ALTERNATIVES 2–6 IN SEGMENT 2**

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Black Oak	1	1	5	0	0	0	0	<b>7</b>
Cedar	794	476	234	147	36	2	1	<b>1,690</b>
Douglas Fir	1	6	1	0	3	0	0	<b>11</b>
Dogwood	1	0	0	0	0	0	0	<b>1</b>
White Fir	49	33	34	15	5	1	0	<b>137</b>
Live Oak	7	3	0	0	0	0	0	<b>10</b>
Ponderosa	355	277	443	386	94	9	3	<b>1,567</b>
Red Fir	0	0	0	0	0	0	0	<b>0</b>
<b>Total</b>	<b>1,208</b>	<b>796</b>	<b>717</b>	<b>548</b>	<b>138</b>	<b>12</b>	<b>4</b>	<b>3,423</b>

As discussed in the “Wildlife” section, the removal of trees less than 20 inches DBH would have a minor to negligible effect upon special status species, as many species of special status wildlife, including special status mammals, birds, and bats, primarily occur in habitats that contain larger, more mature trees (sometimes with suitable cavities). However, removal of trees measuring more than 30 inches in DBH would have a detrimental effect to these species, especially where they are removed near larger polygons of intact, late seral stage mixed conifer habitat. As discussed in the “Wildlife” section, based upon current plans, all trees proposed for removal are located near or adjacent to areas that receive a moderate to high level of human use, are near habitat edges, and/or adjacent to existing improvements such as roadways. Therefore, these actions would result in long-term, local, minor to moderate, adverse impacts on special status wildlife, especially species that inhabit mature forest habitats.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Actions to manage visitor use and facilities within Segment 2 that would occur under each action alternative involve changes to campsites, visitor and administrative facilities, employee housing, and transportation. Under each action alternative, the park would remove or repurpose several visitor-serving facilities, such as the Curry Village Ice Rink; Happy Isles Snack Stand; Yosemite Village Store; Yosemite Lodge Post Office, Pool, and Snack Stand; and Bank Building. The park would also construct new campsites and remove campsites from the rockfall hazard zone. Concessioner employee housing within Yosemite Valley would be affected through the removal of temporary units at the Yosemite Lodge, Highland Court, Huff House, and Boys Town. New housing developments would be constructed at Huff House. Each action alternative includes actions to improve pedestrian wayfinding and access. The park would also undertake a number of transportation and parking management measures; remediation, redesign, and expansion of existing parking areas; and construction of new parking lots in other areas. While a general reduction in focused visitor use at areas near special status species or their habitats would result in a reduction of ongoing minor, adverse impacts from disturbance, trampling, and erosion, construction, removal, relocating facilities to new areas may affect suitable habitat special status species. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Construction of new facilities would have the same effects, as well as a long-term, adverse effect associated with an increase in human presence.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New parking areas and paths under Alternatives 2–6 in Segment 2 may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife



would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Vegetation removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in riparian habitats in Segment 2.

**Camp 6 & Yosemite Village.** Actions in the Camp 6 and Yosemite Village areas that are common to Alternatives 2-6 include the relocation of visitor vehicle services and concessioner general office functions to other buildings and the removal of the existing garage structure and concessioner general office; and transportation actions that formalize parking and public movement in the Camp 6 and Village Sport Shop area.

Construction activities associated with removing the existing garage structure and concessioner general office, as well as actions to formalize parking and public movement in the Camp 6 and Village Sport Shop area could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts from these actions would occur in ponderosa pine forest and montane riparian habitat types. Special status species that could potentially be affected by actions within these habitat types are presented in **table 9-102**.

Construction of new facilities will require some tree removal. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for special status bird species would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

**TABLE 9-102: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVES 2-6<sup>1</sup>**

Scientific Name Common Name	WHR Habitat Type Impacted	Impact Summary
<b>Birds</b>		
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Chaetura vauxi</i> Vaux's swift	Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Contopus cooperi</i> Olive-sided flycatcher	Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Setophaga petechia</i> Yellow warbler	Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>		
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine Montane Riparian	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in the Camp 6 and Yosemite Village areas.
SOURCE: NPS 2012c		

It is unlikely that any special status plant species occur in the Camp 6 and Yosemite Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Camp 6 and Yosemite Village area (Colwell and Taylor 2011b). Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Camp 6 and Yosemite Village under actions common to Alternatives 2-6.

**Yosemite Lodge & Camp 4.** Actions in the Yosemite Lodge and Camp 4 areas that are common to Alternatives 2-6 include the removal of temporary employee housing and the reconstruction of new housing. Under all alternatives, the NPS Volunteer Office (former Wellness Center), post office, swimming pool, and snack stand would all be removed, and the convenience shop and nature shop would be re-purposed.

Construction and removal activities at Yosemite Lodge and Camp 4 could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of developed areas, impacts from these actions occur entirely in ponderosa pine forest habitat type. Special status species that could potentially be affected by actions within this habitat type is presented in **table 9-103**.

For the same reasons discussed above for the Camp 6 and Yosemite Village areas, actions common to Alternatives 2-6 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to special status wildlife species.

It is unlikely that any special status plant species occur in the Yosemite Lodge and Camp 4 area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Yosemite Lodge and Camp 4 p area (Colwell and Taylor 2011b). Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Yosemite Lodge and Camp 4 under actions common to Alternatives 2-6.

Segments 3 and 4: Merced Gorge and El Portal

### ***Impacts of Actions to Protect and Enhance River Values***

To protect and enhance river values within the Merced River gorge and El Portal, the Park would remove informal trails, nonessential roads, fill materials, and abandoned infrastructure throughout Segments 3 and 4. The Odger's fuel storage facility would be removed and the area restored. It would also develop best management practices for revetment construction and repair throughout the Merced River corridor. Valley oaks would be protected in El Portal through best management practices related to invasive species removal, overwatering, tree pruning, and protecting the ground surface within the dripline of oaks (mitigation measures MM-GEO-1 and MM-VEG-2, as applicable; see Appendix C). These restorative actions could result in local, short-term, negligible adverse impacts on special status wildlife within the adjacent riparian habitat, including noise associated with construction-related activities; ground disturbance; human presence; increases in sedimentation; and potential for

**TABLE 9-103: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVES 2-6**

Scientific Name Common Name	WHR Habitat Type Impacted	Impact Summary
<b>Birds</b>		
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>		
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillei</i> Western red bat	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in the Yosemite Lodge and Camp 4 areas.
SOURCE: NPS 2012c		

incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these restorative actions would restore the 100-year floodplain and associated riparian community, improve hydrological connectivity to the river, and improve habitat for riparian-dependent species.

As summarized in the “Wildlife” section of this chapter, a total of 12 acres of montane riparian and valley oak woodland habitat would be restored in Segment 4 under Alternatives 2–6, resulting in direct benefits to wildlife that use these habitat types. Thus, these restorative actions would be expected to have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in El Portal (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long term include valley elderberry longhorn beetle, western pond turtle, long-eared owl, yellow warbler, and western red bat.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Actions in the El Portal area (Segment 4) include the restoration of the Greenemeyer sand pit and the restoration of riverside habitat in Abbieville and the Trailer Village. The NPS would avoid all impacts within 100-feet of elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level when implementing these common to all restoration actions. If these actions were to result in unanticipated direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4. New construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in riparian habitats in Segment 4.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 4 under Alternatives 2-6 include removing development, asphalt and imported fill from the Abbieville and Trailer Village areas. The areas would be recontoured and planted with native riparian species and oaks within the 150 foot riparian buffer. The Greenemeyer Sandpit contains fill material that precludes natural flooding and regeneration of riparian plant communities. Under Alternatives 2-6 the Greenemeyer Sandpit would be restored to natural conditions. Fill material would be removed and the topography recontoured. Native riparian vegetation would be planted to restore the natural vegetation for the site. Off-street roadside parking areas between Foresta Road and the Merced River would be formalized. These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 4 and associated plant communities and wetlands. Over time these management actions would have long-term, moderate, beneficial impacts on special status species occurring within Segment 4.

**Scenic Resource Actions.** Specific projects to protect and enhance the river’s scenic values that would occur within Segment 3 under Alternatives 2-6 include: selectively thinning conifers in the area of the Cascade Falls viewpoint. The trees to be removed are summarized in **table 9-104**. The estimated number of trees removed is by species and size as they are in 2012. Trees less than 6 inches DBH can be removed in order to maintain a vista without additional compliance, and are not included in the estimates.

**TABLE 9-104: MAXIMUM NUMBER OF TREES REMOVED COMMON TO ALTERNATIVES 2–6 IN SEGMENT 3**

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Cedar	6	0	0	1	0	0	0	<b>7</b>
Live Oak	0	1	0	0	0	0	0	<b>1</b>
Ponderosa	1	1	1	0	0	0	0	<b>3</b>
Red Fir	3	0	0	0	0	0	0	<b>3</b>
<b>Total</b>	<b>10</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>

Because most trees removed are small in size, their contribution to wildlife habitat is not as significant as larger trees within a mature forest setting. Many terrestrial mammals, birds, and bat species prefer larger trees (sometimes with suitable cavities) for shelter, nesting, and foraging. In addition, the number of trees removed is small. Thus, the specific action to selectively remove trees would result in local, long-term, and negligible adverse impacts on special status wildlife.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternatives 2–6, the Park would construct infill housing in El Portal Village Center. All housing redevelopment in this area will be outside the 100-year floodplain. All other redevelopment will be outside the 150-foot riparian buffer. The introduction of additional housing in Segment 4 would result in a minor increase in human presence, thereby resulting in long-term, minor, adverse effect on some species of special status wildlife. In addition, construction activities would have several short-term effects.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the construction area and could cause breeding birds to abandon their nests or avoid using the immediate area. New construction under Alternatives 2–6 may require removal of some trees; removal of potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle occur in areas of potential development or management

activities in El Portal. Valley elderberry longhorn beetle exit holes that verify beetle activity were found in 11 of these elderberry plants, though beetle larvae could still be present in elderberry plants without exit holes. Actions in Segment 4, including moving temporary housing units to El Portal and development at the Abbieville and Trailer Village, would result in potential indirect or direct impacts on elderberry shrubs, including removal of shrubs. Approximately 37 elderberry plants were documented within potential areas of ground disturbance, seven with exit holes. Complete impact avoidance would not be possible for these plants. The infill in El Portal would affect up to nine elderberry shrubs with stems greater than one inch in diameter. The development at Abbieville would affect up to 16 shrubs, while the development at Trailer Village would affect up to 12 shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. If these actions were to result in direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse.

## **Segment 5– 8: South Fork Merced River**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values that would occur within segments 6 and 7 under Alternatives 2–6 include measures to maintain river flows, manage campground waste, and protect cultural resources. The park would improve Wawona Campground wastewater and refuse management and facilities, remove abandoned infrastructure, and undertake numerous site-specific management measures to counteract or minimize ongoing impacts on cultural resources. Abandoned metal pipes in side channels on the South Fork Merced River causes dewatering of the floodplain terrace adjacent to the river. This infrastructure affects the natural hydrologic regime of the river. Under Alternatives 2–6, abandoned metal pipes would be removed. The South Fork Wawona Picnic Area, Wawona Store Picnic Area, and Wawona Swinging Bridge receive high levels of use. There are no formal river access points at either site, and visitors access the river by creating informal trails, thus causing loss of riparian vegetation and riverbank erosion. Under Alternatives 2–6, formal access points to the river would be established. This would help reduce impacts on riparian habitat and erosion. These actions would result in local, short-term, adverse impacts on wildlife associated with abandonment, construction and restoration activities (i.e., noise, ground disturbance, and human presence). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.



As summarized in the “Wildlife” section of this chapter, a total of three acres of montane riparian habitat would be restored in Segment 7 under Alternatives 2–6 from moving improvements away from the riparian zone, resulting in direct benefits to fish and wildlife that use these habitat types. Therefore, the action would restore habitat and in the long term and would provide local, long-term, minor, beneficial impacts on special status wildlife species that use the Merced River and adjacent riparian habitats in Wawona (WHR: riverine, montane riparian). Special status wildlife species that may benefit from restoration of riparian habitat actions over the long term include western pond turtle, harlequin duck, long-eared owl, and yellow warbler.

Special status plants may be adversely affected in the short term by construction, removal, restoration, and monitoring activities associated with management actions proposed in Segment 7. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, restoration management actions would result in a local, long-term, minor, beneficial impact on special status plant species that occur in riparian habitats.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river’s hydrologic values that would occur within Segment 6 under Alternatives 2–6 include implementation of the water conservation plan related to the minimum flow analysis for the South Fork. Although the NPS would retain current water collection and distribution system associated with the Wawona Impoundment, implementation of this action would reduce water withdrawal rates and improve the free-flowing condition of the South Fork Merced River by implementing the water conservation plan related to the minimum flow analysis for the South Fork. This management action would improve hydrologic function and restore ecological integrity of the river corridor in Segment 6 and associated plant communities and wetlands. Overall, this action would result in a local, long-term, minor, beneficial impact on special status species in Segment 6.

**Cultural Resource Actions.** Specific projects to protect and enhance the river’s cultural values that would occur within Segment 7 under Alternatives 2–6 include removing 7 campsites from Wawona Campground that cause potential impacts to sensitive archeological resources. Overall, this action would result in a local, long-term, minor, beneficial impact on special status species in Segment 6.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Proposed actions to manage visitor use and facilities in Segment 7 under Alternatives 2–6 include replacing current restroom facilities at the Wawona Store with larger facilities; increasing picnic facilities at the Wawona Store; constructing new river access, restrooms, and other visitor amenities at the Wawona Swinging Bridge area; and removing roadside parking between the store and Chilnualna Falls Road.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New construction may

require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Vegetation that is removed under Alternatives 2–6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities at Wawona because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species (including Sierra sweet bay) would be avoided during construction activities.

The Wawona Maintenance yard currently extends to the riverbank and affects riparian habitat from soil compaction, storage of nonnative fill material, and storage of vehicles and other supplies. To reduce riparian impacts and restore the area, the NPS would remove staged materials, abandoned utilities, vehicles, and the parking lot from the riparian buffer and restore the area to natural conditions. NPS would also remove roadside parking between the Wawona Store and Chilnualna Falls Road. These restoration management actions would result in local, short-term, negligible adverse impacts on wildlife associated with abandonment and restoration activities (i.e., noise, ground disturbance, and human presence). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, the action would restore habitat and in the long term would provide local, long-term, minor, beneficial impacts on special status wildlife species that use the Merced River and adjacent riparian habitats in Wawona (WHR: riverine, montane riparian). Special status wildlife species that may benefit from these restoration actions over the long term include hardhead, western pond turtle, harlequin duck, long-eared owl, and yellow warbler. These restoration actions would result in local, long-term, minor, beneficial impacts on special status plants (including Sierra sweet bay) that occur in riparian vegetation communities in the area.

**Wawona.** The only project-level action in the Wawona area that is common to Alternatives 2-6 involves the redesign of a bus stop to accommodate visitor use. This action would have local, long-term, negligible, adverse impacts on special status species.

## Summary of Impacts Common to Alternatives 2–6

Past development and human activity in the Merced River corridor have in some cases adversely affected special status species habitat and use of those habitats. As described in the paragraphs above, under Alternatives 2–6, the park would address some existing adverse impacts on habitats for special status species. This includes actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent special status species where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to reduce the ecological integrity of riparian, meadow, and aquatic habitat in targeted areas; increase channel free flow; improve water quality; and reduce erosion and scouring. Towards these ends, the park would remove abandoned infrastructure within or adjacent to the river, remove or relocate facilities that contribute to erosion/sedimentation/water quality issues, strategically place large wood within the channel, and use best management practices for revetment construction and repair throughout the river corridor. To restore meadow and riparian habitat, the park would remove informal trails and abandoned infrastructures, selectively remove encroaching conifers, improve or relocate trails that are unstable or traverse through meadow/wet habitats, restrict or manage the use of pack stock, revegetate denuded areas, and install fencing and visual cues to direct visitors away from sensitive areas. Existing natural resource management actions, such as removal of nonnative invasive plants, would continue. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow, wetland, and riparian habitats.

Implementation of a comprehensive ecological restoration program to restore natural processes to the Merced River corridor, in combination with much lower visitor use levels and extensive site-specific restoration, would result in a corridorwide, long-term, major, beneficial impact on special status species habitat. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river; enhance habitat complexity in riparian, meadow, and aquatic areas; reduce human and pack-related disturbances; and reduce nonnative species and conifer intrusion into sensitive habitats. Adverse effects related to the construction phase of these actions would be local, short term, and minor or negligible.

Actions common to Alternatives 2–6 would have no effect on the following federally listed and candidate species: Sierra Nevada bighorn sheep and whitebark pine.

Actions common to Alternatives 2–6 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

Actions in Segment 4 would result in potential indirect or direct impacts on elderberry shrubs, including possible removal of shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. Therefore, it is the determination of the NPS that the actions proposed may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

## ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Merced Lake East Meadow near the Merced Lake Ranger Station has high levels of pack stock use, which contributes to lower vegetation cover and higher levels of bare ground. Under Alternatives 2, grazing would be permanently removed from the Merced Lake East Meadow. The park would require administrative pack stock passing through the Merced Lake area to rely on pellet feed that is packed into the site instead of allowing pack stock to graze in the meadow. This would help protect meadow vegetation from high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits. Special status wildlife species that may benefit from these actions over the long term include Yosemite toad, northern goshawk, pallid bat, spotted bat, Mount Lyell shrew, western white-tailed jackrabbit, and Sierra Nevada red fox.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities under Alternative 2 would have the potential to affect special status species in Segment 1. Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 25), closing of the Merced Lake High Sierra Camp, and wilderness campground modifications. Under Alternative 2, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed. The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result from the elimination of designated camping at Moraine Dome and conversion of the Little Yosemite Valley Backpackers Campground to dispersed camping. Dispersed camping at the Merced Lake Backpackers Campground would be increased, but facilities would be reduced. Areas either closed or converted to dispersed camping would be restored to natural conditions, including restoration of native vegetation communities.

The removal of existing improvements could result in local, short-term, adverse impacts on special status wildlife, including noise related to removing infrastructures and human presence. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long-term, the programmatic management actions described above would have a local, long-term, minor, beneficial impact on special status wildlife species that use coniferous forests in the upper Merced watershed (WHR: white fir, red fir, Douglas-fir). Special status wildlife species that may benefit from these actions over the long term include northern goshawk, golden eagle, California spotted owl, olive-sided flycatcher, yellow warbler, western white-tailed jackrabbit, Pacific fisher, and Sierra Nevada red fox.

Special status plants may be adversely affected in the short term by restoration and monitoring activities associated with the programmatic management actions proposed for Segment 1. Potential

impacts include temporary disturbance and loss of habitat. These impacts would be local. Special status plant species would be avoided during management activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, these actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in upper montane coniferous forests in the area.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 2 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and the expansion of dispersed camping at Merced Lake Backpackers Camping Area into the High Sierra Camp footprint. As described above, construction activities associated with the demolition and removal of the Merced Lake High Sierra Camp could result in short-term, local, adverse impacts on special status species related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measures MM-WL-1 and MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Once completed, these actions would result in a local, long-term, minor, beneficial impact on special status species in Segment 1 by reducing stresses related to concentrated human use.

**Segment 1 Impact Summary:** Overall, actions in Segment 1 under Alternative 2 would result in local, long-term, minor, beneficial impacts on special status species.

Actions in Segment 1 under Alternative 2 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 1 under Alternative 2 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

### ***Segment 2: Yosemite Valley Impacts of Actions to Protect and Enhance River Values***

Ecological management actions that would occur within Segment 2 under Alternative 2 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; rerouting and revegetating the Valley Loop Trail through Slaughterhouse Meadow out of wetlands and meadows to an upland area; moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow; removing several buildings at Yosemite Lodge out of the 100-year floodplain and restoring the area.

Special status species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit from actions that remove infrastructure from the floodplain. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the 2-year to 10-year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

Special status wildlife and their habitats may be adversely affected in the short-term by construction/removal, restoration, and monitoring activities associated with these management actions. Potential impacts include disturbance associated with noise from construction/restoration activities, human presence, and modification to habitat. These activities could cause wildlife to relocate or avoid the area and cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, these measures would also improve hydrologic function and restore ecological integrity of the river corridor and associated habitats, in particular meadow, riparian, and wetland habitats; address ongoing and future impacts on park resources and infrastructure; and manage visitor use and development along the river corridor in Segment 2.

As summarized in the “Wildlife” section of this chapter, a total of 271 acres of riparian, floodplain meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these management actions would have long-term, moderate, beneficial impacts on species of special status wildlife that use the Merced River and adjacent meadows and riparian habitats in Yosemite Valley (WHR types: lacustrine, wet meadow, montane riparian). Special status wildlife species that may benefit from these actions over the long term include western pond turtle, harlequin duck, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, black swift, willow flycatcher, yellow warbler, pallid bat, spotted bat, western red bat, and Pacific fisher.

Vegetation that is removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor in Segment 2. These impacts would be local and occur within or adjacent to the Merced River corridor. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Special status plant species would be avoided during management activities. However, these measures would improve the hydrologic function and restore the ecological integrity of Valley meadows. Associated beneficial impacts would include reduced fragmentation and disturbance of meadows, increased opportunities for revegetation and restoration, and enhanced hydrological connectivity between the meadows and the Merced River. Thus, restoration management actions would be expected to have a local, long-term, moderate, beneficial impact on special status species occurring within Segment 2 plant communities.

### Biological Resource Actions.

***Yosemite Valley Campgrounds:*** Under Alternative 2, specific restoration actions to enhance the river's biological values in Segment 2 include removing all campsites within 100' of the bed and banks of the Merced River and restoring 25.1 acres of floodplain/riparian habitat, and removing all informal trails and reducing roadside parking at El Capitan Meadow. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, and beneficial impacts to special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6, the NPS would remove all informal trails and reduce roadside parking through alternative striping and consolidate parking to the west end of the meadow to reduce impacts to El Capitan Meadow. Restoration of El Capitan Meadow and elimination of roadside parking adjacent to the meadow would result in local, long-term, minor, and beneficial impacts on special status species from reduction in trampling from foot traffic and impacts to meadow habitat associated with roadside parking. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Ahwahnee Meadow:*** Specific actions under Alternative 2 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible, removing 900 feet of Northside Drive and relocating the bike path to the south of Ahwahnee Meadow, and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on special status species at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Stoneman Meadow:*** Under Alternative 2, the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boystown area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275'). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on special status species. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 2 include restoring 35.6 acres of the 10-year floodplain. Under Alternative 2, the park would remove the remaining asphalt, decompact soils of former roads and campsites, and re-establish seasonal channels and natural topography that have been filled. Additionally, the park would remove the Lower River amphitheater structure and fill. Following habitat restoration, temporary fencing would be installed to protect the restoration areas and to allow for recovery. Restoration of the Former Upper and Lower River



Campgrounds would result in local, long-term, moderate, and beneficial impacts on special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 2 include: relocating unimproved Camp 6 parking and rerouting a portion of Northside Drive; removing the Stoneman, Ahwahnee and Sugarpine Bridges; and restoring these areas to natural conditions. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 2 would significantly reduce the maximum daily visitation to Yosemite Valley from current levels to facilitate maximum resource restoration and reduce crowding and congestion within Segment 2. Actions to manage visitor use and facilities under Alternative 2, specifically those concerning vehicle access and number of overnight accommodations, would result in a 33% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 13,900. Day use visitation would decrease by 36%, while overnight visitation would decrease by 26%. Under Alternative 2, there would also be a reduction in Valley lodging units. Changes in lodging would include the removal of units from Housekeeping Camp, conversion of the Yosemite Lodge to a day use facility, and an increase in units at Curry Village. The park would reduce the total number of campsites within the Valley. This change stems largely from campsite removals at Upper Pines, Lower Pines, and North Pines campgrounds, and additions at Yosemite Lodge.

A general reduction in focused visitor use at areas near special status species or their habitats would result in a reduction of ongoing minor, adverse impacts from disturbance, trampling, and erosion; however, construction activities associated with proposed management actions could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Construction activities would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New parking areas and paths may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags

would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Vegetation that is removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on special status plants that occur in habitats in Segment 2.

**Curry Village & Campgrounds.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Curry Village include the construction of 78 hard-sided units. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities associated with proposed actions at Curry Village could disturb special status wildlife habitat where new facilities are constructed. These activities would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (6.35 acres impacted) and, to a much lesser extent, wet meadow (0.03 acres impacted) habitat. Special status species that could be affected by actions at Curry Village are presented in **table 9-105**. As described in the “Vegetation” section, the proposed actions at Curry Village would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in **table 9-65**, up to 6.35 acres of ponderosa pine habitat would be affected by the actions proposed for Curry Village under Alternative 2. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have

**TABLE 9-105: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 2**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Wet Meadow	6.35 0.03	0.4% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillei</i> Western red bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-105: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 2 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Curry Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Curry Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Curry Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Curry Village under Alternative 2.

**Camp 6 and Yosemite Village.** Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center Parking Area would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and out of the dynamic 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems.

Construction activities at Camp 6 and Yosemite Village could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed.

Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in montane riparian (1.37 acres impacted) and ponderosa pine forest (9.03 acres impacted) habitat types. Special status species that could be affected by actions at Camp 6 and Yosemite Village are presented in **table 9-106**. As described in the “Vegetation” section, the proposed actions at Camp 6 and Yosemite Village would primarily affect ponderosa pine forest and montane riparian habitats surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in table 9-106, up to 9.03 acres of ponderosa pine habitat and 1.37 acres of montane riparian habitat would be affected by the actions proposed for Camp 6 and Yosemite Village under Alternative 2. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for special status bird species would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

The rerouting of Northside Drive outside the 10-year floodplain would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, minor, beneficial impact on special status plant and wildlife species in Segment 2.

It is unlikely that any special status plant species occur in the Camp 6 and Yosemite Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Camp 6 and Yosemite Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Camp 6 and Yosemite Village under Alternative 2.

**TABLE 9-106: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 2**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Riparian	9.03 1.37	0.5% 0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 10.40 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	9.03	0.5%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 9.03 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Chaetura vauxi</i> Vaux's swift	Montane Riparian	1.37	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 1.37 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Contopus cooperi</i> Olive-sided flycatcher	Montane Riparian	1.37	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 1.37 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Setophaga petechia</i> Yellow warbler	Montane Riparian	1.37	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 1.37 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Riparian Urban	9.03 1.37 N/A	0.5% 0.4% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-106: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 2 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Riparian Urban	9.03 1.37 N/A	0.5% 0.4% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Montane Riparian	9.03 1.37	0.5% 0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine Montane Riparian	9.03 1.37	0.5% 0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	9.03	0.5%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	9.03	0.5%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Camp 6 and Yosemite Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

**Yosemite Lodge and Camp 4.** Specific actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the conversion of Yosemite Lodge to a day-use facility and the addition of 250 parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day-use parking spaces and area for 15 tour buses; the removal of old and temporary housing at Highland Court and the Thousands Cabins; the conversion of Highland Court to a walk-in campground; and the relocation of the pedestrian crossing at Northside Drive and



Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts. The conversion of Yosemite Lodge to a day-use facility and the conversion of Highland Court to a walk-in campground would have a negligible effect on special status species.

Construction activities at Yosemite Lodge and Camp 4 could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (14.90 acres impacted), montane hardwood (0.57 acres impacted), and wet meadow (0.12 acres impacted). Special status species that could be affected by actions at Yosemite Lodge and Camp 4 are presented in table 9-107. As described in the “Vegetation” section, the proposed actions at Yosemite Lodge and Camp 4 would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in table 9-107, up to 14.90 acres of ponderosa pine habitat and 0.57 acres of montane hardwood habitat would be affected by the actions proposed for Yosemite Lodge and Camp 4 under Alternative 2. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Yosemite Lodge and Camp 4 area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Yosemite Lodge and Camp 4 area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Yosemite Lodge and Camp 4 under Alternative 2.

**TABLE 9-107: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 2**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
Birds				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	14.90	0.08	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 15.47 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
	Montane Hardwood	0.57	<0.1%	
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	14.90	0.08	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 15.47 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
	Montane Hardwood	0.57	<0.1%	
Mammals				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine	14.90	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.57	<0.1%	
	Wet Meadow	0.12	<0.1%	
	Urban	N/A	N/A	
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine	14.90	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.57	<0.1%	
	Wet Meadow	0.12	<0.1%	
	Urban	N/A	N/A	
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine	14.90	0.08	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
	Wet Meadow	0.12	<0.1%	
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine	14.90	0.08	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-107: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 2 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	14.90	0.08	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
	Montane Hardwood	0.57	<0.1 %	
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	14.90	0.08	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Yosemite Lodge and Camp 4.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

**Segment 2 Impact Summary:** Overall, actions in Segment 2 under Alternative 2 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segment 2 under Alternative 2 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 2 under Alternative 2 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Currently, vehicles park under the dripline of the 38 valley oak trees in Segment 4. This practice compacts soil under the trees and affects root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 2, valley oaks in El Portal would be enhanced by creating an oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in

Segment 4. Valley oaks are a park-designated special status species. These restorative actions could result in local, short-term, adverse impacts on special status wildlife within the adjacent riparian habitat, including from noise associated with construction-related activities, ground disturbance, human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these restorative actions would restore the 100-year floodplain and associated riparian community, improve hydrological connectivity to the river, and improve habitat for riparian-dependent species.

As summarized in the “Wildlife” section of this chapter, a total of 13 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, these actions would be expected to have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in El Portal (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long term include valley elderberry longhorn beetle, western pond turtle, long-eared owl, yellow warbler, and western red bat.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Actions in Segment 4) include the restoration of the Greenemeyer sand pit and the restoration of riverside habitat in Abbieville and the Trailer Village. The NPS would avoid all impacts within 100-feet of elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level when implementing these common to all restoration actions. If these actions were to result in unanticipated direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation that is removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, restoration actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in riparian habitats in Segment 4.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 2, user capacity would mostly be affected by the increase in employee housing at El Portal (Segment 4), where NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat and employee parking would be added at Rancheria Flat, El Portal, and Abbieville. While all new units would be built outside of the 100-year floodplain, units would fall within the river corridor. This increase in capacity in El Portal is a function of the decrease in

employee housing capacity in the Valley (Segment 2). Administrative campsites from the Yellow Pine Campground would also be relocated to Segment 4. The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Construction, removal, and restoration activities associated with these management actions in Segment 4 could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New construction may require removal of some trees; removal of potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts under Alternative 2 to minor and adverse.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle occur in areas of potential development or management activities in El Portal. Valley elderberry longhorn beetle exit holes that verify beetle activity were found in 11 of these elderberry plants, though beetle larvae could still be present in elderberry plants without exit holes. Actions in Segment 4, including moving temporary housing units to El Portal and development at the Abbieville and Trailer Village, would result in potential indirect or direct impacts on elderberry shrubs, including removal of shrubs. Approximately 37 elderberry plants were documented within potential areas of ground disturbance, seven with exit holes. Complete impact avoidance would not be possible for these plants. The infill in El Portal would affect up to nine elderberry shrubs with stems greater than one inch in diameter. The development at Abbieville would affect up to 16 shrubs, while the development at Trailer Village would affect up to 12 shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. If these actions were to result in direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation that is removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities.

**Segments 3 and 4 Impact Summary:** Overall, actions in Segments 3 and 4 under Alternative 2 would result in local, long-term, minor, beneficial impacts on most special status species.

Actions in Segments 3 and 4 under Alternative 2 would have no effect on the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Pacific fisher, Sierra Nevada bighorn sheep, and whitebark pine.

It is the determination of the NPS that the actions proposed in Segment 4 under Alternative 2 may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

### **Segments 5–8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2 in Segment 7, the Wawona Golf Course would be decommissioned and the area returned to a more natural setting through recontouring and revegetation. The Wawona Golf Course is located in a former meadow, which altered vegetation patterns, compacted soils, and interrupted meadow hydrology. Under Alternative 2, the golf course would be removed and the area would be restored to meadow habitat. This action could result in local, short-term, minor, adverse impacts on special status wildlife, including impacts from noise and ground disturbance associated with removal and restoration activities, increased human presence, and habitat modifications. In the long term, the park would reduce the built environment and increase meadow habitat in Wawona under Alternative 2.

As summarized in the “Wildlife” section in this chapter, a total of 52 acres of floodplain, riparian and meadow habitat would be restored in segment 7 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to wildlife that use these habitat types. Thus, restoring the Wawona Golf Course to a more natural setting would likely have a segmentwide, long-term, moderate, beneficial impact on special status wildlife species that use meadow and riparian habitats in Wawona (WHR: wet meadow). Special status wildlife species that may benefit from this action over the long term include western pond turtle, golden eagle, northern harrier, long-eared owl, great gray owl, olive-sided flycatcher, willow flycatcher, yellow warbler, pallid bat, spotted bat, and western red bat.

Special status plants may be adversely affected in the short term by removal, restoration, and monitoring activities associated with restoration of the golf course. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and

adverse. Overall, actions under Alternative 2 would result in local, long-term, minor, beneficial impacts on special status plants that occur in meadow habitats in the Wawona area.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 2 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on special status species in Segment 7.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 2 in Segment 7, Wawona stables operations would be eliminated and two stock campsites would be relocated to this area from the current Wawona stock camp. The Wawona tennis courts would be removed, and 32 campsites in the Wawona Campground would be removed from the floodplain and/or from cultural sites. Campsites in Wawona Campground are located in proximity to the river, which results in trampling of riparian vegetation and riverbank erosion. Under Alternative 2, campsites within the 100-year floodplain would be removed and the area would be restored. Soils would be decompacted, and the area would be replanted with riparian vegetation. This would reduce visitor use in this area, with a resulting decrease of vegetation trampling. These actions would result in short-term, adverse impacts on special status wildlife that uses riparian habitat. Adverse impacts include noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to immediate areas of the South Fork Merced River. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these actions would reduce the built environment within Segment 7, restore riparian habitat, and reduce riverbank erosion. Thus, the actions would likely have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in Wawona (WHR: montane riparian). These potentially include long-eared owl and yellow warbler.

Special status plants may be adversely affected in the short term by removal, restoration, and monitoring activities associated with these management actions. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, actions under Alternative 2 would result in local, long-term, negligible, beneficial impacts on special status plants that occur in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 32 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on special status species in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Overall, actions in Segments 5-8 under Alternative 2 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.



Actions in Segments 5-8 under Alternative 2 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segments 5-8 under Alternative 2 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Past development and human activity in the Merced River corridor have in some cases adversely affected special status species habitat and use of those habitats. As described in the preceding paragraphs, many of the actions under Alternative 2 would address existing adverse impacts on habitats for special status species. This includes actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent special status species where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to restore the ecological integrity of riparian, meadow, and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. Notable actions the park would implement under Alternative 2 include the following:

- Restrict recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Remove facilities within the 100-year floodplain of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Generally, Alternative 2 is focused on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2), emphasizing day use of the Valley over overnight accommodations; removing many facilities that are located in the 100-year floodplain and are jeopardized by flood; repurposing park facilities to improve efficiency of use; and providing adequate lodging, camping, and parking space for visitors and employees. Adverse effects from these actions would be associated with the active construction or restoration phase, and would be local, short term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on special status species as habitats are restored and fragmentation and indirect detriments to habitat are reduced. These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Implementation of a comprehensive ecological restoration program to restore natural processes to the Merced River corridor, in combination with much lower visitor use levels and extensive site-specific restoration, would result in a corridorwide, long-term, major, beneficial impact on special status species habitat. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river; enhance habitat complexity in riparian, meadow, and aquatic areas; reduce human and pack-related disturbances; and reduce nonnative species and conifer intrusion into sensitive habitats. Adverse effects related to the construction phase of these actions would be local, short term, and minor or negligible.

Actions under Alternative 2 would have no effect on the following federally listed and candidate species: Sierra Nevada bighorn sheep and whitebark pine.

Actions under Alternative 2 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

Actions in Segment 4 under Alternative 2 would result in potential indirect or direct impacts on elderberry shrubs, including possible removal of shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. Therefore, it is the determination of the NPS that the actions proposed may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on special status species in combination with Alternative 2 are the same as those listed under the “Environmental Consequences of Alternative 1 (No Action)” subsection above.

#### ***Overall Cumulative Impact from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

The actions associated with Alternative 2 would generally result in long-term, minor to moderate, beneficial impacts on special status species habitats within the Merced River corridor, with the exception of valley elderberry longhorn beetle. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, special status species associated with these habitat types are most likely to be affected cumulatively by the proposed actions. The past, present, and future actions in the region would have varying effects on special status species habitats, with some projects restoring or enhancing habitats, and many other projects resulting in habitat loss or decline.

In general, past actions have impaired and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations from development and resource extraction, have resulted in a reduction in special status species populations and ranges. Present and reasonably foreseeable future actions also have the potential to further reduce or impair these habitat types; however, in general, potential effects on these habitat types are mitigated and/or

compensated through habitat preservation and/or enhancement at an off-site location (including mitigation banks). These actions provide the most benefit when coordinated with larger, regional conservation strategies that protect intact corridors or provide linkages to other areas of suitable habitat. Because the actions proposed for Alternative 2 would further increase the habitat value of the Merced River corridor, they would not contribute toward a cumulative adverse effect to special status species.

The actions under Alternative 2 would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 2 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 2, cumulative actions on special status species would result in long-term, adverse effects on special status species.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 3, preliminary grazing capacities for the Merced Lake East Meadow would be developed. When the meadow recovers, administrative grazing at established capacities would be allowed. The meadow would be monitored annually for five years, and use levels would be adapted as needed. This adaptive management of grazing in the meadow would help protect meadow vegetation from the effects of high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits, and would benefit habitat connectivity and meadow hydrology. Special status wildlife species that may benefit from these actions over the long term include Yosemite toad, northern goshawk, pallid bat, spotted bat, Mount Lyell shrew, western white-tailed jackrabbit, and Sierra Nevada red fox.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect special status species in Segment 1 under Alternative 3. Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 75), conversion of the Merced Lake High Sierra Camp, and wilderness campground modifications. Under Alternative 3, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed. The area would be used as a temporary pack camp for up to 15 people. The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result primarily from the decrease in designated camping in Little Yosemite Valley Areas either closed or converted to dispersed camping would be restored to natural conditions, including restoration of native vegetation communities.

The removal of existing improvements could result in short-term, local, adverse impacts on special status wildlife, including from noise related to removal of infrastructures and human presence. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long-term, the programmatic management actions described above would have a local, long-term, minor, beneficial impact on special status wildlife species that use coniferous forests in the upper Merced watershed (WHR: white fir, red fir, Douglas-fir). Special status wildlife species that may benefit from these actions over the long term include northern goshawk, golden eagle, California spotted owl, olive-sided flycatcher, yellow warbler, western white-tailed jackrabbit, Pacific fisher, and Sierra Nevada red fox.

Special status plants may be adversely affected in the short term by restoration and monitoring activities associated with the programmatic management actions proposed for Segment 1. Potential impacts include temporary disturbance and loss of habitat. These impacts would be local. Special status plant species would be avoided during management activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, Alternative 3 would result in local, long-term, minor, beneficial impacts on special status plants that occur in upper montane coniferous forests in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 3 involve the conversion of the area to designated Wilderness, removal of all infrastructure from the Merced Lake High Sierra Camp, and use of the former camp area as a temporary stock camp. As described above, construction activities associated with the demolition and removal of the Merced Lake High Sierra Camp could result in short-term, local, adverse impacts on special status species related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Once completed, these actions would result in a local, long-term, minor, beneficial impact on special status species in Segment 1 by reducing stresses related to concentrated human use.

**Segment 1 Impact Summary:** Overall, actions in Segment 1 under Alternative 3 would result in local, long-term, minor, beneficial impacts on special status species.

Actions in Segment 1 under Alternative 3 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 1 under Alternative 3 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Ecological management actions that would occur within Segment 2 under Alternative 3 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; rerouting and revegetating the Valley Loop Trail through Slaughterhouse Meadow out of wetlands and meadows to an upland area; moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow; and removing several buildings at Yosemite Lodge out of the 100-year floodplain and restoring the area.

Special status species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit from actions that remove infrastructure within a 150-foot buffer of the river in Segment 2. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the 2-year to 10-year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

Special status wildlife and their habitats may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with these management actions. Potential impacts include disturbance associated with noise from construction/restoration activities, human presence, and modification to habitat. These activities could cause wildlife to relocate or avoid the area and cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife, and could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, these measures would also improve hydrologic function and restore ecological integrity of the river corridor and associated habitats, in particular meadow, riparian, and wetland habitats; address ongoing and future impacts on park resources and infrastructure; and manage visitor use and development along the river corridor in Segment 2.

As summarized in the “Wildlife” section of this chapter, a total of 230 acres of riparian, floodplain, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these management actions would have segmentwide, long-term, moderate, beneficial impacts on species of special status wildlife that use the Merced River and adjacent meadows and riparian habitats in the Valley (WHR types: lacustrine, wet meadow, montane riparian). Special status wildlife species that may benefit from these actions over the long term include western pond turtle, harlequin duck, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, black swift, willow flycatcher, yellow warbler, pallid bat, spotted bat, western red bat, and Pacific fisher.

Vegetation that is removed under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor in Segment 2. These impacts would be local and occur within or adjacent to the river corridor. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Special status plant species would be avoided during management activities. However, these measures would improve the hydrologic function and restore the ecological integrity of Valley meadows. Associated beneficial impacts would include reduced fragmentation and disturbance of meadows, increased opportunities for revegetation and restoration, and enhanced hydrological connectivity between the meadows and the Merced River. Thus, restoration management actions would be expected to have a local, long-term, moderate, beneficial impact on special status species occurring within Segment 2 plant communities.

#### **Biological Resource Actions.**

***Yosemite Valley Campgrounds:*** Under Alternative 3, specific restoration actions to enhance the river’s biological values in Segment 2 include removing all campsites within 150 feet of the bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, beneficial impacts to special status species including long-eared owl, yellow warbler, and Townsend’s big-eared bat.

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6, the NPS would use restoration fencing and signing to designate appropriate meadow access points, remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on special status species from reduction of trampling from foot traffic that causes habitat fragmentation. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux’s swift, pallid bat, Townsend’s big-eared bat, and spotted bat.

***Ahwahnee Meadow:*** Similar to Alternative 2, specific actions under Alternative 3 in Segment 2 to enhance the river’s biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible, removing 900 feet of Northside Drive and relocating the bike path to

the south of Ahwahnee Meadow, and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on special status species at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Stoneman Meadow:*** Like Alternative 2, under Alternative 3 the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boystown area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275 feet). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on special status species. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 3 are similar to Alternative 2, which include restoring 35.6 acres of the 10-year floodplain. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 3 include: relocating unimproved Camp 6 parking; removing the Stoneman, Ahwahnee and Sugarpine Bridges; and restoring these areas to natural conditions. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Alternative 3 would reduce the maximum daily visitation allowed in Yosemite Valley from current levels to allow for increased resource restoration and reduce crowding and congestion. Actions to manage visitor use and facilities under Alternative 3, specifically those concerning vehicle access and



number of overnight accommodations, would result in a 37% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 13,200. Day use visitation would decrease by 43%, while overnight visitation would decrease by 23%. Under Alternative 3, there would be a net reduction in Yosemite Valley lodging units. This is largely due to the removal of units from Housekeeping Camp, Curry Village, and Yosemite Lodge. The park would increase the total number of campsites within the Valley. This change is largely due to new campsite development east of Camp 4, west of Backpackers Campground, and in the Upper Pines Loop Addition.

Actions to significantly limit day use activities, overnight capacities, and day parking would effectively reduce the built environment and human presence within the Valley. Restoring habitat in Segment 2 after the removal of facilities and parking lots would increase the extent and contiguity of habitat for special status species; limiting day use activities and roadside parking would reduce impacts on sensitive habitats such as riparian woodland and wet meadows; and reducing overnight capacities would reduce human pressures on special status species in general.

A general reduction in focused visitor use at areas near special status species or their habitats under Alternative 3 would result in a long-term reduction of ongoing minor, adverse impacts in Segment 2 from disturbance, trampling, and erosion; however, in the short-term, construction, removal, and restoration activities associated with proposed management actions could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New parking areas and paths may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal under Alternative 3 would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided in Segment 2. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

Vegetation that is removed under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce

local, short-term impacts to minor and adverse. Overall, these actions would result in local, short-term, minor, adverse impacts on special status plants in habitats in Segment 2.

**Curry Village & Campgrounds.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village and the rerouting of South Side Drive at Boys Town. Construction activities associated with proposed actions at Curry Village could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (6.35 acres impacted) and, to a much lesser extent, wet meadow (0.03 acres impacted) habitat. Special status species that could be affected by actions at Curry Village are presented in **table 9-108**. As described in the “Vegetation” section, the proposed actions at Curry Village would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in table 9-108, up to 6.35 acres of ponderosa pine habitat would be affected by the actions proposed for Curry Village under Alternative 3. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Curry Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Curry Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Curry Village under Alternative 3.

**Camp 6 and Yosemite Village.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center Parking Area

**TABLE 9-108: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 3**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Wet Meadow	6.35 0.03	0.4% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillei</i> Western red bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-108: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 3 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Curry Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and out of the dynamic 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems.

Construction activities at Camp 6 and Yosemite Village could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in montane riparian (1.37 acres impacted) and ponderosa pine forest (9.03 acres impacted) habitat types. Special status species that could be affected by actions at Camp 6 and Yosemite Village are presented in **table 9-109**. As described in the “Vegetation” section, the proposed actions at Camp 6 and Yosemite Village would primarily affect ponderosa pine forest and montane riparian habitats surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in table 9-109, up to 9.03 acres of ponderosa pine habitat and 1.37 acres of montane riparian habitat would be affected by the actions proposed for Camp 6 and Yosemite Village under Alternative 3. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for

**TABLE 9-109: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 3**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Riparian	9.03 1.37	0.5% 0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 10.40 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine	9.03	0.5%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 9.03 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Chaetura vauxi</i> Vaux's swift	Montane Riparian	1.37	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 1.37 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Contopus cooperi</i> Olive-sided flycatcher	Montane Riparian	1.37	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 1.37 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Setophaga petechia</i> Yellow warbler	Montane Riparian	1.37	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 1.37 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Riparian Urban	9.03 1.37 N/A	0.5% 0.4% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-109: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 3 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Riparian Urban	9.03 1.37 N/A	0.5% 0.4% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Montane Riparian	9.03 1.37	0.5% 0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine Montane Riparian	9.03 1.37	0.5% 0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	9.03	0.5%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	9.03	0.5%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Camp 6 and Yosemite Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

special status bird species would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

The rerouting of Northside Drive outside the 10-year floodplain would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, minor, beneficial impact on special status plant and wildlife species in Segment 2.

It is unlikely that any special status plant species occur in the Camp 6 and Yosemite Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Camp 6 and Yosemite Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Camp 6 and Yosemite Village under Alternative 3.

**Yosemite Lodge and Camp 4.** Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day-use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.

Construction activities at Yosemite Lodge and Camp 4 could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (14.80 acres impacted) and montane hardwood (0.08 acres impacted). Special status species that could be affected by actions at Yosemite Lodge and Camp 4 are presented in **table 9-110**. As described in the “Vegetation” section, the proposed actions at Yosemite Lodge and Camp 4 would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.



**TABLE 9-110: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 3**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
Birds				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 14.88acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
	Montane Hardwood	0.08	<0.1%	
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 14.88acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
	Montane Hardwood	0.08	<0.1%	
Mammals				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.08	<0.1%	
	Urban	N/A	N/A	
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.08	<0.1%	
	Urban	N/A	N/A	
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine	14.80	0.08%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.08	<0.1%	

**TABLE 9-110: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 3 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Yosemite Lodge and Camp 4.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

Construction of new facilities will require some tree removal. As noted in table 9-110, up to 14.80 acres of ponderosa pine habitat and 0.08 acres of montane hardwood habitat would be affected by the actions proposed for Yosemite Lodge and Camp 4 under Alternative 3. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Yosemite Lodge and Camp 4 area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil

compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Yosemite Lodge and Camp 4 area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Yosemite Lodge and Camp 4 under Alternative 3. **Segment 2 Impact Summary:** Overall, actions in Segment 2 under Alternative 3 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segment 2 under Alternative 3 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 2 under Alternative 3 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Currently, vehicles park under the dripline of the 38 valley oak trees in Segment 4. This practice compacts soil under the trees and impacts root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 3, valley oaks in El Portal would be enhanced by creating an oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in Segment 4. Valley oaks are a park-designated special status species.

These restorative actions could result in local, short-term, adverse impacts on special status wildlife within the adjacent riparian habitat, including from noise associated with construction-related activities, ground disturbance, human presence, increases in sedimentation, and the potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these restorative actions would restore the 100-year floodplain and associated riparian community, improve hydrological connectivity to the river, and improve habitat for riparian-dependent species.

As summarized in the “Wildlife” section of this chapter, a total of 13 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, these actions would be expected to have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in El Portal (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long

term include valley elderberry longhorn beetle, western pond turtle, long-eared owl, yellow warbler, and western red bat.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Actions in the El Portal area (Segment 4) include the restoration of the Greenemeyer sand pit and the restoration of riverside habitat in Abbieville and the Trailer Village. The NPS would avoid all impacts within 100-feet of elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level when implementing these common to all restoration actions. If these actions were to result in unanticipated direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4, as new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, restoration actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in riparian habitats in Segment 4 these areas.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 3, user capacity would be mostly affected by the increase in employee housing at El Portal in Segment 4. NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat and employee parking would be added at Abbieville, El Portal, and Rancheria Flat. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in the Valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4. Construction, removal, and restoration activities associated with these management actions could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New construction may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local

special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle occur in areas of potential development or management activities in El Portal. Valley elderberry longhorn beetle exit holes that verify beetle activity were found in 11 of these elderberry plants, though beetle larvae could still be present in elderberry plants without exit holes. Actions in Segment 4, including moving temporary housing units to El Portal and development at the Abbieville and Trailer Village, would result in potential indirect or direct impacts on elderberry shrubs, including removal of shrubs. Approximately 37 elderberry plants were documented within potential areas of ground disturbance, seven with exit holes. Complete impact avoidance would not be possible for these plants. The infill in El Portal would affect up to nine elderberry shrubs with stems greater than one inch in diameter. The development at Abbieville would affect up to 16 shrubs, while the development at Trailer Village would affect up to 12 shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. If these actions were to result in direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 3 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities

**Segments 3 and 4 Impact Summary:** Overall, actions in Segments 3 and 4 under Alternative 3 would result in local, long-term, minor, beneficial impacts on most special status species.

Actions in Segments 3 and 4 under Alternative 3 would have no effect on the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Pacific fisher, Sierra Nevada bighorn sheep, and whitebark pine.

It is the determination of the NPS that the actions proposed in Segment 4 under Alternative 3 may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

## Segments 5–8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 3 in Segment 7, the Wawona Golf Course would be decommissioned and the area returned to a more natural setting through recontouring and revegetation. The Wawona Golf Course is located in a former meadow; this resulted in altering vegetation patterns, compacting soils, and interrupting meadow hydrology. Under Alternative 3, the golf course would be removed and the area would be restored to meadow habitat. This action could result in local, short-term, minor, adverse impacts on special status wildlife, including impacts from noise and ground disturbance associated with removal and restoration activities, increased human presence, and habitat modifications.

In the long term, the park would reduce the built environment and increase meadow habitat in Wawona. As summarized in the “Wildlife” section of this chapter, a total of 48 acres of floodplain, riparian and meadow habitat would be restored in Segment 7 under Alternative 3 (this includes actions common to Alternatives 2-6), resulting in direct benefits to wildlife that use these habitat types. Thus, restoring the golf course to natural conditions would likely have a segmentwide, long-term, moderate, beneficial impact on special status wildlife species that use meadow and riparian habitats in Segment 7 (WHR: wet meadow). Special status wildlife species that may benefit from this action over the long term include western pond turtle, golden eagle, northern harrier, long-eared owl, great gray owl, olive-sided flycatcher, willow flycatcher, yellow warbler, pallid bat, spotted bat, and western red bat.

Special status plants may be adversely affected in the short term by removal, restoration, and monitoring activities associated with restoration of the golf course. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, actions under Alternative 3 would result in local, long-term, minor, beneficial impacts on special status plants that occur in meadow habitats in Segment 7.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on special status species in Segment 7.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 3 in Segment 7, the Wawona stables operations would be eliminated and two stock campsites would be relocated to the former stable area from the current Wawona stock camp. The Wawona tennis courts would be removed, and 27 campsites in the Wawona Campground would be removed from within 150 feet of the South Fork Merced River or from cultural sites. These areas would be restored. Soils would be decompacted and planted with riparian vegetation. This would reduce visitor use in Segment 7 resulting in a decrease of vegetation trampling.

These actions would result in short-term adverse impacts on special status wildlife species that use riparian habitat in Segment 7. Adverse impacts would include noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to immediate areas of the Merced River. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these actions would reduce the built environment within Segment 7, restore riparian habitat, and reduce riverbank erosion. Thus, the actions would be expected to have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in Segment 7 (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long term include long-eared owl and yellow warbler.

Special status plants may be adversely affected in the short term by removal, restoration, and monitoring activities associated with these management action. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, these actions would result in local, long-term, negligible, beneficial impacts on special status plants that occur in Segment 7.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on special status species in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Overall, actions in Segments 5-8 under Alternative 3 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segments 5-8 under Alternative 3 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segments 5-8 under Alternative 3 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Past development and human activity in the Merced River corridor have in some cases adversely affected special status species habitat and use of those habitats. As described in the preceding paragraphs, many of the actions under Alternative 3 would address existing adverse impacts on habitats for special status species, including actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent special status species where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to restore the ecological integrity of riparian, meadow, and aquatic habitat in targeted areas;



increase channel free flow; improve water quality; and reduce erosion and scouring. Notable actions the park would implement under Alternative 3 include the following:

- Restrict recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space;
- Remove facilities within 150 feet of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Generally, Alternative 3 is focused on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2); removing many facilities that are located within 150 feet of the Merced River and are jeopardized by flood; repurposing park facilities to improve efficiency of use; and providing adequate lodging, camping, and parking space for visitors and employees. With the implementation of mitigation measures MM-WL-1 through MM-WL-7 (see Appendix C), as applicable, adverse effects from these actions would be associated with the active construction or restoration phase and would be local, short term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on special status species as habitats are restored and fragmentation and indirect detriments to habitat are reduced. These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Implementation of a comprehensive ecological restoration program to restore natural processes to the Merced River corridor, in combination with much lower visitor use levels and extensive site-specific restoration, would result in a corridorwide, long-term, major, beneficial impact on special status species habitat. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river; enhance habitat complexity in riparian, meadow, and aquatic areas; reduce human and pack stock-related disturbances; and reduce nonnative species and conifer intrusion into sensitive habitats. Adverse effects related to the construction phase of these actions would be local, short term, and minor or negligible.

Actions under Alternatives 3 would have no effect on the following federally listed and candidate species: Sierra Nevada bighorn sheep and whitebark pine.

Actions under Alternative 3 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

Actions in Segment 4 under Alternative 3 would result in potential indirect or direct impacts on elderberry shrubs, including possible removal of shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. Therefore, it is the determination of the NPS that the actions proposed may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on special status species in combination with Alternative 3 are the same as those listed under Alternative 1 (No Action).

### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

The actions associated with Alternative 3 would generally result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species habitats within the Merced River corridor, with the exception of valley elderberry longhorn beetle. These actions would be focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River Corridor; therefore, special status species that are associated with these habitat types would be most likely to be affected cumulatively by the proposed actions. The past, present, and future actions in the region would have varying effects on special status species habitats, with some projects restoring or enhancing habitats, while many other projects would result in loss or decline.

In general, past actions have impaired and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations from development and resource extraction, have resulted in a reduction in special status species populations and ranges. Present and reasonably foreseeable future actions also have the potential to further reduce or impair these habitat types; however, in general, potential effects on these habitat types are mitigated and/or compensated through habitat preservation and/or enhancement at an off-site location (including mitigation banks). These actions provide the most benefit when coordinated with larger, regional conservation strategies that protect intact corridors or provide linkages to other areas of suitable habitat. Because the actions proposed for Alternative 3 would further increase the habitat value of the Merced River corridor, these actions would not contribute towards a cumulative adverse effect on special status species.

The actions under Alternative 3 would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 3 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 3, cumulative actions on special status species would result in long-term, adverse effects on special status species.

## ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, grazing would be eliminated and administrative pack stock would be required to carry pellet feed in Merced Lake East Meadow, as described for Alternatives 2. Beneficial effects to special status species would be the same as described for Alternative 2.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect special status species in Segment 1 under Alternative 4. Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 100), closure of the Merced Lake High Sierra Camp, and wilderness campground modifications. Under Alternative 4, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed. The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result primarily from the decrease in designated camping at Little Yosemite Valley Backpackers Campground and removal of bear boxes (composting toilet remains). Designated camping at Moraine Dome would continue and dispersed camping at the Merced Lake Backpackers Campground would be expanded, but facilities would be reduced (i.e., flush toilets and wastewater system would be replaced with composting toilets and bear boxes removed).

The removal of existing improvements could result in local, short-term, adverse impacts on special status wildlife, including noise related to removal of infrastructures and human presence. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. These management actions would have a local, long-term, minor, beneficial impact on special status wildlife species that use coniferous forests in the upper Merced River watershed (WHR: white fir, red fir, Douglas-fir). Special status wildlife species that may benefit from these actions over the long term include northern goshawk, golden eagle, California spotted owl, olive-sided flycatcher, yellow warbler, western white-tailed jackrabbit, Pacific fisher, and Sierra Nevada red fox.

Special status plants may be adversely affected in the short term by restoration and monitoring activities associated with the programmatic management actions proposed for Segment 1. Potential impacts include temporary disturbance and loss of habitat, although these impacts would be local. Special status plant species would be avoided during management activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, these actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in upper montane coniferous forests in Segment 1.

**Merced Lake High Sierra Camp.** The actions in the Merced Lake High Sierra Camp area proposed under Alternative 4 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and restoration of the former camp area to natural conditions. As described above, construction activities associated with the demolition and removal of the Merced Lake High Sierra Camp could result in short-term, local, adverse impacts on special status species related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Once completed, these actions would result in a local, long-term, minor, beneficial impact on special status species in Segment 1 by reducing stresses related to concentrated human use.

**Segment 1 Impact Summary:** Overall, actions in Segment 1 under Alternative 4 would result in local, long-term, minor, beneficial impacts on special status species.

Actions in Segment 1 under Alternative 4 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 1 under Alternative 4 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Ecological management actions that would occur within Segment 2 under Alternative 4 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Projects proposed in Segment 2 to protect and enhance river values involve rerouting and revegetating the Valley Loop Trail through Slaughterhouse Meadow out of wetlands and meadows to an upland area; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; and moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow.

Special status species that inhabit wetlands, riparian habitat, and riverine ecosystems would benefit from actions that remove infrastructure within a 150-foot buffer of the river. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

Special status wildlife and their habitats may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with these management actions. Potential impacts include disturbance associated with noise from construction/restoration activities, human presence, and modification to habitat. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. Although the

disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular.

The use of heavy equipment would create the potential for wildlife injuries or death, and could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, these measures would also improve hydrologic function and restore ecological integrity of the river corridor and associated habitats, in particular meadow, riparian, and wetland habitats; address ongoing and future impacts to park resources and infrastructure; and manage visitor use and development along the river corridor.

As summarized in the “Wildlife” section of this chapter, a total of 194 acres of floodplain, riparian, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these management actions would have segmentwide, long-term, moderate, beneficial impacts on species of special status wildlife that use the Merced River and adjacent meadows and riparian habitats in the Valley (WHR types: riverine, wet meadow, montane riparian). Special status wildlife species that may benefit from these actions over the long term include western pond turtle, harlequin duck, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, black swift, willow flycatcher, yellow warbler, pallid bat, spotted bat, western red bat, and Pacific fisher.

Vegetation removed under Alternative 4 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor. These impacts would be local and occur within or adjacent to the river corridor. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Special status plant species would be avoided during management activities. However, these measures would improve the hydrologic function and restore the ecological integrity of Valley meadows. Associated beneficial impacts would include reduced fragmentation and disturbance of meadows, increased opportunities for revegetation and restoration, and enhanced hydrological connectivity between the meadows and the Merced River. Thus, restoration management actions would likely have a local, long-term, moderate, beneficial impact on special status species occurring within Segment 2 plant communities.

### **Biological Resource Actions.**

***Yosemite Valley Campgrounds:*** Like Alternative 3, specific restoration actions under Alternative 4 to enhance the river’s biological values in Segment 2 include removing all campsites within 150’ of the

bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, moderate, beneficial impacts to special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6, Alternative 4 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 4 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on special status species from reduction of trampling from foot traffic that causes habitat fragmentation. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Ahwahnee Meadow:*** Specific actions under Alternative 4 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. However, unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 4. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, and beneficial impacts on special status species at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Stoneman Meadow:*** Like Alternatives 2 and 3, specific actions in Alternative 4 to enhance the biological values of the Merced River include restoring Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boystown area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275 feet). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on special status species. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 4 include restoring the topography of 19.7 acres of the floodplain. Alternative 4 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower

Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

**Hydrologic/Geologic Resource Action.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 4 include: relocating unimproved Camp 6 parking; placing large wood and engineered logjams along the base of Stoneman Bridge; removing the Ahwahnee and Sugarpine Bridges; and restoring these areas to natural conditions. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Alternative 4 would reduce the maximum daily visitation allowed in Yosemite Valley from current levels to allow for increased resource restoration and reduce crowding and congestion. Actions to manage visitor use and facilities under Alternative 4, specifically those concerning vehicle access, would result in a 19% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 17,000. Day use visitation would decrease by 29%. However, due in part to increases in campground facilities, overnight visitation would increase by about 7%. Under Alternative 4, there would be a net reduction in Valley lodging units. This would be achieved through removal of units from Housekeeping Camp and Curry Village. The park would increase the total number of campsites within the Valley. This increase would be largely due to the development of new campsites near Yosemite Lodge (west) and Camp 4 (east), as well as at Boys Town, Upper Pines Campground, Curry Village stables, and the former Upper River and Lower River campgrounds.

Restoring habitat following the removal of facilities and parking lots would increase the extent and contiguity of habitat for special status species, while limiting day use activities and roadside parking would reduce impacts to sensitive habitats such as riparian woodland and wet meadows. While a general reduction in focused visitor use near special status species or their habitats would result in a reduction of ongoing minor, adverse impacts, the construction, removal, and restoration activities associated with these management actions could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence.

The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the construction area and could



cause breeding birds to abandon their nests or avoid using the immediate area. New parking areas and paths may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Vegetation removed under Alternative 4 in Segment 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in the Valley because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse.

**Curry Village & Campgrounds.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village; the rerouting of South Side Drive at Boys Town; and the construction of a 40-site campground at Boys Town. Construction activities associated with proposed actions at Curry Village could disturb special status wildlife habitat where new facilities are constructed. These activities would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (6.35 acres impacted) and, to a much lesser extent, wet meadow (0.03 acres impacted) habitat. Special status species that could be affected by actions at Curry Village are presented in **table 9-111**. As described in the “Vegetation” section, the proposed actions at Curry Village would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in **table 9-111**, up to 6.35 acres of ponderosa pine habitat would be affected by the actions proposed for Curry Village under Alternative 4. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

**TABLE 9-111: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 4**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Wet Meadow	6.35 0.03	0.4% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-111: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 4 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammal (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Curry Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Curry Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Curry Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Curry Village under Alternative 4.

**Camp 6 and Yosemite Village.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area will be formalized with 750 parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. The intersection at Northside Drive and Village Drive (Camp 6 intersection) would be re-aligned to meet standards for a proper four-way intersection and improve performance. A three-way intersection at Sentinel Drive and

the entrance to the parking area would be added to improve traffic flow and alleviate congestion. An entry road to Camp 6 parking lot from Sentinel Drive would be added to improve traffic flow and alleviate congestion at nearby intersections. On-grade pedestrian crossings with proper sight lines would be provided to alleviate pedestrian/vehicle conflicts.

Construction activities at Camp 6 and Yosemite Village could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in montane riparian (0.81 acres impacted), ponderosa pine forest (12.22 acres impacted), and wet meadow (0.28 acres impacted) habitat types. Special status species that could be affected by actions at Camp 6 and Yosemite Village are presented in **table 9-112**. As described in the “Vegetation” section, the proposed actions at Camp 6 and Yosemite Village would primarily affect ponderosa pine forest and montane riparian habitats surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in **table 9-112**, up to 12.22 acres of ponderosa pine habitat and 0.81 acres of montane riparian habitat would be affected by the actions proposed for Camp 6 and Yosemite Village under Alternative 4. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for special status bird species would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Camp 6 and Yosemite Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Camp 6 and Yosemite Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Camp 6 and Yosemite Village under Alternative 4.

**TABLE 9-112: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 4**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Riparian	12.22 0.81	0.7% 0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 13.03 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 12.22 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Chaetura vauxi</i> Vaux's swift	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Contopus cooperi</i> Olive-sided flycatcher	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Setophaga petechia</i> Yellow warbler	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Riparian Wet Meadow Urban	12.22 0.81 0.28 N/A	0.7% 0.3% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-112: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 4 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Riparian Wet Meadow Urban	12.22 0.81 0.28 N/A	0.7% 0.3% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Montane Riparian Wet Meadow	12.22 0.81 0.28	0.7% 0.3% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillei</i> Western red bat	Ponderosa Pine Montane Riparian	12.22 0.81	0.7% 0.3%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Camp 6 and Yosemite Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

**Yosemite Lodge and Camp 4.** Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day-use parking spaces and area for 15 tour buses; relocation of existing tour

bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Construction activities at Yosemite Lodge and Camp 4 could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (14.80 acres impacted) and montane hardwood habitat (0.08 acres impacted). Special status species that could be affected by actions at Yosemite Lodge and Camp 4 are presented in **table 9-113**. As described in the “Vegetation” section, the proposed actions at Yosemite Lodge and Camp 4 would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in table 9-113, up to 14.80 acres of ponderosa pine habitat and 0.08 acres of montane hardwood habitat would be affected by the actions proposed for Yosemite Lodge and Camp 4 under Alternative 4. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Yosemite Lodge and Camp 4 area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Yosemite Lodge and Camp 4 area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Yosemite Lodge and Camp 4 under Alternative 4.

**Segment 2 Impact Summary:** Overall, actions in Segment 2 under Alternative 4 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.



**TABLE 9-113: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 4**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
Birds				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 14.88acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
	Montane Hardwood	0.08	<0.1%	
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 14.88acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
	Montane Hardwood	0.08	<0.1%	
Mammals				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.08	<0.1%	
	Urban	N/A	N/A	
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.08	<0.1%	
	Urban	N/A	N/A	
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine	14.80	0.08%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
	Montane Hardwood	0.08	<0.1%	

**TABLE 9-113: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 4 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	14.80	0.8%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Yosemite Lodge and Camp 4.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

Actions in Segment 2 under Alternative 4 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 2 under Alternative 4 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### Segments 3 and 4: Merced Gorge and El Portal

#### *Impacts of Actions to Protect and Enhance River Values*

Currently, vehicles park under the dripline of the 38 valley oak trees in Segment 4. This practice compacts soil under the trees, which impacts root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 4, valley oaks in El Portal would be enhanced by creating an oak recruitment area of one acre in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in Segment 4. Valley oaks are a park-designated special status species.

These restorative actions could result in local, short-term, adverse impacts on special status wildlife within the adjacent riparian habitat, including noise associated with construction-related activities, ground disturbance, human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these restorative actions would restore the 100-year floodplain and associated riparian community, improve hydrological connectivity to the river, and improve habitat for riparian-dependent species.

As summarized in the “Wildlife” section of this chapter, a total of 12 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, these actions would be expected to have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in El Portal (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long term include valley elderberry longhorn beetle, western pond turtle, long-eared owl, yellow warbler, and western red bat.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Actions in the El Portal area (Segment 4) include the restoration of the Greenemeyer sand pit and the restoration of riverside habitat in Abbieville and the Trailer Village. The NPS would avoid all impacts within 100-feet of elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level when implementing these common to all restoration actions. If these actions were to result in unanticipated direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 4 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, restoration actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in riparian habitats in Segment 4.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 4, visitor day parking would be expanded by 200 parking spaces at Abbieville; this area would primarily be used for visitor access to Yosemite Valley. NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat along with a total of 292 employee parking spaces. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal would be a function of the decrease in

employee housing capacity in the Valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Construction, removal, and restoration activities associated with these management actions could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure in Segment 4 would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence.

The use of heavy equipment would create the potential for wildlife injuries or death, and could cause wildlife to relocate or avoid the construction area and could cause breeding birds to abandon their nests or avoid using the immediate area. New construction may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle occur in areas of potential development or management activities in El Portal. Valley elderberry longhorn beetle exit holes that verify beetle activity were found in 11 of these elderberry plants, though beetle larvae could still be present in elderberry plants without exit holes. Actions in Segment 4, including moving temporary housing units to El Portal and development at the Abbieville and Trailer Village, would result in potential indirect or direct impacts on elderberry shrubs, including removal of shrubs. Approximately 37 elderberry plants were documented within potential areas of ground disturbance, seven with exit holes. Complete impact avoidance would not be possible for these plants. The infill in El Portal would affect up to nine elderberry shrubs with stems greater than one inch in diameter. The development at Abbieville would affect up to 16 shrubs, while the development at Trailer Village would affect up to 12 shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. If these actions were to result in direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 4 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to

previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities.

**Segments 3 and 4 Impact Summary:** Overall, actions in Segments 3 and 4 under Alternative 4 would result in local, long-term, minor, beneficial impacts on most special status species.

Actions in Segments 3 and 4 under Alternative 4 would have no effect on the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Pacific fisher, Sierra Nevada bighorn sheep, and whitebark pine.

It is the determination of the NPS that the actions proposed in Segment 4 under Alternative 4 may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

### **Segments 5– 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions specifically targeted to protect culturally sensitive areas in Segment 7, including the relocation or removal of select campsites and stock campground sites within the 100-year floodplain or culturally sensitive areas, would also benefit special status species. Campsite removal within the floodplain would result in local, long-term, minor, beneficial impacts on special status species as riparian habitat is restored and wildlife are subject to less human presence and human-related pressures.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 4 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on special status species in Segment 7.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, Wawona stables operations would be eliminated and two stock campsites would be relocated to the stables area from the current Wawona stock camp. At the Wawona Campground, 27 campsites would be removed from within 150 feet of the South Fork Merced River or from cultural sites and the area would be restored. Soils would be decompacted and the restoration area would be replanted with riparian vegetation. This would reduce visitor use in this area and result in a decrease of vegetation trampling.

These actions would result in short-term, adverse impacts on special status wildlife that use riparian habitat. Adverse impacts include noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to the South Fork Merced River. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these actions would reduce the built environment within Segment 7, restore riparian habitat, and reduce riverbank erosion.

As summarized in the “Wildlife” section of this chapter, a total of seven acres of riparian habitat would be restored in Segment 7 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), thus directly benefiting wildlife that use this habitat type. Thus, this restoration action would be expected to have a segmentwide, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in Wawona (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long term include long-eared owl and yellow warbler.

Special status plants may be adversely affected in the short term by removal, restoration, and monitoring activities associated with these management actions. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, actions under Alternative 4 would result in local, long-term, negligible, beneficial impacts on special status plants that occur in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. Overall, these actions would result in a local, long-term, minor, beneficial impact on special status species in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Overall, actions in Segments 5-8 under Alternative 4 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segments 5-8 under Alternative 4 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segments 5-8 under Alternative 4 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Past development and human activity in the Merced River corridor have in some cases adversely affected special status species habitat and use of those habitats. As described in the preceding paragraphs, many of the Alternative 4 actions would address existing adverse impacts on habitats for special status species, including actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent special status species where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to restore the ecological integrity of riparian, meadow, and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. Notable actions the park would implement under Alternative 4 include the following:

- Restrict recreational use of rivers and riverbanks to reduce riverbank erosion.

- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Remove facilities within 150 feet of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Generally, Alternative 4 is focused on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2); removing many facilities located within 150 feet of the river and jeopardized by flooding; repurposing park facilities to improve efficiency of use; adding additional campground facilities; and providing adequate lodging, camping, and parking space for visitors and employees. Adverse effects from these actions would be associated with the active construction or restoration phase and would be local, short term, and minor or negligible. However, there would be local, long-term, negligible, adverse impacts on habitats for special status species from construction of some facilities. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on special status species as habitats are restored and fragmentation and indirect detriments to habitat are reduced. These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Overall, there would be a slightly lessened potential for beneficial effects under Alternative 4 compared to Alternative 2 and about the same level of beneficial actions as under Alternative 3. However, there would be a somewhat increased potential for adverse impacts over either Alternatives 2 or 3 because more new construction would occur in and adjacent to habitat suitable for special status species.

Implementation of a comprehensive ecological restoration program to restore natural processes to the Merced River corridor, in combination with much lower visitor use levels and extensive site-specific restoration including implementation of mitigation measures MM-WL-1 through MM-WL-7 (see Appendix C) as applicable, would result in a corridorwide, long-term, moderate, beneficial impact on special status species habitat. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river; enhance habitat complexity in riparian, meadow, and aquatic areas; reduce human and pack stock-related disturbances; and reduce nonnative species and conifer intrusion into sensitive habitats. Adverse effects related to the construction phase of these actions would be local, short term, and minor or negligible.

Actions under Alternatives 4 would have no effect on the following federally listed and candidate species: Sierra Nevada bighorn sheep and whitebark pine.

Actions under Alternative 4 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.



Actions in Segment 4 under Alternative 4 would result in potential indirect or direct impacts on elderberry shrubs, including possible removal of shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. Therefore, it is the determination of the NPS that the actions proposed may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

#### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on special status species in combination with Alternative 4 are the same as those listed under Alternative 1 (No Action).

#### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

The actions associated with Alternative 4 would generally result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species habitats within the Merced River corridor, with the exception of valley elderberry longhorn beetle. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, special status species that are associated with these habitat types are most likely to be affected cumulatively by the proposed actions. The past, present, and future actions in the region would have varying effects on special status species habitats, with some projects restoring or enhancing habitats and many other projects resulting in habitat loss or decline.

In general, past actions have impaired and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations from development and resource extraction, have resulted in a reduction in special status species populations and ranges. Present and reasonably foreseeable future actions also have the potential to further reduce or impair these habitat types; however, in general, potential effects on these habitat types are mitigated and/or compensated through habitat preservation and/or enhancement at an off-site location (including mitigation banks). These actions provide the most benefit when coordinated with larger, regional conservation strategies that protect intact corridors or provide linkages to other areas of suitable habitat. Because the actions proposed with Alternative 4 would further increase the habitat value of the Merced River corridor, this alternative would not contribute toward a cumulative adverse effect on special status species.

The actions under Alternative 4 would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 4 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 4, cumulative actions on special status species would result in long-term, adverse effects on special status species.

## ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to special status species would be the same as described for Alternative 3.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect special status species in Segment 1 under Alternative 5. Visitation within Segment 1 would not be expected to change appreciably under Alternative 5; wilderness access quotas would remain as under Alternative 1 (No Action) (150) and modifications to overnight accommodations would be nominal. Under Alternative 5, the Merced Lake High Sierra Camp would remain in operation and continue to host overnight guests and through-hikers during the summer months. However, the camp's 60 beds would be reduced to 42 (11 units). The park would not reduce the total number of designated campsites within the Merced River corridor's wilderness. Designated camping at Moraine Dome and Little Yosemite Valley Backpackers Campground would continue. The Merced Lake Backpackers Campground would remain.

The removal of existing improvements could result in local, short-term, negligible, adverse impacts on special status wildlife, including noise related to removal of infrastructures and human presence. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long-term, the programmatic management actions described above would have a local, long-term, minor, beneficial impact on special status wildlife species that use coniferous forests in the upper Merced watershed (WHR: white fir, red fir, Douglas-fir). Special status wildlife species that may benefit from these actions over the long term include northern goshawk, golden eagle, California spotted owl, olive-sided flycatcher, yellow warbler, western white-tailed jackrabbit, Pacific fisher, and Sierra Nevada red fox.

Special status plants may be adversely affected in the short-term by restoration and monitoring activities associated with the programmatic management actions proposed for Segment 1. Potential impacts include temporary disturbance and loss of habitat. These impacts would be local. Special status plant species would be avoided during management activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, these actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in upper montane coniferous forests in the Segment 1.

**Merced Lake High Sierra Camp.** The project-level actions in the Merced Lake High Sierra Camp area proposed under Alternative 5 involve retention of the Merced Lake High Sierra Camp, reducing the capacity to 42 beds, and replacing the flush toilets with composting toilets. These actions would result in a local, long-term, negligible, beneficial impact on special status species in Segment 1 by reducing stresses from visitor use.

**Segment 1 Impact Summary:** Overall, actions in Segment 1 under Alternative 5 would result in local, long-term, minor, beneficial impacts on special status species.

Actions in Segment 1 under Alternative 5 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 1 under Alternative 5 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Ecological management actions that would occur within Segment 2 under Alternative 5 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Projects proposed in Segment 2 under Alternative 5 to protect and enhance river values involve constructing a boardwalk for the Valley Loop Trail through sensitive wet meadow habitat in Slaughterhouse Meadow; restoration of 10.9 acres of riparian habitat at the former Yosemite Lodge units and cabins; and moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow. Special status species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit from actions that remove infrastructure within 100 feet of the ordinary high-water mark. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts in Segment 2.

Special status wildlife and their habitats may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with these management actions. Potential impacts include disturbance associated with noise from construction/restoration activities, human presence, and modification to habitat. These activities could cause wildlife to relocate or avoid the area and cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular.

The use of heavy equipment would create the potential for wildlife injuries or death, and could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, these measures would also improve hydrologic function and restore ecological integrity of the river corridor and associated habitats, in particular meadow, riparian, and wetland habitats; address ongoing and future impacts to park resources and infrastructure; and manage visitor use and development along the river corridor in Segment 2.

As summarized in the “Wildlife” section of this chapter, a total of 182 acres of floodplain, riparian, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these habitat restoration management actions would have long-term, moderate, beneficial impacts on species of special status wildlife that use the Merced River and adjacent meadows and riparian habitats in Yosemite Valley (WHR types: lacustrine, wet meadow, montane riparian). Special status wildlife species that may benefit from these actions over the long term include western pond turtle, harlequin duck, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, black swift, willow flycatcher, yellow warbler, pallid bat, spotted bat, western red bat, and Pacific fisher.

Vegetation removed under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor in Segment 2. These impacts would be local and occur within or adjacent to the river corridor. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Special status plant species would be avoided during management activities. However, these measures would improve the hydrologic function and restore the ecological integrity of Valley meadows. Associated beneficial impacts would include reduced fragmentation and disturbance of meadows, increased opportunities for revegetation and restoration, and enhanced hydrological connectivity between the meadows and the Merced River. Thus, habitat restoration actions would likely have a local, long-term, moderate, beneficial impact on special status species occurring within Segment 2 plant communities.

### **Biological Resource Actions.**

**Yosemite Valley Campgrounds:** Specific restoration actions under Alternative 5 to enhance the river’s biological values in Segment 2 include removing all campsites within 100’ of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, minor to moderate, beneficial impacts to special status species including long-eared owl, yellow warbler, and Townsend’s big-eared bat.

***El Capitan Meadow:*** In addition to actions common to Alternatives 2-6 and similar to Alternative 4, Alternative 5 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 5 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Conifers that block views of El Capitan from the roadside would be selectively removed. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on special status species from reduction of trampling from foot traffic that causes habitat fragmentation. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Ahwahnee Meadow:*** Similar to Alternative 4, specific actions under Alternative 5 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 5. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, beneficial impacts on special status species at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Stoneman Meadow:*** Specific actions in Alternative 5 to enhance the biological values of the Merced River include restoring Stoneman Meadow by redesigning the Orchard Parking Lot. Through engineering solutions, Alternative 5 would promote water flow by increasing drainage from the cliff walls of the parking lot to Stoneman Meadows, thus improving meadow health. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, beneficial impacts on special status species. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Former Upper and Lower Rivers Campgrounds:*** Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 5 include restoring 35.6 acres of riparian and floodplain habitat at Lower Rivers Campground. Alternative 5 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, beneficial impacts on special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and

development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 5 include: relocating unimproved Camp 6 parking; removing the Sugarpine Bridge; placing large wood and engineered logjams along the base of Stoneman Bridge; and improving trail connectivity and routing in the vicinity of the Ahwahnee Bridge. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall these measures would improve the free-flowing condition of the river and restore the ecological integrity of Yosemite Valley riparian habitats.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Actions to manage visitor use and facilities under Alternative 5, specifically those concerning vehicle access and overnight accommodations, would result in a 5% decrease in daily Yosemite Valley visitation, from approximately 20,900 under Alternative 1 to 19,900. Day use visitation would decrease by 14%. However, due largely to increases in lodging and campground facilities, overnight visitation would increase by about 16%. Under Alternative 5, there would be a net increase in Yosemite Valley lodging units. This would largely result from the increase in units at Curry Village and removal of units from Housekeeping Camp. The park would increase the total number of campsites within the Valley.

Maintaining and constructing new overnight camping and lodging facilities would maintain dense levels of the built environment within the Valley, resulting in long-term, minor, adverse impacts on wildlife in Segment 2 from human presence and human-related pressures (noise, human food, vegetation trampling, etc.). The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New parking areas and paths may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Vegetation that is removed under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent

to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse.

**Curry Village & Campgrounds.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village and the rerouting of South Side Drive at Boys Town. Construction and reorganization activities at Curry Village could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (6.35 acres impacted) and wet meadow (0.03 acres impacted) habitat types. Special status species that could be affected by actions at Curry Village are presented in **table 9-114**. As described in the “Vegetation” section, the proposed actions at Curry Village would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in table 9-114, up to 6.35 acres of ponderosa pine habitat would be affected by the actions proposed for Curry Village under Alternative 5. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Curry Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Curry Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Curry Village under Alternative 5.



**TABLE 9-114: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 5**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Wet Meadow Urban	6.35 0.03 N/A	0.4% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Wet Meadow	6.35 0.03	0.4% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-114: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 5 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in the Curry Village area.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

**Camp 6 and Yosemite Village.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area will be formalized to include 850 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. A pedestrian underpass and a roundabout at the Village Drive/Northside Drive (Camp 6) intersection would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection at Sentinel Drive and the entrance to the parking area would be added to improve traffic flow and alleviate congestion at nearby intersections.

Construction activities at Camp 6 and Yosemite Village could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in montane riparian (0.81 acres impacted), ponderosa pine forest (12.22 acres impacted), and wet meadow (0.28 acres impacted) habitat types. Special status species that could be affected by actions at Camp 6 and Yosemite Village are presented in **table 9-115**. As described in the “Vegetation” section, the proposed actions at Camp 6 and Yosemite Village would primarily affect ponderosa pine forest and montane riparian habitats surrounding areas that are currently developed and experience a high level of human disturbance.

**TABLE 9-115: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 5**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Riparian	12.22 0.81	0.7% 0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 13.03 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis occidentalis</i> California spotted owl	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 12.22 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Chaetura vauxi</i> Vaux's swift	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Contopus cooperi</i> Olive-sided flycatcher	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Setophaga petechia</i> Yellow warbler	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Riparian Wet Meadow Urban	12.22 0.81 0.28 N/A	0.7% 0.3% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-115: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 5 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Riparian Wet Meadow Urban	12.22 0.81 0.28 N/A	0.7% 0.3% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Montane Riparian Wet Meadow	12.22 0.81 0.28	0.7% 0.3% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine Montane Riparian	12.22 0.81	0.7% 0.3%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Camp 6 and Yosemite Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

Construction of new facilities will require some tree removal. As noted in table 9-115, up to 12.22 acres of ponderosa pine habitat and 0.81 acres of montane riparian habitat would be affected by the actions proposed for Camp 6 and Yosemite Village under Alternative 5. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for

special status bird species would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Camp 6 and Yosemite Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Camp 6 and Yosemite Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Camp 6 and Yosemite Village under Alternative 5.

**Yosemite Lodge and Camp 4.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day-use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Construction activities at Yosemite Lodge and Camp 4 could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (15.47 acres impacted) and montane hardwood (1.73 acres impacted) habitats. Special status species that could be affected by actions at Yosemite Lodge and Camp 4 are presented in **table 9-116**. As described in the “Vegetation” section, the proposed actions at Yosemite Lodge and Camp 4 would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in **table 9-116**, up to 15.47 acres of ponderosa pine habitat and 1.73 acres of montane hardwood habitat would be affected by the actions proposed for Yosemite Lodge and Camp 4 under Alternative 5. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or

**TABLE 9-116: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 5**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Hardwood	15.47 1.73	0.9% <0.1 %	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 17.20 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine Montane Hardwood	15.47 1.73	0.9% <0.1 %	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 17.20 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Hardwood Urban	15.47 1.73 N/A	0.9% <0.1 % N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Hardwood Urban	15.47 1.73 N/A	0.9% <0.1 % N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine	15.47	0.9%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillei</i> Western red bat	Ponderosa Pine	15.47	0.9%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-116: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 5 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine Montane Hardwood	15.47 1.73	0.9% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	15.47	0.9%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in the Yosemite Lodge and Camp 4 area.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Yosemite Lodge and Camp 4 area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Yosemite Lodge and Camp 4 area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Yosemite Lodge and Camp 4 under Alternative 5.



**Segment 2 Impact Summary:** Overall, actions in Segment 2 under Alternative 5 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segment 2 under Alternative 5 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 2 under Alternative 5 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Currently, vehicles park under the dripline of the 38 valley oak trees. This practice compacts soil under the trees and impacts root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity of these trees limits the area where oak seedlings can be recruited. Under Alternative 5, valley oaks in El Portal would be enhanced by creating an oak recruitment area of one acre in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in Segment 4. Valley oaks are a park-designated special status species.

These restorative actions could result in local, short-term, adverse impacts on special status wildlife within the adjacent riparian habitat, including noise associated with construction-related activities, ground disturbance, human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these restorative actions would restore the 100-year floodplain and associated riparian community, improve hydrological connectivity to the river, and improve habitat for riparian-dependent species.

As summarized in the “Wildlife” section of this chapter, a total of 12 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Thus, these restoration management actions would likely have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in El Portal (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long term include valley elderberry longhorn beetle, western pond turtle, long-eared owl, yellow warbler, and western red bat.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Actions in the El Portal area (Segment 4) include the restoration of the Greenemeyer sand pit and the restoration of riverside habitat in Abbieville and the Trailer Village. The NPS would avoid all impacts within 100-feet of elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level when implementing these common to all restoration actions. If these actions were to result in unanticipated direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, these restoration actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in riparian habitats in Segment 4.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 5, visitor day parking would be expanded by 200 parking spaces at Abbieville; this area would primarily be used for visitor access to Yosemite Valley. NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat along with a total of 292 employee parking spaces at these locations. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor in Segment 4. This increase in capacity in El Portal is a function of the decrease in employee housing capacity in the Valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Construction, removal, and restoration activities associated with these management actions under Alternative 5 could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence in Segment 4.

The use of heavy equipment would create the potential for wildlife injuries or death, and could cause wildlife to relocate or avoid the construction area and could cause breeding birds to abandon their nests or avoid using the immediate area. New construction may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located nearby. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to

construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided under Alternative 5. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse in Segment 4.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle occur in areas of potential development or management activities in El Portal. Valley elderberry longhorn beetle exit holes that verify beetle activity were found in 11 of these elderberry plants, though beetle larvae could still be present in elderberry plants without exit holes. Actions in Segment 4, including moving temporary housing units to El Portal and development at the Abbieville and Trailer Village, would result in potential indirect or direct impacts on elderberry shrubs, including removal of shrubs. Approximately 37 elderberry plants were documented within potential areas of ground disturbance, seven with exit holes. Complete impact avoidance would not be possible for these plants. The infill in El Portal would affect up to nine elderberry shrubs with stems greater than one inch in diameter. The development at Abbieville would affect up to 16 shrubs, while the development at Trailer Village would affect up to 12 shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. If these actions were to result in direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 5 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities under Alternative 5.

**Segments 3 and 4 Impact Summary:** Overall, actions in Segments 3 and 4 under Alternative 5 would result in local, long-term, minor, beneficial impacts on most special status species.

Actions in Segments 3 and 4 under Alternative 5 would have no effect on the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Pacific fisher, Sierra Nevada bighorn sheep, and whitebark pine.

It is the determination of the NPS that the actions proposed in Segment 4 under Alternative 5 may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

## **Segments 5–8: South Fork Merced River**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions specifically targeted to protect culturally sensitive areas under Alternative 5 would also benefit special status species, including the relocation or removal of selected campsites and stock campground sites that are within 100 feet of the South Fork Merced River or in culturally sensitive areas. Removing

some campsites within the floodplain would result in local, long-term, minor beneficial impact on special status species as riparian habitat is restored and wildlife are subject to less human presence and human-related pressures.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 5 include the relocation of stock use campsites from sensitive resource areas to the Wawona Maintenance Yard. Overall, this action would result in a local, long-term, minor, beneficial impact on special status species in Segment 7.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 5, Wawona stables operations would be eliminated and two stock campsites would be relocated to the Wawona Maintenance Yard from the current Wawona stock camp. In the Wawona Campground, 13 campsites would be removed from within 100 feet of the South Fork Merced River or from cultural sites and the area would be restored. Soils would be decompacted, and the area would be replanted with riparian vegetation; these actions would reduce visitor use in this area and result in decreased vegetation trampling.

These actions would result in short-term, adverse impacts on special status wildlife that uses riparian habitat. Adverse impacts would include noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to the South Fork Merced River. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these actions would reduce the built environment within Segment 7, restore riparian habitat, and reduce riverbank erosion.

As summarized in the "Wildlife" section of this chapter, a total of three acres of riparian would be restored in Segment 7 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to wildlife that use this habitat type. Thus, this restoration action would be expected to have a local, long-term, moderate, beneficial impact on special status wildlife species that use riparian habitats in Wawona (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long term include long-eared owl and yellow warbler.

Special status plants may be adversely affected in the short term by removal, restoration, and monitoring activities associated with these restoration management actions. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, these actions under Alternative 5 would result in local, long-term, negligible, beneficial impacts on special status plants that occur in the Wawona area (Segment 7).

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. Overall, these actions would result in a local, long-term, minor, beneficial impact on special status species in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Overall, actions in Segments 5-8 under Alternative 5 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segments 5-8 under Alternative 5 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segments 5-8 under Alternative 5 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Past development and human activity in the Merced River corridor have in some cases adversely affected special status species habitat and use of those habitats. As described in the preceding paragraphs, many of the actions proposed for Alternative 5 would address existing adverse impacts on habitats for special status species, including actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent special status species where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to restore the ecological integrity of riparian, meadow, and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. Notable actions the park would implement under Alternative 5 include the following:

- Restrict recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Remove facilities within 100 feet of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Generally, Alternative 5 is focused on intensive restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2); removing many facilities that are located within 100 feet of the river and are jeopardized by flooding; repurposing park facilities to improve efficiency of use; maintaining existing usage levels; and providing adequate lodging, camping, and parking space for visitors and employees. Adverse effects from these actions would be associated with the active construction or restoration phase and would be local, short term, and minor or negligible. However, there would be local, long-term, negligible, adverse impacts on habitats for special status species from construction of some facilities. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on special status species as habitats are restored and fragmentation and

indirect detriments to habitat are reduced. These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Overall, there would be a lessened potential for beneficial effects under Alternative 5 compared with Alternative 2, and a slightly lessened beneficial effect compared with Alternatives 3 and 4. However, there would be a somewhat increased potential for adverse impacts over Alternatives 2 and 3, and about the same adverse impact potential compared to Alternative 4 because more new construction would occur in and adjacent to suitable habitat for special status species.

Implementation of a comprehensive ecological restoration program to restore natural processes to the Merced River corridor, in combination with much lower visitor use levels and extensive site-specific restoration, would result in a corridorwide, long-term, moderate, beneficial impact on special status species habitat. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river; enhance habitat complexity in riparian, meadow and aquatic areas; reduce human and pack stock-related disturbances; and reduce nonnative species and conifer intrusion into sensitive habitats. Adverse effects related to the construction phase of these actions would be local, short term, and minor or negligible.

Actions under Alternatives 5 would have no effect on the following federally listed and candidate species: Sierra Nevada bighorn sheep and whitebark pine.

Actions under Alternative 5 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

Actions in Segment 4 under Alternative 5 would result in potential indirect or direct impacts on elderberry shrubs, including possible removal of shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. Therefore, it is the determination of the NPS that the actions proposed may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on special status species in combination with Alternative 5 are the same as those listed for Alternative 1 (No Action).

### ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

The actions associated with Alternative 5 would generally result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species habitats within the Merced River corridor, with the exception of valley elderberry longhorn beetle. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, special status species associated with these habitat types are most likely to be affected cumulatively by

the proposed actions. The past, present, and future actions in the region would have varying effects on special status species habitats, with some projects restoring or enhancing habitats and many other projects resulting in habitat loss or decline.

In general, past actions have impaired and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations from development and resource extraction, have resulted in a reduction in special status species populations and ranges. Present and reasonably foreseeable future actions also have the potential to further reduce or impair these habitat types; however, in general, potential effects on these habitat types are mitigated and/or compensated through habitat preservation and/or enhancement at an off-site location (including mitigation banks). These actions provide the most benefit when coordinated with larger, regional conservation strategies that protect intact corridors or provide linkages to other areas of suitable habitat. Because Alternative 5 proposed actions would further increase the habitat value of the Merced River Corridor, this alternative would not contribute toward a cumulative adverse effect on special status species.

The actions under Alternative 5 would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on special status species.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to special status species would be the same as described for Alternative 3.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities would have the potential to affect special status species in Segment 1 under Alternative 6. Visitation within Segment 1 would not be expected to change appreciably under Alternative 6; wilderness access quotas would remain as under Alternative 1 (No Action) (150) and modifications to overnight accommodations would be nominal. Under Alternative 6, the Merced Lake High Sierra Camp would remain in operation and continue to host overnight guests and through-hikers during the summer months. The camp's 60 beds (22 units) would remain. The park would not reduce the total number of designated campsites within the Merced River corridor's wilderness.



Total daily use levels in Segment 1 under Alternative 6 are estimated at 380 overnight visitors and approximately 450 day visitors. Compared with Alternative 1 (No Action), with which daily use levels are estimated at 380 overnight visitors and approximately 450 day visitors, Alternative 6 would maintain the level of use within Segment 1. Collectively, actions to maintain similar kinds and levels of use as current levels would result in continued local, long-term, minor, adverse impacts on special status species within Segment 1.

**Merced Lake High Sierra Camp.** The project-level actions in the Merced Lake High Sierra Camp area proposed under Alternative 6 involve retention of the Merced Lake High Sierra Camp and replacing the flush toilets with composting toilets. Actions to maintain similar kinds and levels of use as current levels would result in continued local, long-term, minor, adverse impacts on special status species within Segment 1.

**Segment 1 Impact Summary:** Overall, actions in Segment 1 under Alternative 6 would result in local, long-term, minor, adverse impacts on special status species.

Actions in Segment 1 under Alternative 6 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 1 under Alternative 6 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Ecological management actions that would occur within Segment 2 under Alternative 6 include measures to restore and protect meadows, riparian habitat, and areas within the 100-year floodplain of the Merced River. Projects proposed in Segment 2 under Alternative 6 to protect and enhance river values involve constructing a boardwalk for the Valley Loop Trail through sensitive wet meadow habitat in Slaughterhouse Meadow; and moving 780 feet of the Valley Loop Trail out of Bridalveil Meadow.

Special status species inhabiting wetlands, riparian habitat, and riverine ecosystems in Segment 2 would benefit from removal of some overnight camping and lodging facilities within 100 feet of the ordinary high-water mark of the Merced River under Alternative 6. Restoration of these select areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity within riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

Special status wildlife and their habitats may be adversely affected in the short-term by construction/removal, restoration, and monitoring activities associated with these management actions. Potential impacts include disturbance associated with noise from construction/restoration activities, human

presence, and modification to habitat. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular.

The use of heavy equipment would create the potential for wildlife injuries or death, and could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adherence to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoidance of the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these measures would also improve hydrologic function and restore ecological integrity of the river corridor and associated habitats, in particular meadow, riparian, and wetland habitats; address ongoing and future impacts to park resources and infrastructure; and manage visitor use and development along the river corridor.

As summarized in the “Wildlife” section of this chapter, a total of 156 acres of floodplain, riparian, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Over time, these management actions would have segmentwide, long-term, moderate, beneficial impacts on special status wildlife species that use the Merced River and adjacent meadows and riparian habitats in the Valley (WHR types: riverine, wet meadow, montane riparian). Special status wildlife species that may benefit from these actions over the long term include western pond turtle, harlequin duck, bald eagle, peregrine falcon, long-eared owl, great gray owl, California spotted owl, black swift, willow flycatcher, yellow warbler, pallid bat, spotted bat, western red bat, and Pacific fisher.

Vegetation removed under Alternative 6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities along the Merced River corridor in Segment 2. These impacts would be local and occur within or adjacent to the river corridor. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Special status plant species would be avoided during management activities. However, these measures would improve the hydrologic function and restore the ecological integrity of Valley meadows. Associated beneficial impacts would include reduced fragmentation and disturbance of meadows, increased opportunities for revegetation and restoration, and enhanced hydrological connectivity between the meadows and the Merced River. Thus, this management action would be expected to have a local, long-term, moderate, beneficial impact on special status species occurring within Segment 2 plant communities.

### Biological Resource Actions.

***Yosemite Valley Campgrounds:*** Like Alternative 5, specific restoration actions under Alternative 6 to enhance the river's biological values in Segment 2 include removing all campsites within 100' of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segmentwide, long-term, minor to moderate, beneficial impacts to special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

***El Capitan Meadow:*** Alternative 6 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. The NPS would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Additionally, Alternative 6 would selectively remove conifers that block the views of El Capitan from the roadside. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, beneficial impacts on special status species from reduction of trampling from foot traffic that causes habitat fragmentation. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Ahwahnee Meadow:*** Similar to Alternatives 4 and 5, specific actions under Alternative 6 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 6. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, beneficial impacts on special status species at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, long-eared owl, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Stoneman Meadow:*** Like Alternative 5, specific actions in Alternative 6 to enhance the biological values of the Merced River include restoring Stoneman Meadow by redesigning the Orchard Parking Lot. Through engineering solutions, Alternative 6 would promote water flow by increasing drainage from the cliff walls of the parking lot to Stoneman Meadows, thus improving meadow health. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, beneficial impacts on special status species. Special status wildlife species that may benefit from these actions over the long term include northern harrier, peregrine falcon, Vaux's swift, pallid bat, Townsend's big-eared bat, and spotted bat.

***Former Upper and Lower Rivers Campgrounds:*** Like Alternative 5, specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 6 include restoring the topography of 19.7 acres of the floodplain. Alternative 6 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close

the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, beneficial impacts on special status species including long-eared owl, yellow warbler, and Townsend's big-eared bat.

These restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities and wetlands, address ongoing and future impacts on park resources and infrastructure, and manage visitor use and development along the river corridor. These actions would be part of a comprehensive strategy to reduce existing adverse impacts on meadow and riparian vegetation. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 6 include: relocating unimproved Camp 6 parking and placing large wood and engineered logjams along the bases of Stoneman, Sugar Pine, and Ahwahnee Bridges. These actions would result in enhanced channel free flow, increased channel complexity, increased streambank stability, and restored riparian habitat segmentwide. Overall, these actions would result in a segmentwide, long-term, moderate, beneficial impact on special status species in Segment 2.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 6, specifically those concerning vehicle access and overnight accommodations, would result in a 4% increase in daily Yosemite Valley visitation, from approximately 20,900 under Alternative 1 to 21,800. Daytime visitation would decrease by 7%. However, due largely to increases in lodging and campground facilities, overnight visitation would increase by about 33%. Under Alternative 6, there would be a net increase in Yosemite Valley lodging units. This would largely result from the substantial increase in units at Yosemite Lodge and Curry Village, along with a slight reduction in Housekeeping Camp units. The park would increase the total number of campsites within the Valley.

Maintaining and constructing new overnight camping and lodging facilities would maintain dense levels of the built environment within the Valley, resulting in segmentwide, long-term, minor, adverse impacts on wildlife from human presence and human-related pressures (such as noise, human food, and vegetation trampling). The use of heavy equipment would create the potential for wildlife injuries or death, specifically for small wildlife. These activities could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New parking areas and paths may require removal of some trees; removal of potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise

and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Vegetation removed under Alternative 6 in Segment 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse.

**Curry Village & Campgrounds.** Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village including the construction of 98 hard-sided units. Construction and reorganization activities at Curry Village could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (6.35 acres impacted) and wet meadow (0.03 acres impacted) habitat types. Special status species that could be affected by actions at Curry Village are presented in **table 9-117**. As described in the “Vegetation” section, the proposed actions at Curry Village would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

Construction of new facilities will require some tree removal. As noted in table 9-117, up to 6.35 acres of ponderosa pine habitat would be affected by the actions proposed for Curry Village under Alternative 6. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

**TABLE 9-117: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 6**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 6.35 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Wet Meadow Urban	N/A 6.35 0.03	N/A 0.4% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Wet Meadow Urban	N/A 6.35 0.03	N/A 0.4% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Wet Meadow	6.35 0.03	0.4% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-117: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 6 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	6.35	0.4%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in the Curry Village area.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

It is unlikely that any special status plant species occur in the Curry Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Curry Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Curry Village under Alternative 6.

**Camp 6 and Yosemite Village.** Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area will be formalized with 850 parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. A pedestrian underpass and two roundabouts (one at the Village Drive/Northside Drive intersection and one at the Sentinel Drive/Northside Drive intersection) would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection would be added at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion.

Construction activities at Camp 6 and Yosemite Village could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in montane riparian (0.81 acres impacted), ponderosa pine forest (12.22 acres impacted), and wet meadow (0.28 acres impacted) habitat types. Special status species that could be affected by actions at Camp 6 and



Yosemite Village are presented in table 9-118. As described in the “Vegetation” section, the proposed actions at Camp 6 and Yosemite Village would primarily affect ponderosa pine forest and montane riparian habitats surrounding areas that are currently developed and experience a high level of human disturbance.

**TABLE 9-118: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 6**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Riparian	12.22 0.81	0.7% 0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 13.03 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 12.22 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Chaetura vauxi</i> Vaux's swift	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Contopus cooperi</i> Olive-sided flycatcher	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Setophaga petechia</i> Yellow warbler	Montane Riparian	0.81	0.3%	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 0.81 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.

**TABLE 9-118: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 6 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Riparian Wet Meadow Urban	12.22 0.81 0.28 N/A	0.7% 0.3% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Riparian Wet Meadow Urban	12.22 0.81 0.28 N/A	0.7% 0.3% <0.1% N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine Montane Riparian Wet Meadow	12.22 0.81 0.28	0.7% 0.3% <0.1%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillii</i> Western red bat	Ponderosa Pine Montane Riparian	12.22 0.81	0.7% 0.3%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	12.22	0.7%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in Camp 6 and Yosemite Village.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

Construction of new facilities will require some tree removal. As noted in table 9-118, up to 12.22 acres of ponderosa pine habitat and 0.81 acres of montane riparian habitat would be affected by the actions proposed for Camp 6 and Yosemite Village under Alternative 6. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for special status bird species would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Camp 6 and Yosemite Village area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Camp 6 and Yosemite Village area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Camp 6 and Yosemite Village under Alternative 6.

**Yosemite Lodge and Camp 4.** Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day-use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Construction activities at Yosemite Lodge and Camp 4 could disturb special status wildlife habitat where facilities are removed, relocated and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence. Outside of previously developed areas, impacts to wildlife habitats would occur in ponderosa pine forest (15.47 acres impacted) and montane hardwood (1.73 acres impacted) habitats. Special status species that could be affected by actions at Yosemite Lodge and Camp 4 are presented in table 9-119. As described in the “Vegetation” section, the proposed actions at Yosemite Lodge and Camp 4 would primarily affect ponderosa pine habitat surrounding areas that are currently developed and experience a high level of human disturbance.

**TABLE 9-119: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 6**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Birds</b>				
<i>Asio otus</i> Long-eared owl	Ponderosa Pine Montane Hardwood	15.47 1.73	0.9% <0.1 %	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 17.20 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<i>Strix occidentalis</i> <i>occidentalis</i> California spotted owl	Ponderosa Pine Montane Hardwood	15.47 1.73	0.9% <0.1 %	May Affect, Not Likely to Adversely Affect. Impacts include direct loss of 17.20 acres of potential foraging habitat and indirect impacts from disturbance associated with construction activities. Preconstruction surveys will ensure no active nest sites are affected.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	Ponderosa Pine Montane Hardwood Urban	15.47 1.73 N/A	0.9% <0.1 % N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Ponderosa Pine Montane Hardwood Urban	15.47 1.73 N/A	0.9% <0.1 % N/A	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of structures could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.
<i>Euderma maculatum</i> Spotted bat	Ponderosa Pine	15.47	0.9%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat). Roosting habitat (cliffs and caves) not impacted.
<i>Lasiurus blossevillei</i> Western red bat	Ponderosa Pine	15.47	0.9%	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat and roosting sites) and indirect impacts from disturbance associated with construction. Removal of trees could impact roosting sites. Preconstruction surveys will ensure no active roost sites are affected.

**TABLE 9-119: SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 6 (CONTINUED)**

Scientific Name Common Name	WHR Habitat Type Impacted	Acres Impacted	Percent of Habitat Type Affected in Segment <sup>a</sup>	Impact Summary
<b>Mammals (cont.)</b>				
<i>Eumops perotis</i> Western mastiff bat	Ponderosa Pine Montane Hardwood	15.47 1.73	0.9% <0.1 %	May Affect, Not Likely to Adversely Affect. Impacts include habitat loss (foraging habitat) and indirect impacts from disturbance associated with construction. Roosting habitat (rock features) not impacted.
<i>Martes pennanti pacifica</i> Pacific fisher	Ponderosa Pine	15.47	0.9%	May Affect, Not Likely to Adversely Affect. Although suitable foraging habitat for this species would be impacted by proposed actions, this species is sensitive to human presence and is not likely to utilize habitats in the Yosemite Lodge are.
<sup>a</sup> This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. SOURCE: NPS 2012c				

Construction of new facilities will require some tree removal. As noted in table 9-119, up to 15.47 acres of ponderosa pine habitat and 1.73 acres of montane hardwood habitat would be affected by the actions proposed for Yosemite Lodge and Camp 4 under Alternative 6. Removing mature conifer and hardwood trees, trees with cavities, or snags could affect bats or birds by removing suitable roosts or perches. Due to the proximity of this habitat to already developed sites as well as the structure and canopy closure of the stands that would be affected, it is not anticipated that any active nest sites for long-eared owls or spotted owls would be affected by the proposed actions. Tree removal would be minimized through site design however, and, if possible, older trees and snags would be retained for habitat. In addition, pre-construction surveys for these species would be conducted to ensure that no active nest sites would be affected.

The use of heavy equipment during construction could cause wildlife to relocate or avoid the area and could cause birds and mammals to avoid using the immediate area for foraging. Although the disturbance from construction activities would be temporary, displacement of individuals would have an adverse impact on local special status bird and bat populations. With the implementation of mitigation measures such as surveying suitable habitat prior to construction during the breeding season, noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these local, short-term impacts to minor and adverse.

It is unlikely that any special status plant species occur in the Yosemite Lodge and Camp 4 area due to the high levels of visitation and human-related impacts such as vegetation trampling and soil

compaction. In addition, no special status plants found during rare plant surveys conducted in 2010 at the Yosemite Lodge and Camp 4 area. Therefore, it is unlikely that special status plant species will be affected by actions to manage visitor use and facilities at Yosemite Lodge and Camp 4 under Alternative 6.

**Segment 2 Impact Summary:** Overall, actions in Segment 2 under Alternative 6 would result in segmentwide, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segment 2 under Alternative 6 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segment 2 under Alternative 6 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Segments 3 and 4: Merced Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Currently, vehicles park under the dripline of the 38 valley oak trees. This practice compacts soil under the trees, thus impacting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak seedlings can be recruited. Under Alternative 6, valley oaks in El Portal would be enhanced by creating an oak recruitment area of one acre in Old El Portal in the vicinity of the current bulk fuel storage area, including the adjacent parking lots. Parking and new building construction within the oak recruitment area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. The fuel storage area would be relocated outside of the river corridor. Overall, these actions would result in local, long-term, moderate, beneficial impacts on valley oaks in Segment 4. Valley oaks are a park-designated special status species.

These restorative actions could result in local, short-term, adverse impacts on special status wildlife within the adjacent riparian habitat, including noise associated with construction-related activities, ground disturbance, human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these restorative actions would restore the 100-year floodplain and associated riparian community, improve hydrological connectivity to the river, and improve habitat for riparian-dependent species.

As summarized in the “Wildlife” section earlier in this chapter, a total of 12 acres of montane riparian and valley oak woodland habitat would be restored in Segment 4 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. These actions would be expected to have a local, long-term, minor, beneficial impact on special status wildlife species that use riparian habitats in El Portal (WHR: montane

riparian). Special status wildlife species that may benefit from these actions over the long term include valley elderberry longhorn beetle, western pond turtle, long-eared owl, yellow warbler, and western red bat.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Actions in the El Portal area (Segment 4) include the restoration of the Greenemeyer sand pit and the restoration of riverside habitat in Abbieville and the Trailer Village. The NPS would avoid all impacts within 100-feet of elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level when implementing these common to all restoration actions. If these actions were to result in unanticipated direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce short-term impacts to minor and adverse. Overall, restoration actions would result in local, long-term, minor, beneficial impacts on special status plants that occur in riparian habitats in these areas.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 6, visitor day parking would be expanded by 200 parking spaces at Abbieville; this area would primarily be used for visitor access to Yosemite Valley. NPS employee housing would be added to Abbieville, El Portal Village Center, and Rancheria Flat along with a total of 467 employee parking spaces at these locations. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor in Segment 4. This increase in capacity in El Portal would be a function of the decrease in employee housing capacity in the Valley (Segment 2). The addition of employee housing and park facilities development would increase the total built environment within Segment 4.

Construction, removal, and restoration activities associated with these management actions could disturb special status wildlife habitat where facilities are removed and restored as well as where new facilities are constructed. Demolition or removal of existing buildings and associated infrastructure would generate noise and ground vibrations, disturb habitat, and create other disturbances associated with human presence.

The use of heavy equipment under Alternative 6 would create the potential for wildlife injuries or death, and could cause wildlife to relocate or avoid the area and could cause breeding birds to abandon their nests or avoid using the immediate area. New construction may require some tree removal; removing potentially occupied habitats such as mature conifer and hardwood trees, hollowed-out trees, or snags could affect breeding bats or birds by removing nests or roosts and could



result in the harassment of adults from active nests or roosting sites located in the vicinity. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. Although the disturbance would be temporary, species mortality, loss of reproductive potential, or abandonment of breeding sites would have an adverse impact on local special status bird and bat populations in particular. With the implementation of mitigation measures such as surveying potential habitat prior to construction (especially during important breeding seasons), noise and visual disturbances to special status wildlife would be minimized or avoided. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Biological resource surveys have identified suitable habitat (elderberry shrubs) in the El Portal area for valley elderberry longhorn beetle. Approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle occur in areas of potential development or management activities in El Portal. Valley elderberry longhorn beetle exit holes that verify beetle activity were found in 11 of these elderberry plants, though beetle larvae could still be present in elderberry plants without exit holes. Actions in Segment 4, including moving temporary housing units to El Portal and development at the Abbieville and Trailer Village, would result in potential indirect or direct impacts on elderberry shrubs, including removal of shrubs. Approximately 37 elderberry plants were documented within potential areas of ground disturbance, seven with exit holes. Complete impact avoidance would not be possible for these plants. The infill in El Portal would affect up to nine elderberry shrubs with stems greater than one inch in diameter. The development at Abbieville would affect up to 16 shrubs, while the development at Trailer Village would affect up to 12 shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. If these actions were to result in direct or indirect impacts on valley elderberry longhorn beetle habitat, the NPS would implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (mitigation measure MM-WL-4, as applicable; see Appendix C).

Vegetation removed under Alternative 6 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. The NPS would avoid special status plant species during construction activities.

**Segments 3 and 4 Impact Summary:** Overall, actions in Segments 3 and 4 under Alternative 6 would result in local, long-term, minor, beneficial impacts on most special status species.

Actions in Segments 3 and 4 under Alternative 6 would have no effect on the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Pacific fisher, Sierra Nevada bighorn sheep, and whitebark pine.

It is the determination of the NPS that the actions proposed in Segment 4 under Alternative 6 may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

## **Segments 5– 8: South Fork Merced River**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions specifically targeted to protect culturally sensitive areas in Segment 7 would also benefit special status species, including the relocation or removal of some campsites and stock campground sites within 100 feet of the river or in culturally sensitive areas. The removal of selected campsites within the floodplain would result in local, long-term, minor, beneficial impacts on special status species as riparian habitat is restored and wildlife are subject to less human presence and human-related pressures.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 7 under Alternative 6 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. Overall, this action would result in a local, long-term, minor, beneficial impact on special status species in Segment 7.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 6, Wawona stables operations would be eliminated and two stock campsites would be relocated to the stables area from the current Wawona stock camp. In the Wawona Campground, 13 campsites would be removed from within 100 feet of the South Fork Merced River or from cultural sites, and the area would be restored. Soils would be decompacted, and the area would be replanted with riparian vegetation. This would reduce visitor use in Segment 7, with a resulting decrease of vegetation trampling.

These actions would result in short-term, adverse impacts on special status wildlife that uses riparian habitat. Adverse impacts include noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to the South Fork Merced River. Adhering to proposed mitigation measure MM-WL-1 through MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these actions would reduce the built environment within Segment 7, restore riparian habitat, and reduce riverbank erosion.

As summarized in the “Wildlife” section of this chapter, a total of three acres of riparian habitat would be restored in Segment 7 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to wildlife that use this habitat type. Thus, this restoration action would be expected to have a local, long-term, moderate, beneficial impact on special status wildlife species that use riparian habitats in Segment 7 (WHR: montane riparian). Special status wildlife species that may benefit from these actions over the long-term include long-eared owl and yellow warbler.

Special status plants may be adversely affected in the short term by removal, restoration, and monitoring activities associated with these management actions. Potential impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. These impacts would be local. Adhering to proposed mitigation measure MM-WL-3, as applicable (see Appendix C), and avoiding the removal of

vegetation, where possible, would reduce these short-term impacts to minor and adverse. Overall, actions in Segment 7 under Alternative 6 would result in local, long-term, negligible, beneficial impacts on special status plants that occur in the Wawona area.

**Wawona Campground.** Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. Overall, these actions would result in a local, long-term, minor, beneficial impact on special status species in Wawona.

**Segments 5, 6, 7 and 8 Impact Summary:** Overall, actions in Segments 5-8 under Alternative 6 would result in local, long-term, minor to moderate, beneficial impacts on special status species.

Actions in Segments 5-8 under Alternative 6 would have no effect on the following federally listed and candidate species: valley elderberry longhorn beetle, Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, Sierra Nevada bighorn sheep, and whitebark pine.

Actions in Segments 5-8 under Alternative 6 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Pacific fisher.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Past development and human activity in the Merced River corridor have in some cases adversely affected special status species habitat and use of those habitats. As described in the preceding paragraphs, many of the actions under Alternative 6 would address existing adverse impacts on habitats for special status species, including actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent special status species where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to restore the ecological integrity of riparian, meadow, and aquatic habitat in targeted areas; increase channel free flow; improve water quality; and reduce erosion and scouring. Notable actions the park would implement under Alternative 6 include the following:

- Restrict recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment within the park; some facilities would be built to accommodate visitors or employees.
- Manage for an increase (4%) in total daily visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Remove selected facilities within 100 feet of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Generally, Alternative 6 would be focused on restoration of meadow, riparian, and riverbank habitats in Yosemite Valley (Segment 2); retaining most park facilities but removing selected facilities that are located within 100 feet of the river and are jeopardized by flooding; repurposing park facilities to improve efficiency of use; and providing adequate lodging, camping, and parking space for visitors and employees. Additionally, the park would continue to provide river access to visitors in designated areas, and continue to protect the river and riverbanks by requiring permits or limiting use of put-in areas. Alternative 6 would allow for an increase in total daily visitations to the park, and park infrastructures (lodging, camping space, and parking lots) would be retained or expanded in selected locations to accommodate increased demand. Adverse effects from these actions would be associated with the active construction or restoration phase and would be local, short term, and negligible to moderate, depending on the type of project and location. Although some habitat would be restored and fragmentation and indirect detriments to habitat would be reduced in selected areas, an increase in park visitors accompanied by continued operation of most park facilities and construction of new facilities would result in adverse impacts on special status species. When combined, the long-term effect of these measures would be a moderate, beneficial impact on special status species. These effects would be most prominent in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Overall, there would be a lessened potential for beneficial effects under Alternative 6 compared with Alternative 2 and a slightly lessened beneficial effect compared with Alternatives 3 and 4. However, there would be a somewhat increased potential for adverse impacts over Alternatives 2 and 3, and about the same adverse impact potential compared with Alternatives 4 and 5 because more new construction would occur in and adjacent to suitable special status species habitat.

Implementation of a comprehensive ecological restoration program to restore natural processes to the Merced River corridor, and extensive site-specific restoration, would result in a corridorwide, long-term, moderate, beneficial impact on special status species habitat. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river; enhance habitat complexity in riparian, meadow and aquatic areas; reduce human and pack-related disturbances; and reduce nonnative species and conifer intrusion into sensitive habitats. Adverse effects related to the construction phase of these actions would be local, short term, and minor or negligible.

Actions under Alternatives 6 would have no effect on the following federally listed and candidate species: Sierra Nevada bighorn sheep and whitebark pine.

Actions under Alternative 6 may affect, but would not be likely to adversely affect, the following federally listed and candidate species: Yosemite toad, Sierra Nevada yellow-legged frog, California wolverine, and Pacific fisher.

Actions in Segment 4 under Alternative 6 would result in potential indirect or direct impacts on elderberry shrubs, including possible removal of shrubs. Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in local, long-term, minor, adverse impacts on this beetle species. Therefore, it is the determination of the NPS that the actions proposed may affect, and are likely to adversely affect, the valley elderberry longhorn beetle.

**Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The past, present, and reasonably foreseeable plans and projects that could have a cumulative impact on special status species in combination with Alternative 6 are the same as those listed under Alternative 1 (No Action).

***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

The restoration actions associated with Alternative 6 would generally result in segmentwide, minor to long-term, moderate, beneficial impacts on special status species habitats within the Merced River corridor, with the exception of valley elderberry longhorn beetle. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, special status species that are associated with these habitat types are most likely to be affected cumulatively by the proposed actions. Actions that would retain current facilities or services and construct new facilities would generally contribute to adverse impacts on special status species in the river corridor over the long term. Because actions with Alternative 6 would allow for higher levels of total daily visitors to the park, more park facilities and services would be retained within the floodplain of the river. Additionally, new or extended parking spaces and campsites would be constructed to accommodate increase in visitor demand for day parking and camping opportunities. The past, present, and future actions in the region would have varying effects on special status species habitats, with some projects restoring or enhancing habitats, while many other projects would result in loss or decline.

In general, past actions have impaired and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations from development and resource extraction, have resulted in a reduction in special status species populations and ranges. Present and reasonably foreseeable future actions also have the potential to further reduce or impair these habitat types; however, in general, potential effects on these habitat types are mitigated and/or compensated through habitat preservation and/or enhancement at an off-site location (including mitigation banks). These actions provide the most benefit when coordinated with larger, regional conservation strategies that protect intact corridors or provide linkages to other areas of suitable habitat. Because the actions proposed under Alternative 6 would increase the habitat value of the Merced River corridor in certain areas and reduce habitat values in others, these actions would contribute towards a cumulative minor, adverse effect on special status species.

Special status species and their habitats have been manipulated by human development and population growth throughout the region for decades, and these actions have negatively influenced the populations and ranges of special status species. The cumulative effects of past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on special status species include habitat restoration, enhancement projects, and ecosystem management, generally carried out by federal, state, and local public agencies as well as privately owned and managed conservation lands, open space, and mitigation banks. Adverse cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Each of the aforementioned projects has the potential to have substantial

site-specific adverse effects on special status species during construction (short term) and by direct displacement of populations or habitat (long term).

The actions under Alternative 6 would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 6 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 6, cumulative actions on special status species would result in long-term, adverse effects on special status species.

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## Lightscapes

### *Affected Environment*

#### Scope of the Analysis

The National Park Service (NPS) defines lightscapes as “natural resources and values that exist in the absence of human-caused light” (NPS 2006). This section addresses the lightscape environment across the Merced River and South Fork Merced River corridors within Yosemite National Park. Particular attention is paid to existing sources of artificial lighting and their implications for the lightscape environment. River segments with similar types of developments and sources of lighting are discussed together.

#### Regulatory Framework

##### *NPS Management Policies 2006*

The *NPS Management Policies 2006* set forth specific measures overseen by the park superintendent for the preservation of natural lightscapes in an effort to “minimize light that emanates from park facilities, and also seek the cooperation of park visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the ecosystems of parks” (NPS 2006). These policies commit the NPS to protecting natural darkness and other components of natural lightscape within parks. To achieve the dual goal of providing for visitor safety and management of natural lightscapes, section 4.10 of the NPS management policies direct the park to:

- Restrict the use of artificial lighting in parks to those areas where security, basic human safety, and specific cultural resource requirements must be met.
- Use minimal-impact lighting techniques.
- Shield the use of artificial lighting where necessary to prevent the disruption of the night sky, natural cave processes, physiological processes of living organisms, and similar natural processes (NPS 2011c).

#### Overview

The national park system includes some of the few places where views of the night sky remain in-tact and relatively unimpeded by the glare of urban night lighting. The enjoyment and appreciation of these natural lightscapes depend on many factors, including the weather, the clarity of the air, and the amount of light pollution present. Light pollution is of particular concern in national parks; nearly every park in the national park system is affected by some level of artificial light in the night sky (DURISCOE 2005). Nationwide, the glare and “sky glow” from urban areas are encroaching on dark skies in areas normally considered remote, including within the Sierra Nevada region.

The NPS considers natural lightscapes as an intrinsic natural and cultural value of all parks; therefore, the protection of lightscapes has been added to the responsibilities of park managers. While natural

lightsapes are recognized as a critical component of ecological processes, the night sky is also considered a critical part of cultural heritage in national parks and, in at least one case, the night sky has been designated by a state legislature as an endangered historic resource (Rogers and Sovic 2001). In addition, night sky visibility is an important aesthetic component of wilderness values.

### **Measuring Dark Night Skies in Yosemite National Park**

In 2001, a model developed jointly by the NPS and the National Oceanic and Atmospheric Administration was used to evaluate the effects of light pollution on areas administered by the NPS for the purpose of protecting night sky visibility. This was a nationwide model that built upon previous efforts to distinguish the effects of artificial sky glow from cities and naturally occurring sky glow (e.g., moonlight). The results were calibrated by comparing the expected amount of light pollution for various locations with actual observations. According to the results of this model, about two-thirds of Yosemite National Park is at or near pristine conditions for dark night skies, while in the remaining one-third of the park, primarily the western portion, light pollution is affecting night sky quality (Albers and Duriscoe 2001).

The model was not calibrated to a level that would distinguish among segments of the Merced River corridor, but generally this would equate to near pristine conditions for the upper reaches of the river's main stem and the South Fork Merced River (i.e., Segments 1 and 5), with potential night-sky impacts detectable along the lower reaches (i.e., Segments 2, 3, 4, and 7 downstream). More localized data collection would be necessary to confirm the model's implications for the study area.

To effectively manage night skies as a resource in parks, the NPS Night Sky Team was formed in 2000 to measure and inventory night skies in parks across the nation. The Night Sky Team has developed a system for measuring sky brightness to quantify the source and severity of light pollution. This system, developed with assistance from professional astronomers and the International Dark-Sky Association, utilizes a research-grade digital camera to capture the entire sky with a series of images. Since the development of this system, inventories of night sky quality have been conducted at several parks; these night sky baseline assessments are intended to form the foundation for a monitoring program to detect long-term changes in the parks' lightscape environments.

In August and September 2005, the Night Sky Team took sky quality measurements in the park from Sentinel Dome, located west of Glacier Point on the rim of Yosemite Valley, and Pothole Dome, on the west end of Tuolumne Meadows. The results of visual observation and measurements indicate that artificial light seen from Sentinel Dome is significantly brighter than Pothole Dome. The Night Sky Team assessment indicated that sources of light pollution at both Sentinel Dome and Pothole Dome include Fresno, the Modesto/Stockton/Sacramento area, and the Reno/Carson City area. However, overall, the darkest park of the sky as viewed from Pothole Dome was observed to be "very dark," with near pristine conditions, while the darkest part of the sky at Sentinel Dome was 0.2–0.3 orders of magnitude brighter (DURISCOE 2005).

## Lighting Guidelines

While the majority of light pollution seen in national parks radiates from population centers outside park boundaries, the NPS recognizes that artificial lighting within parks may have a detrimental effect on natural lightscapes, as well. Yosemite National Park has worked with the park concessioner to develop, refine, and implement lighting guidelines for the park. These guidelines are intended to balance the safety and security of employees and visitors, universal accessibility, and the scientific and aesthetic importance of the natural lightscape that NPS is obligated to protect.

The focus of the current parkwide lighting guidelines includes Yosemite Valley and other heavily used portions of the park; there are no lighting guidelines specific to the Merced Wild and Scenic River corridor. These guidelines divide the park into nonwilderness areas, where visitor services are concentrated, and wilderness areas, which are managed and maintained as natural areas and visitors have to assume a certain degree of risk and responsibility for their own safety.

Nonwilderness areas, such as Yosemite Valley, El Portal, and Wawona, are lighted for safety, security, and accessibility in accordance with the following NPS principles: warrant light only where needed, control light only when needed, shield direct light downward, manage the light spectrum by selecting a lamp color that minimizes negative impacts, manage light intensity by using the minimum amount of light necessary, and ensure light efficiency by selecting the most energy efficacious lamp and fixture. In addition to these principles, the lighting guidelines apply effective use of good design in areas of development to minimize or eliminate light clutter.

In some wilderness areas, electric lighting may be used but only as determined necessary on a case-by-case basis by the NPS. Where artificial lighting is present, lighting guidelines are intended to prevent both light pollution and light trespass, primarily using structural means to control light and cast light downward, as noted in the light principles above. As a secondary measure, power limits (in the form of low lamp wattage) are set on all lamp types to minimize inadvertent light trespass or pollution. By applying these measures, light pollution, energy waste, and diminished visitor experience stemming from undesired light spillover would be prevented through proper NPS lightscape management (NPS 2011c).

## The Lightscape Environment within the Merced River Corridor

### *Segments 1, 5, and 8: Merced River Above Nevada Fall, and South Fork Merced River Above and Below Wawona*

Lightscapes in designated wilderness areas are dominated by natural sources of light and dark night skies. Within Segment 1, artificial lighting would be concentrated around the Little Yosemite Valley, Merced Lake Backpackers, and Moraine Dome campgrounds, as well the 60-unit Merced Lake High Sierra Camp. Campground lighting would generally include hand-held torches, lanterns, and campfires. Lighting sources around the Merced Lake High Sierra Camp would be similar to that of the campgrounds, with the additional glow of the camp's interior operational lighting. Similarly, hand-held torches, lanterns, and campfires tend to be the main sources of lighting in Segments 5 and 8, with the occasional flash of a vehicle headlight from a road or turnout within an adjacent nonwilderness area.

*Segment 3 and 6: Merced River Gorge and Wawona Impoundment*

In the Merced River Gorge and Wawona Impoundment areas (i.e., Segments 3 and 6), lightscapes are defined largely by natural sources and dark night skies. The main source of artificial night lighting within the gorge segment is from automobile headlights along Highway 140, and from the adjacent developed areas of El Portal and Yosemite Valley. At the impoundment, the only potentially detectable sources of night lighting are that of the community of Wawona and nearby Camp Wawona, described below, which are more than 0.5 mile away.

*Segments 2, 4, and 7: Yosemite Valley, El Portal, and Wawona*

Yosemite Valley, El Portal, and Wawona host the greatest concentrations of development within the park, and thus the greatest amount of artificial night lighting. Sources of light pollution within these areas include utility lamps, shaded pathway lights, spot and other exterior lights, illuminated signs, decorative architectural lights, the glow of interior lights, fluorescent service station signs, automobile headlights, and campfires. Within Segments 2, 4, and 7, lighting is most intense in existing developed areas. For example, within Segment 2, nighttime lighting is most visible within the housing and lodging areas of Curry Village, The Ahwahnee, and the Yosemite Lodge complex. Lighting within lesser developed areas, such as Housekeeping Camp and East Valley campgrounds, is also considerable, but less pronounced than in the aforementioned areas (NPS 2010e). More specific information about the facilities and infrastructure with which such lighting is associated include administrative and housing developments described in the “Park Operations and Facilities” section; the lodging units, campgrounds, and associated infrastructure described in the “Visitor Experience/Recreation” section; and the parking lots and vehicles on roadways described in the “Transportation” section.

*Environmental Consequences Methodology*

The lightscapes impact assessment evaluates how the plan would affect the dark night skies in the Merced River corridor. Impacts were evaluated in terms of their context, intensity, and duration, and whether the impacts were considered beneficial or adverse.

- **Context.** The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park or impacts specific to the Merced River corridor. In considering lightscape impacts, it is assumed that impacts would be consistently local.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts would be considered not detectable, with no discernible effect on the ambient lightscape environment. Minor impacts would be slightly detectable but not expected to have an overall effect on conditions. Moderate impacts would be clearly detectable and could have an appreciable effect. Major impacts would have a substantial, highly noticeable influence on the ambient lightscape environment.
- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration or transitory in effect, such as light from passing vehicles. A long-term impact would have a permanent effect on the ambient lightscape environment.

- **Type of Impact.** Impacts are evaluated in terms of whether they would be beneficial or adverse to the ambient lightscape environment. Beneficial impacts would reduce associated levels of light, while adverse impacts would have the opposite effect.

### ***Environmental Consequences of Alternative 1 (No Action)***

The lightscapes impact assessment involves the identification and qualitative description of the types and characteristics of actions proposed under each alternative that could affect the lightscape environment and dark night skies of the Merced River and South Fork Merced River corridors. The examination of effects is limited to sources of light within the park, focused on the location of facilities and operational features that produce light.

Although sky glow radiating from population centers on either side of the Sierra Nevada affects dark night skies in the river corridor, the plan alternatives would have no effect on the regional sources of this impact; therefore, this is not addressed as part of the environmental consequences of the plan. As stated under “Affected Environment,” above, sky glow is more evident in the lower reaches of the river corridor, closer to the major population centers in California. Growth in the region would be expected to increase this adverse effect on lightscapes in the river corridor.

The lightscapes impact assessment evaluates how changes resulting from the plan’s management measures would affect the dark night skies in the corridor. Impacts are evaluated in terms of their context, intensity, and duration, and whether the impacts would be beneficial or adverse. Alternative 1 (No Action) assumes the continuation of lightscape management under NPS *Management Policies 2006* and other existing policies that could influence lighting decisions. In addition, the park recently completed parkwide lighting guidelines, as described in the “Lighting Guidelines” subsection above, and is presently working with the park concessioner on their implementation. While new sources of lighting or modifications to existing sources could occur under Alternative 1 (No Action), none is proposed. However, through continued implementation of the Lighting Guidelines, NPS will improve the park’s dark night skies. Lightscapes within the corridor are and will continue to be influenced by the level of development within each river segment. As such, the following paragraphs analyze the implications of Alternative 1 on groups of segments with similar development and sources of lighting.

#### **Segments 1, 5, and 8: Merced River Above Nevada Fall, and South Fork Merced River Above and Below Wawona**

Lightscapes in designated wilderness areas (i.e., Segments 1, 5, and 8) would continue to be dominated by natural sources of light and dark night skies. Sources of night lighting within Segments 1, 5, and 8 would continue to include campfires and occasional vehicle headlights from adjacent, nonwilderness areas (primarily within the South Fork Merced River segments). Artificial lighting associated with operation of the Merced Lake High Sierra Camp and nearby wilderness campgrounds would also continue to affect the lightscape within Segment 1. There are no actions proposed under Alternative 1 that would explicitly affect lighting within Segments 1, 5, and 8. Overnight visitation within these wilderness areas would be expected to remain similar to that of present conditions. As a result, the long-term impacts of Alternative 1 on the lightscape environment within Segments 1, 5, and 8 would be local, negligible to minor, and adverse.

### **Segments 3 and 6: Merced River Gorge and Wawona Impoundment**

In the Merced River gorge and Wawona Impoundment areas (i.e., Segments 3 and 6), lightscape would continue to be defined by natural sources and dark night skies. The main source of artificial night lighting within the gorge would continue to be automobile headlights on Highway 140. At the impoundment, the potentially detectable sources of night lighting would continue to originate within Wawona and nearby Camp Wawona. Increased visitation could result in a relatively minor increase in transient night lighting from greater numbers of cars traveling through Segment 3, or from exterior safety lighting in Wawona, adjacent to Segment 6. However, nighttime visitation or development within these areas would not be expected to increase substantially with time. As a result, Alternative 1 would have a local, long-term, negligible, adverse effect on the lightscape environment within Segments 3 and 6.

### **Segments 2, 4, and 7: Yosemite Valley, El Portal, and Wawona**

Yosemite Valley, El Portal, and Wawona (i.e., Segments 2, 4, and 7) would continue to host the greatest concentration of development within the park, and thus the greatest amount of artificial night lighting. Sources of night lighting within these areas would continue to include utility lamps, bus stations, shaded pathway lights, spot and other exterior lights, illuminated signs, decorative architectural lights, the glow of interior lights, fluorescent service station signs, automobile headlights, and campfires. Within Segments 2, 4, and 7, such lighting would continue to be most intense around those existing developed areas, as described under “Affected Environment” above, including administrative and housing facilities, lodging and campground operations, and parking lots and roadways. No new substantial sources of night lighting are anticipated under Alternative 1. However, with increased visitation, potential sources of additional lighting within the park could include those associated with increased nighttime traffic and greater numbers of overnight campground visitors during nonpeak seasons. The long-term implications for the park’s lightscape environment in Segments 2, 4, and 7 would be local, negligible to minor, and adverse.

### **Summary of Alternative 1 (No Action) Impacts**

Lightscape in designated wilderness areas (i.e., Segments 1, 5, and 8) would not be expected to change over time under Alternative 1 (No Action). In-park sources of light pollution, including occasional campfires, vehicle headlights, and artificial lighting in Little Yosemite Valley and Merced Lake High Sierra Camp, would remain in these wilderness areas. In the areas between the wilderness and more developed areas (i.e., Segments 3 and 6), lightscape would continue to be characterized by near pristine conditions, similar to wilderness areas, but with occasional intrusion of night lighting from passing vehicles or nearby developments. In the more developed areas of the corridor (i.e., segments 2, 4, and 7), lightscape would continue to be shaped by local artificial lighting along roads, housing and administrative facilities, and visitor service areas. The continuation of present visitation trends, and the associated increased nighttime traffic and overnight campground visitors during nonpeak seasons could result in an increase in parkwide night lighting, especially in areas of existing development. As a result, implementation of Alternative 1 could have local, long-term, negligible to minor, adverse impacts on lightscape within the nonwilderness segments of the Merced River and South Fork Merced River corridors.

## ***Environmental Consequences of Actions Common to Alternatives 2–6***

### **Segments 3 and 6: Merced River Gorge and Wawona Impoundment**

There are no actions proposed for Alternatives 2–6, or any individual alternative, that would impact the lightscape environment within Segments 3 and 6. As a result, these segments are not discussed further within this section.

### **Segments 2, 4, and 7: Yosemite Valley, El Portal, and Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, the park would remove from Segment 2 all campsites within the 100-year floodplain. The park would also remove campsite 208 sites at Upper Pines Campground. These actions would have a local, long-term, negligible, beneficial impact on park lightscares as the sources of night lighting associated with these sites (e.g., campsite facilities, campfires, vehicle headlights, camping lanterns) would be removed or relocated away from the center of the Merced River corridor.

The park would also remove from Segment 7 a total of seven campsites from the area around archeological site CA-MRP-168/329/H (A.E. Wood Campground). For the same reasons noted for Segment 2, these actions would have a local, long-term, negligible, beneficial impact on park lightscares.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor use management and facilities actions that could affect Yosemite Valley lightscares stem from changes to employee housing, camping, parking, and administrative facilities. The lightscape environment of the East Valley and The Ahwanhee would be affected through increased overnight visitation and associated vehicle headlights at new campsites west of Backpackers Campground (16) and east of Camp 4 (40), and an expanded parking area at The Ahwahnee. As shown in **table 9-120**, a net reduction in Curry Village housing, including the removal of temporary housing at Huff House and Boys Town, would substantially reduce sources of artificial lighting in these areas.

Expanded parking at Curry Village could increase artificial lighting through overhead lighting and/or from the headlights of greater numbers of vehicles within the area after sunset. Removal of the Village Garage, Concessioner General Offices, and Arts and Activities Center would improve the valley's lightscape environment, particularly in the vicinity of Yosemite Village. Within the Yosemite Lodge area, the construction of a new parking lot and expansion of campgrounds would increase nighttime lighting associated with these facilities. However, the lightscape environment in these areas would also be improved through elimination of housing at Highland Court and the 1,000s cabins, as well as the NPS Volunteer Office and post office.

Under Alternatives 2–6, the park would also construct infill housing units within the Rancheria area of Segment 4. These structures would affect park lightscares in the vicinity of El Portal Village. In Wawona, the park would develop new facilities to house roads, maintenance, and fire-fighting operations. These facilities would be constructed in the area of the existing Maintenance Yard and have an adverse impact on the lightscape environment in this area.



**TABLE 9-120: ALTERNATIVES 2-6 – CONCESSIONER EMPLOYEE HOUSING**

	Residential Units Removed	New Residential Units	Total Change in Residential Units
Curry Village	310	164	-146
Yosemite Lodge	90	0	-90
<b>Total Yosemite Valley</b>	<b>400</b>	<b>164</b>	<b>-236</b>
Rancheria	0	12	12
<b>Total El Portal</b>	<b>0</b>	<b>12</b>	<b>12</b>

Removal of administrative and visitor-serving facilities, campsites, and temporary housing would eliminate from the corridor numerous sources of nighttime lighting, specifically those associated with residential and administrative structures, and to a lesser extent, campgrounds. These actions would result in a net reduction in nighttime lighting and a corresponding long-term, negligible to minor, beneficial impact on the Merced River corridor's lightscape environment. Construction of new facilities would have a detrimental effect on park lightscapes, mainly in the areas of the Yosemite Lodge, El Portal, and the Wawona Maintenance Yard. However, because these areas are already somewhat developed, and any new or modified exterior lighting fixtures would be required to comply with the park's lighting guidelines and nighttime construction restrictions — incorporated by reference herein as mitigation measures MM-LITE-1 and -2 (see Appendix C) — the impact of these actions in Segments 2, 4, and 7 would be local, long-term, negligible to minor, and adverse.

### Summary of Impacts Common to Alternatives 2–6

The removal of campsites, commercial visitor-serving facilities, and temporary employee housing would result in a beneficial impact on the lightscape environment, as these actions would remove human-caused sources of lighting from the Merced River corridor. The construction of new employee housing within Segments 2 and 4, and new administrative facilities in Segment 7, would introduce new sources of artificial lighting into these areas. However, due to the scale of these activities, and with mitigation measures implemented, the overall impact on park lightscapes would be local, negligible, and beneficial.

### *Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration*

#### Segment 1: Merced River Above Nevada Fall

##### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 25). This could improve the lightscape environment within Segment 1 by limiting the number of overnight visitors to the area, thereby reducing potential sources of artificial night lighting associated with that type of use (e.g., campfires). In addition, removal of the Merced Lake High Sierra Camp would eliminate sources of nighttime lighting in the vicinity of the camp,

including those associated with operation of the camp, such as fixtures around common areas and the exterior glow of internal lighting. Modifications to existing campgrounds would result in a further reduction in overnight visitation within Segment 1. As with removal of the Merced Lake High Sierra Camp, such modifications would result in a corresponding decrease in sources of nighttime lighting within these areas of Segment 1. The associated impact on the lightscape environment of Segment 1 would be local, long-term, minor, and beneficial.

**Segment 1 Impact Summary:** Actions to Manage user capacity, land use, and facilities would have a local, long-term, minor, beneficial impact on the lightscape environment of Segment 1.

## **Segments 2, 4, and 7: Yosemite Valley, El Portal, and Wawona**

### ***Impacts of Actions to Protect and Enhance River Values***

Specific Alternative 2 restoration projects that would occur within Segment 2 and have the potential to affect the Merced River corridor's lightscape environment include removal of portions of Northside Drive and Southside Drive. Road removal would have a beneficial impact on the park's lightscape environment within the vicinity of Ahwahnee and Stoneman meadows, as associated vehicle headlight impacts would be eliminated. However, the rerouting of traffic onto other roads would increase the incidence of vehicle-related night lighting along existing roadways that already experience such impacts. In the short-term, local, negligible, adverse impacts in Segment 2 may result from increased nighttime lighting of these construction areas to ensure safety. The long-term net effect of these projects would be local, negligible, and beneficial.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 2, specifically those concerning vehicle access and the number of overnight accommodations, would contribute to a 26% reduction in overnight visitation within the Yosemite Valley. As discussed in the context of specific management actions below, this reduction would effect a decrease in valley-wide nighttime lighting through the corresponding reduction in vehicles, lighted parking lots and lodging units and facilities to serve after-hours and overnight park visitors.

As shown in **table 9-121**, a substantial number of campsites would be relocated within Segment 2. These modifications would increase sources of nighttime lighting, such as campfires and vehicle lighting in some areas (i.e., Yosemite Lodge and Camp 4 areas), while decreasing it in others (i.e., Lower Pines, North Pines, Upper Pines, and Backpackers Campgrounds). Despite these adjustments, the total reduction in the number of campsites within Segment 2 would still be nominal and not have an appreciable effect on the lightscape environment within Segment 2.

As discussed in *Environmental Consequences of Actions Common to Alternatives 2–6*, and shown in **table 9-122** the lightscape environment within Segment 2 would benefit from a substantial reduction in housing at Curry Village and the Yosemite Lodge areas, and Tacoya Dorms, among others, by eliminating the exterior glow of interior lighting, the need for outdoor lighting, and reduced vehicle traffic.

**TABLE 9-121: ALTERNATIVE 2 CAMPGROUND MODIFICATIONS**

Location	Campsites (Alternative 2)	Campsites (Alternative 1)	Change from Alternative 1
Yosemite Lodge and Camp 4 Areas	174	35	139
Former Upper & Lower River Campground Areas	0	0	0
Boys Town and Upper Pines Campground Areas	216	240	-24
Lower Pines Campground Area	44	76	-32
North Pines and Backpackers Campgrounds and Curry Village Stables Areas	16	111	-95
Eagle Creek and Yellow Pine Administrative Campgrounds	0	4	-4
<b>Yosemite Valley Totals<sup>a</sup></b>	<b>450</b>	<b>466</b>	<b>-16</b>
Wawona	67	99	-32
<b>Wawona Total</b>	<b>67</b>	<b>99</b>	<b>-32</b>

**TABLE 9-122: ALTERNATIVE 2 CONCESSIONER EMPLOYEE HOUSING AND VISITOR LODGING**

Location	Total Residential Units under Alternative 2	Change in Residential Units from Alternative 1	Total Visitor Lodging Units under Alternative 2	Change in Visitor Lodging Units from Alternative 1
Yosemite Village	65	-366	0	0
The Ahwahnee	42	-6	123	0
Curry Village	387	-195	433	33
Yosemite Lodge	0	-90	0	-245
Housekeeping Camp	0	0	0	-266
<b>Total Yosemite Valley<sup>a</sup></b>	<b>494</b>	<b>-657</b>	<b>556</b>	<b>-494</b>
Rancheria	116	9	n/a	n/a
El Portal Village	92	12	n/a	n/a
Abbieville/Trailer Village	410	405	n/a	n/a
<b>Total El Portal<sup>b</sup></b>	<b>618</b>	<b>426</b>	<b>n/a</b>	<b>n/a</b>

<sup>a</sup> Totals include the 236 residential units that would be removed from the Curry Village and Yosemite Lodge areas of Segment 2 under actions common to Alternatives 2-6.

<sup>b</sup> Totals include the 12 residential units that would be constructed in the El Portal Village area of Segment 4 under actions common to Alternatives 2-6.

Construction of 78 new hard-sided cabins at Curry Village would increase sources of artificial lighting within the Boys Town area, but these impacts would be more than offset from the reduction in housing within this area. Removal of all lodging and facilities from Housekeeping Camp would further reduce artificial lighting within the valley, including the interior cabin lighting, vehicle headlights, and campfires associated with this operation. Conversion of the Yosemite Lodge to day use, despite the proposed

increase in camping and parking within this area, would also improve the natural lightscape environment through elimination of lighting associated with these structures and reduced overnight visitation.

Some of this work, specifically in the vicinity of Housekeeping Camp, Curry Village, Yosemite Village, and Yosemite Lodge – where large numbers of structures would be removed – may require a short-term increase in nighttime lighting of the construction areas to ensure safety. However, over the long-term, the impact on the Segment 2 lightscape environment would be local, major, and beneficial.

Under Alternative 2, the park would construct new housing for 405 employees within the Abbieville area of Segment 4. This project would contribute to area lightscape impacts through an increase in exterior lighting, the glow of interior lighting, and increased vehicle traffic. However, any new or modified exterior lighting would be required to comply with the park's lighting guidelines and nighttime construction restrictions, incorporated by reference herein as mitigation measures MM-LITE-1 and -2 (see Appendix C). With mitigation, the long-term impact on Segment 4 would be local, moderate, and adverse. Within Segment 7, the Wawona stables would be removed and 32 campsites eliminated from the Wawona Campground. The corresponding reduction in overnight visitation within these areas would reduce lightscape impacts. The long-term impact on Segment 7 would be local, negligible, and beneficial.

**Segments 2, 4, and 7 Impact Summary:** Actions to manage user capacity, land use, and facilities would have local, long-term, beneficial impacts on the lightscape environment, ranging from minor to moderate in Segments 2 and 7, and moderate adverse in Segment 4.

### **Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Lightscape impacts associated with Alternative 2 management measures would result mainly from changes in park visitation, facilities serving overnight visitors, and employee housing, and generally be limited to Segments 2 and 4. The collective effect of Alternative 2 management actions would cause overnight visitation within the park to decrease. Under Alternative 2, a considerable number of housing and lodging units, as well as visitor-serving facilities, would be removed from Yosemite Valley. The lightscape environment within El Portal would be further affected through the construction of a substantial amount of new employee housing. Nonetheless, overall, existing, and potential future sources of human-caused lighting would be expected to decrease under Alternative 2, resulting in an overall improvement of the park's lightscape environment. For these reasons, the long-term impacts of Alternative 2 on the park's lightscape environment would be local, minor to moderate, and beneficial.

### **Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Cumulative effects on the park's lightscape environment discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Merced and South Fork Merced River corridors, in combination with potential effects of actions common to Alternatives 2-6 and those specific to Alternative 2. The projects identified below include only those projects that could affect

park lightscapes within or in the vicinity of the Merced River corridor. Each project is described more fully in Appendix B.

### ***Past Actions***

The following is a list of cumulatively considerable past actions concerning park lightscapes:

- Cascades Housing Removal reduced artificial lighting by eliminating five housing units.
- Removal of housing units as a result of the 1997 flood reduced artificial lighting.
- Curry Village Employee Housing: the construction of 217 new housing units at Curry Village for flood-displaced employees increased artificial lighting.
- Closure of Curry Village units due to rockfall hazard reduced artificial lighting.
- Construction of temporary housing at the Curry Village Huff House for 102 rockfall-displaced employees increased artificial lighting.
- Construction of six temporary housing units at Yosemite Valley Lost Arrow complex for rockfall-displaced employees increased artificial lighting.
- Construction of 12 temporary housing units at The Ahwahnee for rockfall-displaced employees increased artificial lighting.

### ***Present Actions***

The following is a list of cumulatively considerable present actions concerning park lightscapes:

- Completion of the *Mariposa County General Plan* “Housing Element Update” may contribute to increased night lighting if it provides for additional development in the region.
- Implementation of the Yosemite Lighting Guidelines would reduce the impacts of artificial night lighting.
- Relocation of 40 park staff from offices in El Portal to Mariposa may reduce artificial lighting in El Portal.
- Permanent removal of Curry Village units within the rockfall hazard zone (noted above) would permanently reduce artificial night lighting.
- Development of a new Wauhoga Indian Cultural Center would increase artificial night lighting.

### ***Reasonably Foreseeable Future Actions***

The following is a list of cumulatively considerable, reasonably foreseeable future actions concerning park lightscapes:

- Development of the new concessioner prospectus could increase or decrease artificial night lighting, depending upon its terms.

### ***Overall Cumulative Impact***

There are no anticipated development projects outside of those described herein that would contribute to light pollution within the park. Past actions, specifically the construction of housing for employees previously residing in hazard prone areas within Yosemite Valley, have slightly increased the amount of artificial lighting within the park. Present actions may result in regional increases in night-sky impacts, and the introduction of a few new individual sources of lighting within the park, but a continued overall reduction in the impacts associated with in-park lighting. As a result, when combined with the impacts of past and present actions, including those originating from outside the park, the cumulative effect of actions common to Alternatives 2-6 and those specific to Alternative 2 would be local, long-term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 75). This could improve the lightscape environment within Segment 1 by limiting the number of overnight visitors to the area, thereby reducing potential sources of artificial night lighting associated with that type of use (e.g., campfires). In addition, removal of the Merced Lake High Sierra Camp would eliminate sources of nighttime lighting in the vicinity of the camp, including those associated with operation of the camp, such as fixtures around common areas and the exterior glow of internal lighting. Modifications to existing campgrounds would result in a further reduction in overnight visitation within Segment 1. As with removal of the Merced Lake High Sierra Camp, such modifications would result in a corresponding decrease in sources of nighttime lighting within these areas of Segment 1. The associated impact on the lightscape environment within Segment 1 would be local, long-term, minor, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacity, land use, and facilities would have a local, long-term, minor, beneficial impact on the lightscape environment of Segment 1.

#### **Segments 2, 4, and 7: Yosemite Valley, El Portal, and Wawona**

##### ***Impacts of Actions to Protect and Enhance River Values***

Specific Alternative 3 restoration projects that would occur within Segment 2 and have the potential to affect the Merced River corridor's lightscape environment include removal of portions of Northside Drive and Southside Drive. Road removal would have a beneficial impact on the park's lightscape environment within the vicinity of Ahwahnee and Stoneman meadows, as associated vehicle headlight impacts would be eliminated. However, the rerouting of traffic onto other roads would increase the incidence of vehicle-related night lighting along existing roadways that already experience such impacts. In the short-term, local, negligible, adverse impacts in Segment 2 may occur from increased in

nighttime lighting of these construction areas, if necessary to ensure safety. However, the long-term net effect of these projects would be local, negligible, and beneficial.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 3, specifically those concerning vehicle access and number of overnight accommodations, would contribute to a 23% reduction in overnight visitation within Yosemite Valley. As discussed in the context of specific management actions below, this reduction would affect a decrease in valley-wide nighttime lighting through the corresponding reduction in vehicles, lighted parking lots, lodging units, and facilities to serve after-hours and overnight park visitors.

As shown in **table 9-123**, a considerable number of campsites would be relocated within Segment 2. These modifications would increase sources of nighttime lighting, such as campfires and vehicle lighting in some areas (i.e., Camp 4 area), while decreasing it in others (i.e., Lower Pines, Upper Pines, North Pines, and Backpackers Campgrounds). Despite these adjustments, the total increase in the number of campsites within Segment 2 would still be nominal and not have an appreciable effect on the lightscape environment within Segment 2.

**TABLE 9-123: ALTERNATIVE 3 CAMPGROUND MODIFICATIONS**

	Campsites (Alternative 3)	Campsites (Alternative 1)	Change from Alternative 1
Yosemite Lodge and Camp 4 Areas	70	35	35
Former Upper & Lower River Campground Areas	0	0	0
Boys Town and Upper Pines Campground Areas	274	240	34
Lower Pines Campground Area	61	76	-15
North Pines and Backpackers Campgrounds and Curry Village Stables Areas	68	111	-43
Eagle Creek and Yellow Pine Administrative Campgrounds	4	4	0
<b>Yosemite Valley Totals<sup>a</sup></b>	<b>477</b>	<b>466</b>	<b>11</b>
Wawona	72	99	-27
<b>Wawona Total</b>	<b>72</b>	<b>99</b>	<b>-27</b>
<sup>a</sup> Totals include the construction of 16 new sites near Backpackers Campground and 40 new sites near Camp 4 area under actions common to Alternatives 2-6.			

As discussed in *Environmental Consequences of Actions Common to Alternatives 2–6*, and shown in **table 9-124**, the lightscape environment within Segment 2 would benefit from a substantial reduction in housing at Curry Village and the Yosemite Lodge areas. The lightscape environment within Segment 2 would also benefit from the removal of a notable number of housing units from the Yosemite Village area, including the Lost Arrow Cabins, among others, by eliminating the exterior glow of interior lighting, the need for outdoor lighting, and reduced vehicle traffic.



**TABLE 9-124: ALTERNATIVE 3 CONCESSIONER EMPLOYEE HOUSING AND VISITOR LODGING**

Location	Total Residential Units in Alternative 3	Change in Residential Units from Alternative 1	Total Visitor Lodging Units in Alternative 3	Change in Visitor Lodging Units from Alternative 1
Yosemite Village	340	-91	n/a	n/a
Ahwahnee hotel	42	-6	123	0
Curry Village	436	-146	355	-45
Yosemite Lodge	104	14	143	-102
Housekeeping Camp	n/a	n/a	0	-266
<b>Total Yosemite Valley<sup>a</sup></b>	<b>922</b>	<b>-229</b>	<b>621</b>	<b>-413</b>
Rancheria	126	19	n/a	n/a
El Portal Village	92	12	n/a	n/a
Abbieville	0	0	n/a	n/a
<b>Total El Portal<sup>b</sup></b>	<b>218</b>	<b>31</b>	<b>n/a</b>	<b>n/a</b>
<p><sup>a</sup> Totals include the 236 residential units that would be removed from the Curry Village and Yosemite Lodge areas of Segment 2 under actions common to Alternatives 2-6.</p> <p><sup>b</sup> Totals include the 12 residential units that would be constructed in the El Portal Village area of Segment 4 under actions common to Alternatives 2-6.</p>				

Removal of all lodging and most facilities from Housekeeping Camp, and several guest units from Curry Village, would further reduce artificial lighting within the valley, including the interior cabin lighting, vehicle headlights, and campfires associated with this facility. With reduced operation of the Yosemite Lodge and new employee housing and parking in its vicinity, lighting impacts in this area of Segment 2 would remain similar to those of Alternative 1 (No Action).

Some of this work, specifically in the vicinity of Housekeeping Camp, Yosemite Village, and Yosemite Lodge – where large numbers of structures would be removed and/or constructed – may require a short-term increase in nighttime lighting of the construction areas to ensure safety. However, over the long-term, the impact on the Segment 2 lightscape environment would be local, moderate, and beneficial.

Under Alternative 3, the park would construct new housing for 19 employees within the Rancheria area of Segment 4. This project would contribute to area lightscape impacts through an increase in exterior lighting, the glow of interior lighting, and increased vehicle traffic. However, any new or modified exterior lighting would be required to comply with the park's lighting guidelines and nighttime construction restrictions, incorporated by reference herein as mitigation measures MM-LITE-1 and -2 (see Appendix C). With mitigation, the long-term impact on Segment 4 would be local, minor, and adverse. Within Segment 7, the Wawona stables would be removed and 27 campsites eliminated from the Wawona Campground. The corresponding reduction in overnight visitation within these areas would reduce lightscape impacts. The long-term impact on Segment 7 would be local, negligible, and beneficial.

**Segments 2, 4, and 7 Impact Summary:** Actions to manage user capacity, land use, and facilities would have local, long-term, beneficial impacts on the lightscape environment, ranging from minor to moderate in Segments 2 and 7, and minor adverse in Segment 4.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Lightscape impacts associated with Alternative 3 management measures would result mainly from changes in park visitation, facilities serving overnight visitors, and employee housing, and generally be limited to Segment 2. The collective effect of Alternative 3 management actions would cause overnight visitation within the park to decrease. A considerable number of lodging units would be removed from the valley under Alternative 3, while some new employee housing would be developed in relative proximity to existing developed areas of the valley and El Portal. As a result, it is expected that existing and potential future sources of human-caused lighting would decrease, resulting in an overall beneficial impact on the park's lightscape environment. For these reasons, the long-term impact of Alternative 3 measures on the park's lightscape environment would be local, minor to moderate, and beneficial.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

#### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

There are no anticipated development projects outside of those described herein that would contribute to light pollution within the park. As a result, when combined with the impacts of past and present actions, including those originating from outside the park, the cumulative effect of actions common to Alternatives 2-6 and those specific to Alternative 3 would be local, long-term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 100). This could improve the lightscape environment within Segment 1 by limiting the number of overnight visitors to the area, thereby reducing potential sources of artificial night lighting associated with that type of use (e.g., campfires). With designated camping only slightly reduced, and with retention of several campground facilities, sources of artificial lighting would remain concentrated within these areas of Segment 1. However, the removal and conversion of the Merced Lake High Sierra Camp would eliminate a considerable amount of nighttime lighting in the vicinity of the camp, specifically that associated with operation of the camp, such as fixtures around

common areas and the exterior glow of internal lighting. The resulting impact on the lightscape environment within Segment 1 would be local, long-term, minor, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacity, land use, and facilities would have a local, long-term, minor, beneficial impact on the lightscape environment of Segment 1.

## **Segments 2, 4, and 7, Yosemite Valley, El Portal, and Wawona**

### *Impacts of Actions to Protect and Enhance River Values*

Specific Alternative 4 restoration projects that would occur within Segment 2 and have the potential to affect the Merced River corridor's lightscape environment include removal of portions of Southside Drive and campsites from the 150-year floodplain. Road removal would have a beneficial impact on the park's lightscape environment within the vicinity of Stoneman Meadow, as associated vehicle headlight impacts would be eliminated. However, the rerouting of traffic onto other roads would increase the incidence of vehicle-related night lighting along existing roadways that already experience such impacts. In the short-term, local, negligible, adverse impacts in Segment 2 may occur from increased nighttime lighting of road construction areas, if necessary to ensure safety. However, the long-term net effect of these projects would be local, negligible, and beneficial.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Actions to manage visitor use and facilities under Alternative 4, specifically those concerning vehicle access and number of overnight accommodations, would contribute to a 7% increase in overnight visitation within Yosemite Valley. As discussed in the context of specific management actions below, this growth would cause an increase in valley-wide nighttime lighting through the corresponding increase in vehicles, lighted parking lots, lodging units, and facilities to serve after-hours and overnight park visitors.

As shown in **table 9-125**, a substantial number of campsites would be added within Segment 2. These additions would increase sources of nighttime lighting, such as campfires and vehicle lighting in several areas, including the Former Upper and Lower River Campground areas, and Boys Town and Upper Pines Campground areas. This increase would offset lightscape benefits resulting from removal of campsites from Backpackers, Lower Pines, and North Pines campgrounds. The net effect of these changes to the lightscape environment within Segment 2 would be long-term, local, minor, and adverse.

As discussed in *Environmental Consequences of Actions Common to Alternatives 2–6*, and shown in **table 9-126**, the lightscape environment within Segment 2 would benefit from a substantial reduction in housing at Curry Village and the Yosemite Lodge areas. The lightscape environment within Segment 2 would also benefit from the removal of a considerable amount of housing from the Yosemite Village area, including the Lost Arrow Cabins, among others, by eliminating the exterior glow of interior lighting, the need for outdoor lighting, and reduced vehicle traffic. However, some of the lightscape benefits of these actions would be offset by the construction of new housing in the vicinity of Yosemite Village.

**TABLE 9-125: ALTERNATIVE 4 CAMPGROUND MODIFICATIONS**

	Campsites (Alternative 4)	Campsites (Alternative 1)	Change from Alternative 1
Yosemite Lodge and Camp 4 Areas	90	35	55
Former Upper & Lower River Campground Areas	72	0	72
Boys Town and Upper Pines Campground Areas	365	240	125
Lower Pines Campground Area	61	76	-15
North Pines and Backpackers Campgrounds and Curry Village Stables Areas	109	111	-2
Eagle Creek and Yellow Pine Administrative Campgrounds	4	4	0
<b>Yosemite Valley Totals<sup>a</sup></b>	<b>701</b>	<b>466</b>	<b>235</b>
Wawona	69	99	-30
<b>Wawona Total</b>	<b>69</b>	<b>99</b>	<b>-30</b>
<sup>a</sup> Totals include the construction of 16 new sites near Backpackers Campground and 40 new sites near Camp 4 area under actions common to Alternatives 2-6.			

**TABLE 9-126: ALTERNATIVE 4 CONCESSIONER EMPLOYEE HOUSING AND VISITOR LODGING**

	Total Residential Units in Alternative 4	Change in Residential Units from Alternative 1	Total Visitor Lodging Units in Alternative 4	Change in Visitor Lodging Units from Alternative 1
Yosemite Village	390	-41	0	0
Ahwahnee hotel	42	-6	123	0
Curry Village	387	-195	355	-45
Yosemite Lodge	104	14	245	0
Housekeeping Camp	n/a	n/a	100	-166
<b>Total Yosemite Valley<sup>a</sup></b>	<b>923</b>	<b>-228</b>	<b>823</b>	<b>-211</b>
Rancheria	203	96	n/a	n/a
El Portal Village	92	12	n/a	n/a
Abbieville	0	0	n/a	n/a
<b>Total El Portal<sup>b</sup></b>	<b>295</b>	<b>108</b>	<b>n/a</b>	<b>n/a</b>
<sup>a</sup> Totals include the 236 residential units that would be removed from the Curry Village and Yosemite Lodge areas of Segment 2 under actions common to Alternatives 2-6.				
<sup>b</sup> Totals include the 12 residential units that would be constructed in the El Portal Village area of Segment 4 under actions common to Alternatives 2-6.				

Removal of 166 lodging units and some facilities from Housekeeping Camp would eliminate a substantial amount of artificial lighting within the valley, including the interior cabin lighting, vehicle headlights, and campfires associated with this facility. Expanded parking at Camp 6 could increase artificial lighting through overhead lighting and/or from the headlights of greater numbers of vehicles departing the area after sunset. With continued operation of Yosemite Lodge and new campgrounds

and parking in its vicinity, lighting impacts in this area would also increase, mainly due to the increase in vehicles and camping-related nighttime activities. However, over the long-term, the impact of these actions on Segment 2 lightscapes would be local, minor, and beneficial.

Under Alternative 4, the park would construct new housing for 96 employees within the Rancheria area of Segment 4. This project would contribute to area lightscape impacts through an increase in exterior lighting, the glow of interior lighting, and increased vehicle traffic. However, any new or modified exterior lighting would be required to comply with the park's lighting guidelines and nighttime construction restrictions, incorporated by reference herein as mitigation measures MM-LITE-1 and -2 (see Appendix C). With mitigation, the long-term impact on Segment 4 would be local, minor to moderate, and adverse. Within Segment 7, the Wawona stables would be removed and 27 campsites eliminated from the Wawona Campground. The corresponding reduction in overnight visitation within these areas would reduce lightscape impacts. The long-term impact on Segment 7 would be local, negligible, and beneficial.

**Segments 2, 4, and 7 Impact Summary:** Actions to manage user capacity, land use, and facilities would have local, long-term, beneficial impacts on the lightscape environment, ranging from negligible to minor in Segments 2 and 7, and adverse impacts ranging from minor to moderate in Segment 4.

#### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Lightscape impacts associated with Alternative 4 management measures would result mainly from changes in park visitation and facilities serving overnight visitors, and employee housing, and generally be limited to Segments 2 and 4. The collective effect of Alternative 4 management actions would cause overnight visitation within the park to increase slightly. However, because of the shift in type and location of overnight accommodations within the park (i.e., campgrounds near existing developed areas of the park), the impacts associated with that visitation are expected to be negligible. Under Alternative 4, a considerable number of additional lodging units would be removed from the park, while some new facilities would also be developed in relative proximity to existing developed areas of the valley. The lightscape environment within El Portal would be further affected by the construction of a considerable amount of new employee housing. Taken together, it is expected that existing and potential future sources of human-caused lighting throughout the Merced River corridor would remain similar to Alternative 1 or decrease slightly, resulting in an overall long-term, local, minor, beneficial impact on the park's lightscape environment.

#### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

##### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

There are no anticipated development projects outside of those described here that would contribute to light pollution within the park. As a result, when combined with the impacts of past, present, and reasonably foreseeable actions, including those originating from outside the park, the cumulative long-

term effect of actions common to Alternatives 2-6 and those specific to Alternative 4 would be local minor, and beneficial.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would not be expected to change appreciably under Alternative 5; wilderness access quotas would remain as under Alternative 1 and modifications to overnight accommodations would be nominal. As such, potential sources of artificial night lighting associated with overnight wilderness visitation would continue. Similarly, with designated camping unchanged, and with retention of several campground facilities, sources of artificial lighting (e.g., campfires) would remain concentrated within these areas of the Merced River corridor's wilderness. Reduction in the number of units at the Merced Lake High Sierra Camp would reduce slightly the amount of artificial lighting in the vicinity of the camp, specifically that of interior cabin lighting fixtures. The resulting long-term impact on the lightscape environment within Segment 1 would be local, negligible, and beneficial.

Segment 1 Impact Summary: Actions to Manage user capacity, land use, and facilities would have a long-term, negligible, beneficial impact on the lightscape environment of Segment 1.

#### **Segments 2, 4, and 7: Yosemite Valley, El Portal, and Wawona**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 5, namely those concerning vehicle access and number of overnight accommodations, would contribute to an 16% increase in overnight visitation within Yosemite Valley. As discussed in the context of specific management actions below, this growth would result in an increase in valley-wide nighttime lighting through the corresponding shift in vehicle headlights, lighted parking lots, lighted lodging units, and other facilities to serve after-hours and overnight park visitors.

As shown in **table 9-127**, a considerable number of campsites would be added within Segment 2 under Alternative 5. These additions would increase sources of nighttime lighting, such as campfires and vehicle lighting in several areas, including the Former Upper River, Upper Pines, and Eagle Creek Campground areas. This increase would offset lightscape benefits resulting from removal of campsites from Backpackers, Lower Pines, and North Pines campgrounds. The net effect of these changes to the lightscape environment within Segment 2 would be long-term, local, minor, and adverse.

**TABLE 9-127: ALTERNATIVE 5 CAMPGROUND MODIFICATIONS**

	Campsites (Alternative 5)	Campsites (Alternative 1)	Change from Alternative 1
Yosemite Lodge and Camp 4 Areas	70	35	35
Former Upper River Campground Area	30	0	30
Boys Town and Upper Pines Campground Areas	325	240	85
Lower Pines Campground Area	71	76	-5
North Pines and Backpackers Campgrounds and Curry Village Stables Areas	98	111	-13
Eagle Creek and Yellow Pine Administrative Campgrounds	46	4	42
<b>Yosemite Valley Totals<sup>a</sup></b>	<b>640</b>	<b>466</b>	<b>174</b>
Wawona	86	99	-13
<b>Wawona Total</b>	<b>86</b>	<b>99</b>	<b>-13</b>
<sup>a</sup> Totals include the construction of 16 new sites near Backpackers Campground and 40 new sites near Camp 4 area under actions common to Alternatives 2-6.			

As discussed in *Environmental Consequences of Actions Common to Alternatives 2–6*, and shown in **table 9-128**, the lightscape environment within Segment 2 would benefit from reductions in housing at Curry Village and the Yosemite Lodge areas. However, some of this benefit would be offset by the exterior glow of interior lighting, outdoor lighting, and continued vehicle traffic associated with the construction of new housing in the vicinity of Yosemite Village.

**TABLE 9-128: ALTERNATIVE 5 CONCESSIONER EMPLOYEE HOUSING AND VISITOR LODGING**

Location	Total Residential Units in Alternative 5	Change in Residential Units from Alternative 1	Total Visitor Lodging Units in Alternative 5	Change in Visitor Lodging Units from Alternative 1
Yosemite Village	390	-41	0	0
Ahwahnee hotel	42	-6	123	0
Curry Village	436	-146	453	53
Yosemite Lodge	104	14	245	0
Housekeeping Camp	n/a	n/a	232	-34
<b>Total Yosemite Valley<sup>a</sup></b>	<b>972</b>	<b>-179</b>	<b>1053</b>	<b>19</b>
Rancheria	191	84	n/a	n/a
El Portal Village	92	12	n/a	n/a
Abbieville	0	0	n/a	n/a
<b>Total El Portal<sup>b</sup></b>	<b>283</b>	<b>96</b>	<b>n/a</b>	<b>n/a</b>
<sup>a</sup> Totals include the 236 residential units that would be removed from the Curry Village and Yosemite Lodge areas of Segment 2 under actions common to Alternatives 2-6.				
<sup>b</sup> Totals include the 12 residential units that would be constructed in the El Portal Village area of Segment 4 under actions common to Alternatives 2-6.				



Removal of 34 lodging units from Housekeeping Camp would eliminate a notable source of artificial lighting within the valley, including the interior cabin lighting, vehicle headlights, and campfires associated with this facility. However, these benefits would likely be offset by the increase in housing at Curry Village. Expanded parking at Camp 6 could increase artificial lighting through overhead lighting and/or from the headlights of greater numbers of vehicles departing the area after sunset. With continued operation of Yosemite Lodge and parking in the vicinity of the Lodge, lighting impacts in this area would also increase, mainly due to the increase in vehicles and parking lot lighting. Over the long-term, the impact of these actions on Segment 2 lightscapes would be local, negligible, and adverse.

Under Alternative 5, the park would construct new housing for 84 employees within the Rancheria area of Segment 4. This project would contribute to area lightscape impacts through an increase in exterior lighting, the glow of interior lighting, and increased vehicle traffic. However, any new or modified exterior lighting would be required to comply with the park's lighting guidelines and nighttime construction restrictions, incorporated by reference herein as mitigation measures MM-LITE-1 and -2 (see Appendix C). With mitigation, the long-term impact on Segment 4 would be local, minor to moderate, and adverse. Within Segment 7, the park would remove 13 campsites from the Wawona Campground. The corresponding reduction in overnight visitation within these areas would reduce lightscape impacts. The impact on Segment 7 would be local, long-term, negligible, and beneficial.

**Segments 2, 4, and 7 Impact Summary:** Actions to manage user capacity, land use, and facilities would have local, long-term, adverse impacts on the lightscape environment, ranging from negligible to minor in Segments 2 and 4, and negligible beneficial in Segment 7.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Lightscape impacts associated with Alternative 5 management measures would result mainly from changes in park visitation, facilities serving overnight visitors, and employee housing, and generally be limited to Segments 2 and 4. The collective effect of Alternative 5 management actions would cause overnight visitation within the park to increase considerably. However, because of the type and location of the shift in overnight accommodations (i.e., campgrounds near existing developed areas of the park), and with mitigation, the impacts associated with that visitation are expected to be minimal. New campground and lodging facilities would be developed within Yosemite Valley, in relative proximity to existing developed areas. The lightscape environment within El Portal would be further affected by the construction of a considerable amount of new employee housing. Taken together, it is expected that existing and potential future sources of human-caused lighting throughout the Merced River corridor would increase relative to Alternative 1, resulting in an overall long-term, local, negligible to minor, adverse impact on the park's lightscape environment.

## **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

### ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

There are no anticipated development projects outside of those described here that would contribute to light pollution within the park. As a result, when combined with the impacts of past, present, and reasonably foreseeable actions, including those originating from outside the park, the cumulative effect of actions common to Alternatives 2-6 and those specific to Alternative 5 would be local, long-term, negligible, and adverse.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would not be expected to change appreciably under Alternative 6; wilderness access quotas would remain as under Alternative 1 and modifications to overnight accommodations would be nominal. As such, potential sources of artificial night lighting associated with overnight wilderness visitation would continue. Similarly, with designated camping unchanged, and with retention of several campground facilities, sources of artificial lighting (e.g., campfires) would remain concentrated within these areas of Segment 1. With continued operation of the Merced Lake High Sierra Camp at capacity, artificial lighting in the vicinity of the camp, including interior cabin lighting fixtures, would remain as under Alternative 1. The resulting impact on the environment within Segment 1 would be local, long-term, negligible to minor, and adverse.

**Segment 1 Impact Summary:** Actions to manage user capacity, land use, and facilities would have a local, long-term, negligible to minor, adverse impact on the lightscape environment of Segment 1.

#### **Segments 2, 4, and 7: Yosemite Valley, El Portal, and Wawona**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 6, specifically those concerning vehicle access and number of overnight accommodations, would contribute to a 33% increase in overnight visitation within Yosemite Valley. As discussed in the context of specific management actions below, this growth would affect an increase in valley-wide nighttime lighting through the corresponding shift in vehicles, lighted parking lots and lodging units, and other facilities to serve after-hours and overnight park visitors.

As shown in **table 9-129**, a considerable number of campsites would be added within Segment 2. These additions would increase sources of nighttime lighting, such as campfires and vehicle lighting in several

**TABLE 9-129: ALTERNATIVE 6 CAMPGROUND MODIFICATIONS**

	Campsites (Alternative 6)	Campsites (Alternative 1)	Change from Alternative 1
Yosemite Lodge and Camp 4 Areas	90	35	55
Former Upper & Lower River Campground Areas	72	0	72
Boys Town and Upper Pines Campground Areas	325	240	85
Lower Pines Campground Area	71	76	-5
North Pines and Backpackers Campgrounds and Curry Village Stables Areas	98	111	-13
Eagle Creek and Yellow Pine Administrative Campgrounds	83	4	79
<b>Yosemite Valley Totals<sup>a</sup></b>	<b>739</b>	<b>466</b>	<b>273</b>
Wawona	86	99	-13
<b>Wawona Total</b>	<b>86</b>	<b>99</b>	<b>-13</b>
<sup>a</sup> Totals include the construction of 16 new sites near Backpackers Campground and 40 new sites near Camp 4 area under actions common to Alternatives 2-6.			

areas, including Camp 4, the Former Upper and Lower River Campground areas, and the Upper Pines and Eagle Creek Campground area. This increase would offset lightscape benefits resulting from removal of campsites from Backpackers, Lower Pines, and North Pines campgrounds. The net effect of these changes to the lightscape environment within Segment 2 would be long-term, local, minor, and adverse.

As discussed in *Environmental Consequences of Actions Common to Alternatives 2–6*, and shown in table 9-130, the lightscape environment within Segment 2 would benefit from reductions in housing at Curry Village and the Yosemite Lodge areas. However, some of this benefit would be offset by the exterior glow of interior lighting, outdoor lighting, and continued vehicle traffic associated with the construction of new housing in the vicinity of Yosemite Village.

Removal of 34 lodging units from Housekeeping Camp would eliminate a notable amount of artificial lighting within the valley, including the interior cabin lighting, vehicle headlights, and campfires associated with this facility. Expanded parking and expansion of the Concessioner Maintenance and Warehouse Building at Yosemite Village/Camp 6 would increase artificial lighting through new exterior lighting and more vehicle traffic (i.e., headlights) departing the area after sunset. With continued operation of the Yosemite Lodge and new campgrounds and parking in its vicinity, lighting impacts in this area would also increase, mainly due to the increase in vehicles and camping-related nighttime activities. Over the long-term, the impact of these actions on Segment 2 lightscares would be local, negligible to minor, and adverse.

Under Alternative 6, the park would construct new employee housing within the Abbeville and Rancheria areas of Segment 4. These projects would contribute to area lightscape impacts through an increase in exterior lighting, the glow of interior lighting, and increased vehicle traffic. However, any new or modified exterior lighting would be required to comply with the park's lighting guidelines and nighttime construction restrictions, incorporated by reference herein as mitigation measures MM-LITE-1 and -2 (see Appendix C). With mitigation, the long-term impact on Segment 4 would be

**TABLE 9-130: ALTERNATIVE 6 CONCESSIONER EMPLOYEE HOUSING AND VISITOR LODGING**

Location	Total Residential Units in Alternative 6	Change in Residential Units from Alternative 1	Total Visitor Lodging Units in Alternative 6	Change in Visitor Lodging Units from Alternative 1
Yosemite Village	390	-41	0	0
Ahwahnee hotel	42	-6	123	0
Curry Village	436	-146	453	53
Yosemite Lodge	104	14	440	195
Housekeeping Camp	0	0	232	-34
<b>Total Yosemite Valley<sup>a</sup></b>	<b>972</b>	<b>-179</b>	<b>1248</b>	<b>214</b>
Rancheria	151	44	n/a	n/a
El Portal Village	92	12	n/a	n/a
Abbieville	263	258	n/a	n/a
<b>Total El Portal<sup>b</sup></b>	<b>506</b>	<b>314</b>	<b>n/a</b>	<b>n/a</b>
<sup>a</sup> Totals include the 236 residential units that would be removed from the Curry Village and Yosemite Lodge areas of Segment 2 under actions common to Alternatives 2-6. <sup>b</sup> Totals include the 12 residential units that would be constructed in the El Portal Village area of Segment 4 under actions common to Alternatives 2-6.				

local, moderate, and adverse. Within Segment 7, the Wawona stables would be removed and 13 campsites eliminated from the Wawona Campground. The corresponding reduction in overnight visitation within these areas would reduce lightscape impacts. The impact on Segment 7 would be local, long-term, negligible, and beneficial.

**Segments 2, 4, and 7 Impact Summary:** Actions to manage user capacity, land use, and facilities would have local, long-term, adverse impacts on the lightscape environment, ranging from minor to moderate in Segments 2 and 4, and negligible beneficial in Segment 7.

### Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

Lightscape impacts associated with Alternative 6 management measures would result mainly from changes in park visitation and facilities serving overnight visitors, and employee housing, and generally be limited to Segments 2 and 4. The collective effect of Alternative 6 management actions would cause overnight visitation within the park to increase. As discussed above, Alternative 6 management measures would add a considerable number of new lodging units, mainly campsites, within already developed areas of the park and some relatively remote areas of the park (i.e., the meadow east of El Capitan). Under Alternative 6, the lightscape environment within El Portal would be further affected by the construction of a substantial amount of new employee housing. Taken together, it is expected that existing and potential future sources of human-caused lighting throughout the Merced River corridor would increase relative to Alternative 1, resulting in a long-term, local, minor, adverse effect on the park's lightscape environment.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

#### ***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

There are no anticipated development projects outside of those described here that would contribute to light pollution within the park. As a result, when combined with the impacts of past, present, and reasonably foreseeable actions, including those originating from outside the park, the cumulative effect of actions common to Alternatives 2-6 and those specific to Alternative 6 would be local, long-term, minor, and adverse.

## Soundscapes

### *Affected Environment*

#### Regulatory Framework

##### *2006 National Park Service Management Policies*

**Soundscape Management** (Policy 4.9). The National Park Service (NPS) will preserve, to the greatest extent possible, the natural soundscapes of parks. The NPS will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (i.e., noise), and will protect natural soundscapes from unacceptable impacts. Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on park natural soundscapes. The NPS will take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified through monitoring as being acceptable to or appropriate for visitor uses at the sites being monitored.

**Cultural Soundscapes Management** (Policy 3.3.1.7). The NPS will preserve soundscape resources and values of the parks to the greatest extent possible to protect opportunities for appropriate transmission of cultural and historic sounds that are fundamental components of the purposes and values for which the parks were established. An example of appropriate cultural and historic sound includes native drumming at Yosemite National Park. The NPS will prevent inappropriate or excessive types and levels of noise from unacceptably affecting the ability of the soundscape to transmit the cultural and historic resource sounds associated with park purposes.

##### *Director's Order #47: Soundscape Preservation and Noise Management*

Director's Order #47 outlines the operational policies guiding the protection, maintenance, and restoration of the natural soundscape resource in the national park system. The directive instructs park managers to maintain natural soundscapes that are not affected by external (i.e., human-made) noise. By definition, noise is human-caused sound that is considered unpleasant and unwanted. Where the soundscape is found to be degraded, park managers are to facilitate and promote progress toward the restoration of the natural soundscape (NPS 2000b). There are 11 such instructions and requirements outlined in Director's Order #47.

##### *National Park Service Reference Manual 47*

National Park Service Reference Manual 47, *Soundscape Preservation and Noise Management*, prepared in response to Director's Order #47, provides the following: (1) technical guidance on soundscape management planning, including direction on the preparation of soundscape preservation and noise management plans (referred to as soundscape management plans); (2) direction on the measurement of sound characteristics to be applied in soundscape management planning; (3) technical guidance on education opportunities; (4) technical guidance on noise prevention and mitigation; and (5) direction on interagency planning.

### ***Yosemite General Management Plan***

The *Yosemite General Management Plan* outlines general management priorities for resource management in the park. With regard to sound, this management plan calls for the limitation of noise to the greatest extent possible. More specifically, it places high priority on reducing traffic congestion in Yosemite Valley to reduce the exposure of visitors to noise associated with motor vehicles. Among the tools available to the park for achieving this reduction in vehicle noise, specifically motorcycle noise, is regulatory enforcement.

### **Soundscape and Noise**

Soundscape is a term used by the NPS to describe the ambient noise setting for a given parkland area. In a park setting, a natural soundscape is an area characterized by various sound sources at detectable sound levels that typically occur without the intrusion of sounds caused by humans or human technology. Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Natural sounds occur within and beyond the range of sounds that humans can perceive, and they can be transmitted through air, water, or solid materials.

Noise is often defined as human-caused sound, and is considered to be unpleasant and unwanted. Whether a sound is considered unpleasant depends on the individual listening to the sound and what the individual is doing when the sound is heard (i.e., working, playing, resting, sleeping). While performing certain tasks, people expect and, as such, accept certain sounds. For instance, if a person works in an office, sounds from printers and copiers are generally acceptable and not considered unpleasant or unwanted. By comparison, when people are resting or relaxing, these same sounds are not desired. The desired sounds during these times are referred to as *natural quiet*, a term used to describe ambient (outdoor) natural sounds without intrusion of human-caused sounds. Natural quiet can be essential for some individuals to achieve a feeling of peace and solitude.

### **Existing Sources of Noise in the Merced River Corridor**

Natural sounds in Yosemite National Park and adjacent to the Merced River include waterfalls, flowing water, animals, rustling tree leaves, and many other sounds. These are not considered noise. Typical sources of noise in the park and project area include motor vehicles, human activity and aircraft. Noise does not have to be loud to have an impact on the natural environment.

### ***Motor Vehicles and Human Activity***

Corridorwide, motor vehicle noise is generated by visitor, NPS, and concessioner vehicles along roadways. Motor vehicle noise is associated with areas of concentrated visitor and administrative use, including all park roads and parking areas, Yosemite Village, all campgrounds, Yosemite Lodge, and NPS and concessioner stables. Noise from motor vehicles is loudest immediately adjacent to roads and parking areas, but due to generally low levels of natural sound in the background, vehicle noise may be audible a long distance from roads. Other noises associated with human activities in the Merced River



corridor include human voices, stock, park maintenance operations (e.g., construction and maintenance equipment, generators), and recreational activities (e.g., lodging, camping, housing).

Atmospheric conditions (e.g., wind, temperature, humidity, rain, snow) and topography can significantly affect the presence or absence of noise in the Merced River corridor. Additionally, dense vegetation may also produce significant sound attenuation over distance. In general, noise would be expected to be louder in areas where human activities are concentrated and where sound reverberates between natural features, such as canyon walls. The frequency, volume, and source of these noises vary dramatically by season, with the highest levels of noise expected during the summer when visitor use is at its peak.

Noise can affect an animal's physiology and behavior, and if it becomes a chronic stress, noise can be injurious to an animal's energy budget, reproductive success, and long-term survival (Radle 1998; Stone 2000; Brumm 2004). Road noise specifically has been implicated in the disturbance of several bird species, resulting in decreased densities of breeding pairs in the vicinity of roads (Krause 2001).

During one 2006 study, 24% of respondents reported hearing vehicle sounds. These noises were rated as slightly annoying and slightly unacceptable. Consequently, the authors of the study recommended that these sounds be considered second priority for management behind aircraft sounds (Newman et al. 2006).

### ***Aircraft***

As part of an aircraft overflight report to Congress in 1994, the NPS conducted a visitor use survey to determine the effects of aircraft noise on the visitor experience. Of the visitors surveyed, 55% reported hearing aircraft sometime during their visit. The report notes that recognition of noise from aircraft was highly variable from location to location and that impacts were greater when visitors removed themselves from automotive transportation and areas where other visitors were present. In Yosemite, a majority of the complaints came from wilderness trail users (BRW 1994).

Measurements made in 1993 at four locations in the park (Rafferty Creek, Soda Springs, Mirror Lake, and Glacier Point) indicated that aircraft were audible 30% to 60% of the time (NPS 1994b). Similar results were found in 2006 when 51% of visitors reported hearing aircraft noise. Because aircraft noise was also considered to be "annoying and unacceptable," the authors of this study recommended that addressing aircraft sounds should be considered a first priority for NPS management consideration (Newman et al. 2006).

### **Background Sound and Noise Levels**

Sound is mechanical energy transmitted by pressure waves through a medium such as air. As previously mentioned, noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), a logarithmic loudness scale with zero dB corresponding roughly to the

threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Because sound pressure can vary by over one trillion times within the range of human hearing, the logarithmic loudness scale is used to calculate and manage sound intensity numbers conveniently.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 hertz (Hz) and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. All sound/noise levels presented in this document are A-weighted.

Given the variation of community noise level from instant to instant, community noise levels must be measured over an extended period of time to characterize a community noise environment and evaluate cumulative noise impacts. This time varying characteristic of environmental noise is described using statistical noise descriptors. For example, the descriptor  $L_{eq}$  is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The data presented in this section represent the  $L_{eq}$  sound levels in the Merced River corridor.

Sound-level measurements were obtained for the original *Merced River Plan/EIS* at various locations adjacent to the Merced River (from the headwaters of the Merced River to the base of Vernal Fall), in Yosemite Valley, and in the Wawona area. Additional measurements were collected at Yosemite Village in 2006 for the *Yosemite National Park Acoustic Monitoring Report 2005 & 2006*. Measurements for the original *Merced River Plan/EIS* were obtained with a Larson Davis dosimeter (Model 700). The dosimeter was calibrated with a Larson Davis sound-level calibrator. Measurements for the *Yosemite National Park Acoustic Monitoring Report* were obtained using a Brüel & Kjær sound analyzer equipped with a GRAS Type 40AQ microphone. The measurement system was calibrated immediately before measurements were taken.

Observers in both cases noted the sources contributing to the background level and noted any sources that caused intrusive levels above the typical background sound level. Appendix F includes a table that describes the measurement locations, the measurement results, and the associated sources. Appendix F also includes a figure that shows where the measurements were taken. The results of these measurement efforts are described below, in the context of the Merced River segments from which they were obtained.

### ***Segment 1: Merced River Above Nevada Fall — Sound/Noise Levels***

Sound levels at the highest elevations of the Merced River corridor (between the Merced and Triple Peak Forks) measured 35 dB. Also in the headwaters area, approximately 2 to 2.5 miles southeast of Washburn Lake, sound levels ranged from 39 to 41 dB, with the influence of aircraft noise (the maximum observed levels with the aircraft were 43 and 56 dB). At and near Washburn Lake, sound levels ranged from 31 to 36 dB, with very little influence of sound from the river.

At a lower elevation, between Soda Springs and Washburn Lake, sound levels on the trail ranged from 35 to 42 dB. In the Bunnell Cascades and Soda Springs areas, sound levels ranged from 54 to 56 dB. These sound levels primarily resulted from Merced River water washing over granite cascades in both areas. Away from the river, in the Little Yosemite Valley Campground area, sound levels measured 40 dB (in an area with no human activity). At the viewing area overlooking Nevada Fall, sound levels measured 61 dB, with little falls and visitor-related noise accounting for the audible sound.

### ***Segment 2: Yosemite Valley — Sound/Noise Levels***

Measurements from the viewing area atop Vernal Falls and on the Mist Trail adjacent to the falls ranged from 66 to 76 dB. In Yosemite Valley, sound levels ranged from 44 to 47 dB along the Lower Yosemite Fall Trail, with maximum observed levels of 66 dB when people passed the monitor on the trail. Notably, there was no water in Yosemite Creek when the monitoring was performed. At Swinging Bridge, sound levels measured 50 dB, with noise from people constituting the greatest source of sound in the area. At Sentinel Bridge, sound levels measured 59 dB. This area experiences noise from vehicle traffic, but speeds are generally slow. Overall, the greatest source of sound was the numerous buses traversing the bridge. Near Happy Isles, sound levels measured 59 dB, with most of the sound resulting from people on the trails and using facilities nearby. In the camping area (Upper Pines Campground), sound levels varied from 32 dB when human activity levels were at the lowest (early in the morning) to 55 dB when activity levels increased during the day. Measurements taken near Yosemite Village reached 52 dB in early afternoon.

West of the Valley Visitor Center area, the river was calm in El Capitan Meadow and no people were present during the monitoring. Measured sound levels in this area were 39 dB. At Devils Elbow, water was flowing through the Merced River, but the sound of the river was minimal due to the lack of rocks and rapids. Sound levels in this area were 44 dB, with a maximum observed level of 67 dB when a bus passed on nearby Northside Drive. In the Cascades area, measured sound levels were 49 dB, with a recorded maximum level of 63 dB when a bus passed on Northside Drive.

### ***Segment 3: Merced River Gorge — Sound/Noise Levels***

On El Portal Road, at the stone bridge between Arch Rock and Big Oak Flat, sound levels measured 52 dB. Rushing water sounds accounted for the majority of the background levels. Measurements were taken in an area with no people. Some vehicle noise was audible from El Portal Road, but it was relatively minor due to distance and elevation (the river is approximately 40 feet below the grade of the roadway in this area).

### ***Segment 7: Wawona — Sound/Noise Levels***

In Wawona, sound levels were measured in the middle of the old Wawona Bridge on Wawona Road, and west of the covered bridge near the Pioneer Yosemite History Center. Sound levels in these areas were 50 dB and 44 dB, respectively, with maximum observed levels of 59 dB near the covered bridge. The river accounted for some background noise in this area, with vehicle traffic accounting for maximum noise levels.

### *Environmental Consequences Methodology*

Proposed management actions for each alternative were evaluated in terms of the context, intensity, and duration of the impacts on soundscape, and whether the impacts would be considered beneficial or adverse to the soundscape environment. The methodology for evaluating impacts on soundscapes was adapted from those provided by the NPS Natural Sounds Program Office (NPS 2007e). The soundscapes impact assessment involves the identification and qualitative description of the types of actions proposed under each alternative that could affect the ambient acoustic environment. For most sound sources, such characteristics would include the location and movement of the source, its operational features that produce sound, and how the sound would be distributed over time. Impacts are described as potential changes in the existing soundscape resulting from the proposed actions, as compared with existing conditions. The analysis of effects to soundscapes is qualitative, with professional judgment applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts. The effects of these actions are considered for sensitive human receivers only. Sensitive receivers include nearby residents and recreational users (both day-use and overnight users).

- **Context.** The context of the impact considers whether the impact would be local or regional. Impacts to soundscapes were determined to be local and limited to the Merced River corridor and immediate vicinity. For this reason, context will not be further discussed for soundscapes, except to the extent of describing which segments would be affected.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts are those in which the effects would not be detectable, having no discernible effect on the ambient environment. Minor impacts would be those that are slightly detectable but would not be expected to have an overall effect on the soundscape environment. Moderate impacts would be clearly detectable and could have an appreciable effect. Major impacts would have a substantial, highly noticeable influence on the ambient noise environment.
- **Duration.** The duration of the impact considers whether the impact would occur in the short-term or the long-term. A short-term impact would be temporary in duration or transitory in effect, such as construction noise. A long-term impact would have a permanent effect on the ambient noise environment.
- **Type of Impact.** Impacts are evaluated in terms of whether they would be beneficial or adverse to the ambient soundscape environment. Beneficial impacts would reduce noise levels, while adverse impacts would have the opposite effect.

### *Environmental Consequences of Alternative 1 (No Action)*

#### **All River Segments**

Alternative 1 (No Action) assumes the continuance of existing plans and policies, including the NPS *Management Policies 2006*, Director's Order #47, and the *Yosemite General Management Plan*, among other documents that guide management decisions and soundscapes in the Merced River corridor. Under Alternative 1, the soundscape among Segments 1–8 would remain dominated by natural sources

of sound (e.g., water, wind, birdsong and chatter). Noise levels would continue to be higher where visitor use is intense, such as campgrounds, roads, parking lots, and major trail routes and destinations.

Alternative 1 does not propose measures that would cause an increase in park visitation. However, park visitation is expected to increase at a rate of 3% per year over the next five years. As described in the “Transportation” section of this chapter, congestion around certain park entry points, busy intersections, and parking areas would continue during peak summer days, and associated noise impacts in these areas would persist. The park would continue to utilize discretionary authorities to limit park access during unusually busy days; however, no new formal systems or methods for controlling access would be implemented.

Overnight facilities, both lodging and camping, would remain at current levels, both in number and type of accommodation. This would limit potential increases in nighttime visitation and associated noise. Visitation could, however, shift to other “non-peak” periods of the year (e.g., fall and winter months, spring and fall weekends, summer weekdays). Such a shift would contribute to an increase in visitor-related noise during such periods. Maintenance and administrative activities (i.e., groundskeeping equipment, generators, HVAC, refrigeration, helicopter use in support of park operations) would also remain similar to those under present conditions. However, with increased visitation, such activities may be required more frequently, thereby causing an indirect increase in park noise. High-altitude aircraft overflights, an issue that is national in scope, would continue to affect soundscapes in the park. Aircraft noise is highly variable from location to location and impacts are greater when visitors are in areas removed from other vehicle traffic and visitor noise. Impact determinations are discussed for specific segments and summarized below.

### **Segment 1: Merced River above Nevada Fall**

Noise levels in the area of Segment 1 would remain similar to current conditions. Under Alternative 1 (No Action), soundscapes in wilderness segments would continue to remain dominated by natural sources of sound, punctuated by noises from aircraft and the occasional human voice or sound made by pack stock. Use of visitor facilities would continue to increase with visitation. Some impacts on natural soundscapes would be expected in areas of easily accessible wilderness (e.g., the trail to Half Dome) and campgrounds (e.g., Little Yosemite Valley, Merced Lake Backpackers Camp, Merced Lake High Sierra Camp, Nevada Fall Overlook). It is anticipated that annual daytime use of these areas would increase with the projected increase in visitor demand, thereby raising the level of human-related sounds (e.g., talking and hiking). A rise in human-related sounds would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment by diminishing the natural quiet and sounds of nature that help make up the wilderness character that is valued in the park.

**Segment 1 Impact Summary:** A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment.

## Segment 2: Yosemite Valley

Noise levels in the area of Segment 2 would remain similar to current conditions. Segment 2 provides the greatest diversity of recreation activities in the Merced River corridor. Day use sites, such as Swinging Bridge, Sentinel Beach, and Cathedral Beach, would continue to exceed capacity, resulting in crowding. These areas would continue to be affected by noise, and noise levels would proportionally rise with the increase of visitors. Noise levels would also continue to be affected by vehicular use. Roads are often crowded during peak months (i.e., near Camp 6, Arch Rock, Wawona proper, Yosemite Lodge). With increased visitation, the frequency and duration of transitory sound sources (i.e., passing vehicles) would also increase. Under Alternative 1, crowding and congestion would contribute to an increase of unnatural sounds that could diminish the natural quiet and sounds of nature that are valued by visitors to the park. The continuation of present visitation trends would, therefore, contribute to a long-term, minor, adverse impact on the soundscape in Segment 2.

**Segment 2 Impact Summary:** A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment.

## Segments 3 and 4: Merced River Gorge and El Portal

Noise levels in the area of the Merced River gorge and El Portal would remain similar to current conditions. Under Alternative 1, higher noise levels caused by vehicular use near roadways would persist. As with Segment 2, the frequency and duration of transitory sound sources would increase with park visitation. The continued trends in visitor-related noise would result in a long-term, negligible to minor, adverse impact on the soundscape in Segment 3, and a long-term, minor, adverse impact in Segment 4.

**Segments 3 & 4 Impact Summary:** A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment in Segment 3, and a long-term, minor, adverse impact on the soundscape within Segment 4.

## Segments 5, 6, 7, and 8: South Fork Merced River, Wawona Impoundment, and Wawona

Noise levels in the area of Segments 5, 6, and 8 would remain similar to current conditions. Under Alternative 1, soundscapes in wilderness segments would continue to be dominated by natural sources of sound, punctuated by noise from aircraft and the occasional human voices. Visitor noise levels are not as common because of topography and limited trail access. The increase in visitor-related noise exposure in these areas is speculative due to continued limited accessibility to these portions of the South Fork Merced River. Therefore, it is not known whether visitation to these areas would increase relative to existing conditions.

Noise levels in the area of Segment 7 would remain similar to current conditions. Segment 7 is often crowded with visitors participating in daytime recreation activities, and under Alternative 1 noise levels caused by visitor crowding and congestion would continue, especially during the peak season at popular day use areas. Furthermore, visitation would be expected to increase in these areas, which

would raise noise levels proportionally. The anticipated visitor-related noise would contribute to a long-term, minor, adverse impact on the soundscape in Segment 7.

**Segments 5-8 Impact Summary:** A gradual increase in park visitation, and associated human-caused noise, would contribute to a long-term, minor, adverse impact on the Segment 7 soundscape environment. The increase in visitor-related noise exposure in Segments 5, 6, and 8 is speculative due to continued limited accessibility to these areas. Therefore, it is not known whether visitation, or associated noise levels within these areas would increase relative to existing conditions.

### Summary of Alternative 1 (No Action) Impacts

Alternative 1 would accommodate a gradual increase in annual visitation over the next five years. Shifting visitation trends could result in additional people visiting the park during months outside of the typical peak season (i.e., April, May, September, October) and increasing noise levels during this time. Overall increased visitation would lead to a long-term, negligible to minor, adverse impact on the soundscape environment.

### Cumulative Impacts of Alternative 1

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of Alternative 1. The projects identified below include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

#### *Past Actions*

Development of facilities over time has created short-term sources of noise from construction and facility removal activities. Examples of past short-term noise sources include: removal of Cascades Housing and Happy Isles Gauging Station Bridge; restoration activities at Cook's Meadow and Happy Isles; construction of housing at Curry Village and rehabilitation of Curry Village structures; and improvements to El Portal Road, Wawona Road, and Yosemite Valley Shuttle bus stops. Overall facility development and increased visitation has resulted in long-term sources of noise.

The *Superintendent's Compendium* and the 1989 *Wilderness Management Plan* indirectly limit the overall noise levels in the river corridor. The *Superintendent's Compendium* traffic thresholds were developed for use when traffic and parking conditions in Yosemite Valley are overly congested. The policy has the indirect effect of limiting the amount of vehicle noise during peak periods by restricting the number of automobiles entering certain areas of the park until the traffic volume and parking demand sufficiently decreases. The *Wilderness Management Plan* was developed to preserve a wilderness environment in which the natural world, along with the processes and events that shape it, remain largely untouched by human interference. Implementation of the permit system for overnight camping under the *Wilderness Management Plan* reduces potential noise impacts in those areas where natural quiet is an important element of the visitor experience. A switch to hybrid busses used for the Yosemite shuttle service resulted in a decrease in noise from the old shuttle system.



***Present Actions***

Utility and road improvements, including the Parkwide Communication Data Network upgrade, would have temporary noise impacts during construction that could affect the Merced River corridor. Temporary noise impacts also occur during some general, ongoing restoration activities.

***Reasonably Foreseeable Future Actions***

Under Alternative 1, park visitation is expected to increase at a rate of 3% per year over the next five years. Short-term adverse noise effects from construction, rehabilitation and removal projects are reasonably foreseeable. Examples include Ahwahnee Hotel rehabilitation, general restoration activities, rehabilitation to roadways and parking lots, Curry Village rehabilitation and removal of structures in the Curry Village rock fall hazard zone.

***Overall Cumulative Impact***

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. Increasing numbers of visitors, during both peak and non-peak seasons, could result in long-term, negligible to minor impacts.

***Environmental Consequences to Actions Common to Alternatives 2–6*****All River Segments*****Impacts of Actions to Protect and Enhance River Values***

Restorative action in all river segments and under all alternatives could involve the use of heavy equipment which produce short-term, moderate, adverse impacts on the natural soundscape. For purposes of this analysis, heavy equipment in the soundscape discussion includes skid steers, excavators, loaders, and/or dump trucks. With implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), impacts of construction on soundscapes would be reduced.

**Biological Resource Actions.** Program level actions include the removal of informal trails and the removal of campsites from within 100 feet of the ordinary high-water mark. The use of heavy equipment during removal activities would be determined on a project specific basis, but would be expected to have a short-term, negligible to minor adverse soundscape impact. After campsites and informal trails are removed, potential noise sources would be reduced, resulting in a long-term, negligible to minor, beneficial impact on the Merced River corridor's natural soundscape.

**Hydrologic/Geologic Resource Actions.** Program level actions include the removal of rip rap, abandoned infrastructure where it alters hydrology, management of large wood and the addition of constructed log jams. These actions would involve the use of heavy equipment and/or haul trucks which would have short-term, moderate, adverse impacts on the soundscape in the vicinity of the action.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

As discussed further in “Socioeconomics”, actions to maintain or reduce visitor capacity would likely result in a displacement or “time-shift effect”. Unable to secure reservations for their first-choice time period to visit the park, some people will likely change their plans to visit the park during off-peak periods, such as the fall or winter months. Not all types of accommodations are conducive to this type of time shift. While hard-sided cabin units may be able to accommodate travelers year round, camping and tent accommodations may not work as well in colder seasons. Thus it is anticipated that human-related noise would increase during off-peak periods, primarily in high-use areas. The impact of this time-shift effect would occur under Alternatives 2–6. This would contribute to a long-term, minor, adverse impact on the soundscape environment.

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Programmatic removal and relocation of trails in Segment 1 could involve the use of heavy equipment although this would be determined and further analyzed during a subsequent planning process.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values within Segment 2 that would occur across Alternatives 2–6 include removal of abandoned infrastructure and other development affecting the Merced River’s hydrologic function, extensive meadow restoration, and management of high visitor-use areas to address associated impacts on riparian habitats and sensitive cultural resources. These actions would require a temporary noise increase within the vicinity of project sites, resulting from construction activities and vehicle noise. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project area. Most of these activities would occur in areas distant from noise-sensitive uses. As a result, soundscape/noise impacts resulting from implementation of these actions would be short-term, negligible to minor, adverse impact on soundscapes in the vicinity of these actions.

**Biological Resource Actions.** Heavy equipment would be used for actions throughout Segment 2 including: formalizing El Portal Road pullouts, ditching in meadows; elevation of a bike path and removal of informal trails in Leidig Meadow; protection of wetlands at Stoneman Meadow; removal of fill, road bed and roadside parking in Cook’s Meadow; removal of the abandoned Rocky Point Sewage Plant; removal of abandoned infrastructure in Royal Arches Meadow; removal of abandoned infrastructure and restoration of the former Lower Pines campground; Eagle Creek drainage channelization; riparian improvements at Swinging Bridge; restoration at Cathedral Beach picnic area; and restoration of the Ahwahnee Meadow former golf course and tennis court area. Operation of this equipment would have a short-term, moderate, adverse impact in the vicinity of the action.

**Hydrologic/Geologic Resource Actions.** Removal of pack stock trail from concessioner stables to Happy Isles, removal of former Happy Isles footbridge footings, relocation of Upper Pines dump

station, abandoning the gauging station at Pohono Bridge, restoration of floodplain areas at Camp 6, restoration of former Yosemite lodge units and cabin, and riverbank improvements between Clark's and Sentinel Bridges would involve the use of heavy equipment. Operation of this equipment would have a short-term, moderate, adverse impact in the vicinity of the action.

**Scenic Resource Actions.** Scenic Vista Management (see Appendix H) in Segment 2 under Alternatives 2-6 would largely involve the thinning and removal of trees and shrubs. Areas where more than 200 trees would be removed include Ferry Bend Turnout, The Ahwahnee area, El Capitan Meadow, and Church Bowl Picnic Area. Valley View contains a large number of dead trees from a controlled burn in 2007; over 500 trees could be removed on approximately four acres from Valley View. The impact of scenic resource actions on soundscapes would be short term, moderate and adverse in the vicinity of the actions.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Actions to manage visitor use and facilities in the vicinity of Yosemite Valley, including the removal of several visitor-serving and administrative facilities, removal of employee housing, removal of numerous campsites, and various transportation and parking management measures, would require heavy equipment and construction activity that would yield moderate levels of noise. Construction traffic including heavy construction equipment and haul trucks would temporarily add to the noise environment on local roadways. Noise from demolition/construction work would have a short-term, moderate, adverse impact on the natural soundscape. The overall reduction in visitor and residential facilities would be expected to reduce overall noise levels, contributing to a long-term, minor, beneficial impact on Yosemite Valley soundscape environment.

**Curry Village and Campgrounds.** The park would remove the Happy Isles Snack Stand at Curry Village. At The Ahwahnee, the park would remove the swimming pool and tennis courts; redesign, formalize, and improve drainage within the existing parking lot; and construct a new 50 parking space lot east of the current parking area. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the parking lot expansion would have the opposite effect. The long-term impact on the soundscape environment would be local, negligible, and adverse.

**Camp 6 and Yosemite Village.** The park would remove from Yosemite Village the Concessioner General Office, Concessioner Garage, and the Arts and Activities Center (Bank Building), and repurpose the Village Sports Shop for public use. It would also construct a new maintenance building near the Government Utility Building. The park would remove roadside parking along Sentinel Drive and expand Camp 6 parking into the footprint of the Concessioner Garage. To improve visitor access between the Camp 6 area and Village, the park would construct a pathway connecting the new Camp 6 parking lot with the repurposed Village Sports Shop. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely

within the footprint of existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

**Camp 4 and Yosemite Lodge.** The park would remove the NPS Volunteer Office, post office, swimming pool, and snack stand. It would also remove old and temporary employee housing (Thousands Cabins and Highland Court) and replace it with new housing. In addition, the park would relocate the Yosemite Lodge maintenance and housekeeping facilities and repurpose the food court. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, and new housing construction would largely occur within already developed areas. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have short-term, moderate, and adverse impacts on the soundscape environment. These actions would not be expected to have a long-term impact on the soundscape environment. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on the soundscape environment in the vicinity of specific projects.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

To protect and enhance river values within the Merced River gorge and El Portal, the park would remove informal trails, nonessential roads, fill materials, and abandoned infrastructure throughout Segments 3 and 4. The planning and design; demolition, removal, transport, and disposal of waste materials; and restoration of these areas would involve the use of heavy equipment. The associated impact on the soundscape environment within Segments 3 and 4 would be short-term, local, minor to moderate, and adverse.

**Biological Resource Actions.** Removal of asphalt and fill at Trailer Park and Abbieville would involve the use of heavy equipment. Operation of this equipment within Segment 4 would have a short-term, moderate, adverse impact in the vicinity of the action.

**Hydrologic/Geologic Resource Actions.** Removal of abandoned infrastructure at Cascades Picnic area, restoration of Greenemeyer sand pit, and paving of parking areas at El Portal Maintenance and Administrative Complex would involve the use of heavy equipment. Operation of this equipment within Segment 4 would have a short-term, moderate, adverse impact in the vicinity of the action.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions concerning visitor facilities and employee housing that would occur in Segment 4 across Alternatives 2–6 would involve temporary increases in noise from construction and traffic. Noise from construction work is expected to have a short-term, moderate, adverse impact on the natural

soundscape. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria Flat and El Portal. The expected impact on soundscapes would be long-term, minor, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segments 3 & 4 would have short-term, minor to moderate, adverse impacts on soundscapes in the project vicinity. Actions to manage user capacities, land use, and facilities would have short- and long-term, minor, and adverse impacts on the soundscape environment within Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River, Wawona Impoundment, and Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions proposed for Alternatives 2–6 to address campground waste management and protect cultural resources would increase construction and vehicle-related noise in the Segment 7. As a result, noise-sensitive uses near construction operations would be expected to experience a short-term, minor, adverse impact relative soundscapes. Daily operations of the proposed pump station above Wawona Campground would be expected to have a long-term, negligible to minor, adverse impact on nearby residential receivers, including campground users. Noise exposure from daily operations of this facility should be considered upon design.

**Hydrologic/Geologic Resource Actions.** Development of the Wawona Campground wastewater collection system, abandonment of infrastructure in the South Fork Merced River side channels, and relocation of the Wawona dump station would involve the use of heavy equipment. Operation of this equipment would have a short-term, moderate, adverse impact in the vicinity of the action. Daily operations of the proposed pump station above Wawona Campground would be expected to have a long-term, negligible to minor, adverse impact on nearby residential receivers and recreational park users within Segment 7. Noise exposure from daily operations of this facility should be considered upon design.

**Cultural Resource Actions.** The removal of campsites from culturally sensitive areas would reduce long-term noise exposure in Segment 7. This action would have a long-term, negligible, beneficial impact on the soundscape environment in the area of the action.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Proposed actions concerning visitor and administrative facilities and parking, including enhancing river access, restroom, picnic, and bus stops within Wawona; removing staged materials, abandoned utilities, vehicles, and a parking lot from the riparian buffer at the Wawona Maintenance Yard; and removing roadside parking between the Wawona Store and Chilnualna Falls Road would introduce temporary project-related increases in construction and traffic noise in Segment 7. Noise from construction activities within Segment 7 would have a short-term, moderate, adverse impact on the natural soundscape. Operational noise associated with the proposed administrative facilities in Wawona may have long-term, minor to moderate, adverse impacts on existing noise-sensitive uses in

the vicinity. Site-specific acoustical studies would be appropriate to address noise mitigation from these facilities at existing noise-sensitive uses within 1,000 feet.

**Wawona.** The park would redesign the bus stop at the Wawona Store to accommodate increased visitor use. This project would mostly be completed by the use of hand and power tools. The resulting impact on the soundscape environment in the project vicinity would be short-term, negligible, and adverse.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segment 7 would result in local, short-term, negligible to minor, adverse impacts; but would not be expected to have long-term impacts. Operational noise at new administrative facilities would contribute to local, long-term, minor to moderate, adverse impacts on the soundscape environment.

### **Summary of Impacts Common to Alternatives 2–6**

Temporary noise from heavy equipment and construction would be a short term, local, moderate, adverse impact from proposed actions. The acoustical environment in wilderness areas would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by human-caused sources of noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. With implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), the long-term impact on the park's natural soundscape would be local, minor to moderate, and beneficial, resulting mainly from removal of visitor serving facilities and employee housing in Segment 2.

## ***Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Changes to the trailhead quota system and camping area modifications would reduce long-term noise exposure in these areas, having an overall long-term, negligible to minor, beneficial impact on soundscapes.

**Merced Lake High Sierra Camp.** The park would close the Merced Lake High Sierra Camp and remove all associated infrastructure, convert the area to designated Wilderness, and expand dispersed camping at Merced Lake Backpackers Camping Area into the former High Sierra Camp footprint. These actions would require construction efforts which would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, moderate, adverse impacts on soundscapes in the vicinity.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible to minor, beneficial impact on soundscapes due to reduced visitation.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area, and rerouting and revegetating a portion of the Valley Loop Trail. This work would require the use of heavy equipment and likely take several weeks to a few months to complete. The resulting impacts on the natural soundscape environment within these areas would be short-term, minor to moderate, and adverse.

**Biological Resource Actions.** In Segment 2, restorative actions including removal of portions of Northside Drive, restoration at Stoneman and El Capitan Meadows, redesign of Curry Orchard Parking lot, removal of abandoned infrastructure and Upper and Lower Rivers Campground, removal of campsites in Yosemite Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

**Hydrologic/Geologic Resource Actions.** The removal of Awhawnee and Sugar Pine bridges and associated berms under Alternative 2 would involve the use of heavy equipment and explosives to drop the bridges and dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 2, including removal of lodging and campsites, parking improvements at Curry Village and Camp 6, and new camping and parking facilities at Yosemite Lodge, would involve the use of heavy equipment. Construction noise and associated traffic would have a short-term, moderate, adverse impact. The reduction in lodging, campsites, and overall visitation would combine to reduce noise within these areas of Yosemite Valley, resulting in a long-term, minor to moderate, beneficial impact on the soundscape environment.

New camping and parking facilities would result in long-term, minor, adverse impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas. Some of these actions may also have long-term beneficial implications for the Yosemite Valley's soundscape environment. For example, removal of campsites from the floodplain and closure of Housekeeping Camp would reduce long-term noise exposure in the affected areas, having an overall long-term, negligible to minor, beneficial impact on the soundscape environment.

**Curry Village and Campground.** The park would construct 78 new hard-sided units in Boys Town, bringing the total number of new and retained units at Curry Village to 433. The park would remove campsites from Lower Pines (32), North Pines (86), and Upper Pines (24). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would



require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the construction of new units would have the opposite effect. The long-term impact on the soundscape environment would be local, minor, and beneficial.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing Camp 4 and Yosemite Lodge. The park would convert the Highland Court area to a walk-in campground; reconfigure pedestrian crossing of Northside Drive and Yosemite Lodge Drive, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate, and adverse impacts on the soundscape environment. Actions to manage user capacities, land use, and facilities would also have short-term, local, minor to moderate, adverse, impacts on Segment 2 soundscapes. However, the long-term impacts would be local, minor to moderate, and beneficial.

## **Segments 3 and 4: Merced River Gorge and El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Management actions to address facilities under Alternative 2, specifically campsite and new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be

expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria Flatt and Abbieville. The expected impact on soundscapes would be long-term, minor, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity. These actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, minor, adverse impacts on the soundscape environment within Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Restoration activities in Segment 7, including the removal of Wawona Golf Course, would increase construction-related noise in the general work vicinity, and project vehicles would add to the existing traffic noise production from nearby roadways. Noise from demolition/construction work would produce a short-term, minor, adverse impact at noise-sensitive uses in the vicinity. In the long-term the removal of the golf course would result in minor, beneficial impacts as maintenance- and visitor-related sources of noise in this area would be eliminated.

**Biological Resource Actions.** Restoration activities, including relocation of two stock use campgrounds, would involve heavy equipment which would have a short-term, minor, adverse impact in the vicinity of the action within Segment 7.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Elimination of concessioner stable operations and day rides and restroom improvements at Wawona would result in short-term, minor to moderate, adverse impacts on soundscapes in the vicinity from construction noise. Reduced activity in the vicinity would contribute to a long-term, negligible, beneficial impact.

**Wawona Campground:** Under Alternative 2, the park would reduce the size of the Wawona Campground. Thirty-two campsites, or 33% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape environment within Segment 7 environment.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce a long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

## **Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, minor to moderate, benefits to soundscapes in the Merced River corridor.

## **Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects are the same as those identified for Alternative 1, above, and include only those projects that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

### ***Overall Cumulative Impact***

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in nonwilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities. However, these long-term increases would be offset by long-term, moderate, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.

## ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Changes to the trailhead quota system and removal of the Merced Lake High Sierra Camp would reduce noise exposure in Segment 1, having an overall long-term, negligible to minor, beneficial impact on soundscapes.

Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and use the former camp area for a temporary stock camp. These actions would require construction efforts that would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to produce short-term, moderate, adverse impacts on soundscapes in the vicinity. Where they are not near sensitive receivers, the noise impacts of these actions would be negligible.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible to minor, beneficial impact on soundscapes due to reduced visitation.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area, and rerouting and revegetating a portion of the Valley Loop Trail. This work would require the use of heavy equipment and likely take several weeks to a few months to complete. The resulting impacts on the natural soundscape environment within these areas would be short-term, minor to moderate, and adverse.

**Biological Resource Actions.** In Segment 2, restorative actions including removal of portions of Northside Drive, restoration at Stoneman and El Capitan Meadows, redesign and reduction in size of Curry Orchard Parking lot, removal of abandoned infrastructure and Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

**Hydrologic/Geologic Resource Actions.** The removal of Awhawnee and Sugar Pine bridges and associated berms under Alternative 3 would involve the use of heavy equipment and explosives to drop the bridge and dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 3, including work at Curry Village and west of Yosemite Lodge, new housing development at Yosemite Lodge, new camping facilities east of Camp 4 and at Upper Pines Campground, along with several small transit and pedestrian access improvements, would require construction efforts and the use of heavy equipment. Construction noise would have a short-term, moderate, adverse impact.

New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas. Some of these actions may also have long-term beneficial implications for the Yosemite Valley's

soundscape environment. For example, removal of campsites from the floodplain and closure of Housekeeping Camp would reduce long-term noise exposure in the affected areas, having an overall long-term, negligible to minor, beneficial impact on the soundscape environment.

**Curry Village and Campground.** The park would retain 355 guest units at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas. The long-term impact on the soundscape environment would be local, minor, and beneficial.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing to west of the Northside Drive and Yosemite Lodge Drive, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate and adverse impacts on the soundscape environment, but would not be expected to have long-term impacts. Actions to manage user capacities, land use, and facilities would local, long-term, minor to moderate, beneficial impacts on the soundscape environment.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Management actions to address facilities under Alternative 3, specifically new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Increases in exposure to local roadway traffic noise. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in El Portal. The expected impact on soundscapes would be long-term, minor, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have long-term impacts. Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor, adverse impacts on the soundscape environment within Segment 4.

**Segment 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona*****Impacts of Actions to Protect and Enhance River Values***

Restoration activities in Segment 7, including those at the Wawona Golf Course, would increase construction-related noise in the general work vicinity, and project vehicles would add to the existing traffic noise production from nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would produce a short-term, minor, adverse impact at noise-sensitive uses in the vicinity. In the long-term the removal of the golf course would result in minor, beneficial impacts as maintenance- and visitor-related sources of noise in this area would be eliminated.

**Biological Resource Actions.** Restoration activities, including relocation of two stock use campgrounds from Segment 7, would involve heavy equipment which would have a short-term, minor, adverse impact in the vicinity of the action.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Elimination of the concessioner stable operations and day rides and restroom improvements at Wawona would result in short-term, minor to moderate, adverse impacts on soundscapes in the vicinity from construction noise. Reduced activity in the vicinity would contribute to a long-term, negligible, beneficial impact.

**Wawona Campground.** Under Alternative 3, the park would reduce the size of the Wawona Campground. Twenty seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape environment within Segment 7.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce n long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, minor to moderate benefits to soundscapes in the Merced River corridor.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

### ***Overall Cumulative Impact***

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.



## ***Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration***

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

The park proposes no actions to protect and enhance river values in Segment 1 that would occur only under Alternative 4.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Changes to the trailhead quota system and removal of the Merced Lake High Sierra Camp would reduce noise exposure in Segment 1, having an overall long-term, negligible to minor, beneficial impact on the soundscape environment.

Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and restoration of the former camp area to natural conditions. These actions would require construction efforts that would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, moderate, adverse impacts on soundscapes in the vicinity.

**Segment 1 Impact Summary:** Actions to Manage User Capacities, Land Use, and Facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible to minor, beneficial impact on soundscapes due to reduced visitation.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 2, restorative actions to protect and enhance river values, such as parking area relocation, and trail and shoreline access management measures, would increase temporary demolition/construction noise and project-related vehicle noise in the project areas. Heavy construction equipment and would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would have a short-term, minor, adverse impact on noise-sensitive uses in the vicinity.

**Biological Resource Actions.** In Segment 2, restoration at Housekeeping Camp and Stoneman Meadow, redesign and reduction in size of Curry Orchard Parking lot, removal of abandoned infrastructure at Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

**Hydrologic/Geologic Resource Actions.** The removal of Awhawnee and Sugar Pine bridges and associated berms under Alternative 4 would involve the use of heavy equipment and explosives to drop the bridge and dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 4, including the removal of lodging units, construction of new campgrounds, and parking improvements at Curry Village, Camp 6, and Yosemite Lodge, would require construction efforts that would involve heavy equipment. Construction noise would have a short-term, moderate, adverse impact.

New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas.

**Curry Village and Campground.** The park would retain 355 guest units and construct a new 40 site campground at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas. The long-term impact on the soundscape environment would be local, minor, and beneficial.

**Camp 6 and Yosemite Village.** The park would improve the configuration of and on-grade pedestrian crossing at the Northside Drive-Yosemite Village Drive intersection, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 750 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. However, the increase in parking availability would likely increase visitor-related noise in the vicinity of the parking lot. As such, the long-term impact on the soundscape environment would be local, negligible to minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have short-term, minor, adverse impacts on the soundscape environment, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would local, long-term, minor, beneficial impacts on the soundscape environment.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Management actions to address facilities under Alternative 4, specifically new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria. The expected impact on soundscapes within Segment 4 would be long-term, minor, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, minor, adverse impacts on the soundscape environment within Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona**

#### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** Restoration activities, including relocation of two stock use campgrounds within Segment 7, would involve heavy equipment which would have a short-term, moderate, adverse impact in the vicinity of the action.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Elimination of the concessioner stable operations and day rides, campsite removal and relocation, and restroom improvements at Wawona would result in short-term, moderate, adverse impacts on soundscapes in the vicinity from construction noise. The removal of campsites from culturally

sensitive areas would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape environment within Segment 7.

**Wawona Campground.** Under Alternative 4, the park would reduce the size of the Wawona Campground. Twenty-seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial soundscape impact. Actions to manage user capacity, land use, and facilities would reduce long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, minor benefits to soundscapes in the Merced River corridor.

### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

### ***Overall Cumulative Impact***

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the

vicinity of these facilities. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration***

#### **Segment 1: Merced River above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Alternative 5 actions related to visitor use and facilities in Segment 1, including removal of certain facilities and infrastructure, would require construction efforts that would yield construction noise. In addition, such work would likely require several helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, moderate, adverse impacts on soundscapes in the vicinity.

**Merced Lake High Sierra Camp.** The park would reduce the capacity of the Merced Lake High Sierra Camp to 42 beds and replace the flush toilets with composting toilets. The effort and equipment required remove these facilities would be similar to that described above, resulting in a short-term, moderate, adverse impact on soundscapes in the vicinity of the Camp. Reductions in the number of Merced Lake High Sierra Camp overnight visitors would reduce noise exposure in Segment 1, having an overall long-term, negligible, beneficial impact on soundscapes.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, moderate, adverse impacts due to construction noise; but have an overall long-term, negligible, beneficial impact on soundscapes due to reduced visitation.

#### **Segment 2: Yosemite Valley**

##### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. This work would require the use of heavy equipment and haul trucks. As such, the work associated with these actions would result in a short-term, minor to moderate, adverse impact on Segment 2 soundscapes.

**Biological Resource Actions.** In Segment 2, restoration at Housekeeping Camp and Stoneman Meadow, removal of abandoned infrastructure at Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts.

**Hydrologic/Geologic Resource Actions.** The removal of Sugar Pine Bridges and its associated berm under Alternative 5 would involve the use of heavy equipment and explosives to drop the bridge and

dismantle the abutments. Operation of this equipment would have a short-term, moderate to major, adverse impact in the vicinity of the action.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 5, including the removal of lodging units, construction of new campgrounds, and parking improvements at Curry Village, Camp 6, and Yosemite Lodge, would require construction efforts that involve the use of heavy equipment. Construction noise and associated traffic would have a short-term, moderate, adverse impact. New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the construction of new units would have the opposite effect. The long-term impact on the soundscape environment would be local, negligible, and adverse.

**Camp 6 and Yosemite Village.** The park would construct a pedestrian underpass and a traffic circle at the intersection of Northside and Yosemite Village Drives, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. However, the increase in parking availability would likely increase visitor-related noise in the vicinity of the parking lot. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate, adverse impacts on the soundscape environment, but would not

be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on the soundscape environment.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Management actions to address facilities under Alternative 5, namely new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria. The expected impact on Segment 4 soundscapes would be long-term, minor, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, minor, adverse impacts on the soundscape environment within Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River Wawona Impoundment, and Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Restoration activities, including relocation of two stock use campgrounds, would involve heavy equipment which would have a short-term, moderate, adverse impact on the Segment 7 soundscape environment.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Campsite removal and relocation, and restroom improvements at Wawona, would require construction efforts that would result in short-term, moderate, adverse impacts on soundscapes in the vicinity from construction noise.

**Wawona Campground.** Under Alternative 5, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate,



adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The acoustical environment in Yosemite Wilderness would benefit from the removal of the Merced Lake High Sierra Camp and modifications to the trailhead quota system. Wilderness would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, would produce long-term, minor, noise impacts in the vicinity of such facilities, while removal activities would have the opposite effect. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be reduced relative to Alternative 1, resulting in local, long-term, negligible to minor benefits to soundscapes in the Merced River corridor.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

#### ***Overall Cumulative Impact***

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. The construction of new facilities, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.

## ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

### **Segment 1: Merced River above Nevada Fall**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Alternative 6 actions related to visitor use and facilities in Segment 1, including removal and replacement of certain facilities and infrastructure, would require construction efforts that would yield construction noise. In addition, such work may require one or more helicopter trips to transport camp infrastructure. This noise would be short-term due to the temporary nature of the operations. Where these operations are near sensitive receivers, such as occupied campsites, they would be expected to have short-term, minor to moderate, adverse impacts on soundscapes in the vicinity.

**Merced Lake High Sierra Camp.** The park would retain the Merced Lake High Sierra Camp and replace the flush toilets with composting toilets. The effort and equipment required to undertake these actions would be similar to that described above, resulting in a short-term, minor to moderate, adverse impact on soundscapes in the vicinity of the Camp.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have short-term, minor to moderate, adverse impacts due to construction noise, but would not be expected to have any appreciable long-term impacts.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removing buildings from the Yosemite Lodge area, and rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. This work would require the use of heavy equipment and likely take several weeks to a few months to complete. The resulting impacts on the natural soundscape environment within these areas would be short-term, minor to moderate, and adverse.

**Biological Resource Actions.** In Segment 2, restoration at Housekeeping Camp and Stoneman Meadow, removal of abandoned infrastructure at Upper and Lower Rivers Campground, removal of campsites in Valley campgrounds, and rerouting of trail in various meadows, would include the use of heavy equipment which would have short-term, moderate, adverse impacts. Under this alternative, Sugar Pine Bridge would be retained, constructed log jams and large wood installed at its base, and its condition monitored. Should long-term monitoring reveal mitigation measures are not sufficient, the park may undertake more aggressive management action, including removal of the bridge. Such action would require the use of heavy equipment and explosives to drop the bridge and dismantle the abutments. In this scenario, the impact on the Segment 2 soundscape environment would be short-term, moderate to major, and adverse.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 6, including parking improvements at Curry Village, Camp 6, and in the vicinity of Yosemite Lodge, and new lodging units and campsites at several locations, would require construction efforts that would produce construction noise.

Construction noise would have a short-term, moderate, adverse impact. New camping and parking facilities would result in long-term, minor impacts to soundscapes while the removal of campsites and parking would result in long-term, minor, beneficial impacts in other areas.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. Several of these actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. Facilities removal would reduce visitor-related noises within those project areas, while the construction of new units would have the opposite effect. The long-term impact on the soundscape environment would be local, negligible, and adverse.

**Camp 6 and Yosemite Village.** The park would expand the Concessioner Warehouse Building to accommodate Concessioner General Office functions, construct a pedestrian underpass and two roundabouts, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate and adverse. The majority of these actions would occur in a developed area, largely within the footprint of existing development. However, the increase in parking availability would likely increase visitor-related noise in the vicinity of the parking lot. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. The latter actions would require the use of heavy construction equipment and would increase construction-related traffic during project implementation. The resulting short-term impact on the soundscape environment would be local, minor to moderate, and adverse. The majority of these actions would occur in close proximity to existing development. As such, the long-term impact on the soundscape environment would be local, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have short-term, minor to moderate, adverse impacts on the soundscape environment, but would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on the soundscape environment.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Proposed actions to protect and restore areas around valley oaks in Segment 4, such as the demolition and removal of Odgers bulk fueling facility, would require the use of heavy equipment which would result in short-term, moderate, adverse impacts on Segment 4 soundscapes in the project vicinity.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Management actions to address facilities under Alternative 6, specifically new employee housing development, would temporarily increase noise from construction activity and project vehicles on nearby roadways. Heavy construction equipment and haul trucks would temporarily add to the noise environment in the project vicinity. Noise from demolition/construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria Flatt and Abbieville. The expected impact on Segment 4 soundscapes would be long-term, minor, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values within Segment 4 would have short-term, moderate, adverse impacts on soundscapes in the project vicinity, but would not be expected to have any long-term impacts. Actions to manage user capacities, land use, and facilities would have short- and long-term, minor, and adverse impacts on the soundscape environment within Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River, Wawona Impoundment, and Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Restoration activities, including relocation of two stock use campgrounds, would involve heavy equipment which would have a short-term, moderate, adverse impact in the vicinity of the action within Segment 7.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Elimination of the concessioner stable operations and day rides, and changes to visitor and administrative facilities, and various visitor access and transportation improvements in Segment 7 would require construction efforts that would result in short-term, minor to moderate, adverse impacts on soundscapes in the vicinity from construction noise. Reduced activity in the vicinity would contribute to a long-term, negligible, beneficial impact.

**Wawona Campground.** Under Alternative 6, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. Equipment required to remove these facilities would have short-term, moderate, adverse impacts on area soundscapes. However, the removal of campsites would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on the soundscape.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values within Segment 7 would result in local, long-term, minor, beneficial impacts. Actions to manage user capacity, land use, and facilities would reduce n long-term noise exposure, contributing to local, negligible, beneficial impacts on the soundscape environment.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The acoustical environment in Yosemite Wilderness would not be affected by actions associated with Alternative 6, but would continue to be shaped largely by natural sources of sound punctuated by intrusive noise generated by high-altitude aircraft overflights. The acoustical environment in nonwilderness areas would continue to be shaped primarily by noise, such as vehicles and recreational activities, and by natural sources of sound, such as rushing water and wind. Care should be taken to assess potential noise production from future uses. Temporary noise from restoration and construction operations would add to the noise environment, producing short-term, moderate, adverse noise impacts in construction areas. The construction of new facilities, namely housing and campgrounds, and parking lots would produce long-term, minor, noise impacts in the vicinity of such facilities. Increased visitation would similarly increase noise throughout Yosemite Valley. Overall, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3, as applicable (see Appendix C), noise would be increased relative to Alternative 1, resulting in a long-term, minor, adverse impact on soundscapes in the Merced River corridor.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The discussion of cumulative impacts on soundscapes is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of the actions common to Alternatives 2–6. The cumulatively considerable projects would be the same as those identified for Alternative 1, above, and include only those that could affect noise in the Merced River corridor or could be affected by noise sources in the corridor.

### ***Overall Cumulative Impact***

Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. Increased visitation, in combination with new facilities construction and operation, such as employee housing, would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities.

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## Air Quality

### *Affected Environment*

The primary factors that influence air quality are the locations of air pollutant sources, the types and amounts of pollutants emitted, meteorological conditions, and topographic features. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. Air quality in the Merced River corridor and potential impacts associated with the project alternatives are discussed below.

### Regulatory Context

Regulation of air pollution is achieved through both national and state ambient air quality standards and emissions limits for individual sources of air pollutants.

#### *Federal and State Ambient Air Quality Standards*

The Clean Air Act of 1970 (42 USC 7401 et seq.) tasked the U.S. Environmental Protection Agency (EPA) with establishing national ambient air quality standards (NAAQS) and periodically reassessing whether these standards are adequate to protect public health and the national welfare, including those resources and values associated with national parks and wilderness areas. The NAAQS set thresholds for *criteria pollutants*, including ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), suspended particulate matter (PM), and lead (Pb). Since that time, subsets of particulate matter have been identified for which permissible levels have been established. These include particulate matter of 10 microns in diameter or less (PM<sub>10</sub>) and particulate matter of 2.5 microns in diameter or less (PM<sub>2.5</sub>).

Under the 1988 California Clean Air Act, the California Air Resources Board has also adopted standards for these criteria pollutants (called California Ambient Air Quality Standards, or CAAQS) and applies additional standards for pollutants that are not currently included in the national standards. The federal and state ambient standards differ in some cases; in general, the California standards are more stringent, particularly for ozone and PM<sub>10</sub>. Both the EPA and the California Air Resources Board classify air basins in California as either in “attainment” or “nonattainment” with their respective standards. Areas that were once designated as nonattainment, but are now achieving the NAAQS, are termed “maintenance areas.” **Table 9-131** shows the current state and federal ambient air quality standards.

The federal government delegates the inventory of all criteria pollutants to the state, which performs this regulatory function and assesses air quality under NAAQS and CAAQS by inventorying emissions and regulating the concentrations of primary pollutants. Some of these standards contain both primary standards for human health and secondary standards for more indirect (e.g., ecological) endpoints, including acidification and eutrophication of lakes. The National Park Service (NPS) assists the State of California by measuring concentrations of pollutants and monitoring ecological endpoints to help evaluate the effectiveness of secondary NAAQS and CAAQS.



**TABLE 9-131: AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	State Standard	Federal Primary Standard	Federal Secondary Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	0.075 ppm	Same as primary standard	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/industrial mobile equipment
	1 hour	0.090 ppm	---		
Carbon Monoxide	8 hour	9.0 ppm	9.0 ppm	None	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	35 ppm		
Nitrogen Dioxide	Annual Average	0.030 ppm	0.053 ppm	Same as primary standard	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.180 ppm	0.100 ppm		
Sulfur Dioxide	Annual Average	---	---	--	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing
	24 Hour	0.04 ppm	---		
	3 Hour	---	---	0.5 ppm	
	1 Hour	0.25 ppm	0.075 ppm	--	
Particulate Matter (PM10)	Annual Arithmetic Mean	20 µg/m3	---	Same as primary standard	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, prescribed and wildland fires, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 µg/m3	150 µg/m3		
Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 µg/m3	15 µg/m3	Same as primary standard	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; prescribed and wildland fires; also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics
	24 hour	---	35 µg/m3		
Lead	Calendar Quarter	---	1.5 µg/m3	Same as primary standard	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.
	30-Day Average	1.5 µg/m3	---	---	
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard		Geothermal power plants, petroleum production and refining
Visibility-Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more			See PM2.5.
NOTE: ppm = parts per million; µg/m3 = micrograms per cubic meter; km = kilometers					
SOURCE: CARB 2009a, 2011a.					

### ***The State Implementation Plans***

The state and federal Clean Air Acts require nonattainment air districts to develop plans, known as State Implementation Plans (SIPs). SIPs are comprehensive plans that describe how the district would attain NAAQS. The 1990 amendments to the federal Clean Air Act set deadlines for attainment based on the severity of an area's air pollution problem. SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (e.g., monitoring, modeling, permitting), district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. State law makes the California Air Resources Board the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to the California Air Resources Board for review and approval. The California Air Resources Board forwards SIP revisions to the EPA for approval and publication in the Federal Register. The Code of Federal Regulations, title 40, chapter I, part 52, subpart F, section 52.220 lists all of the items that are included in the California SIP. At any one time, several California submittals are pending EPA approval.

The portion of the South Fork Merced River corridor within Yosemite National Park crosses into both Mariposa and Madera counties, which are located in the Mountain Counties Air Basin and the San Joaquin Valley Air Basin, respectively. The Mountain Counties Air Basin has been designated as nonattainment for state and federal ozone standards. Only the Yosemite National Park portion of Mariposa County is designated as nonattainment for the state PM<sub>10</sub> standard, primarily due to local sources near the Yosemite Valley Visitor Center monitoring site. Similarly, the San Joaquin Valley Air Basin has also been designated as nonattainment for state and federal ozone standards, state PM<sub>10</sub> standards, and state and federal PM<sub>2.5</sub> standards. The Mariposa County Air Pollution Control District (MCAPCD) is the regional agency responsible for rulemaking, permitting, and enforcement activities affecting stationary sources in Mariposa County. No air quality plans have been prepared for the Mariposa County portion of the Mountain Counties Air Basin. The state has not required an ozone plan because of the overwhelming influence of pollutant transport on ozone conditions in Mariposa County. With regard to the Madera County portion of the San Joaquin Valley Air Basin, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has developed air quality plans for 1-hour and 8-hour ozone, as well as for PM<sub>10</sub> and PM<sub>2.5</sub>.

### ***General Conformity***

Under the 1990 amendment to the Clean Air Act (section 176(c)(4)), a general conformity rule was established to ensure that actions taken by federal agencies in nonattainment areas conform to state goals for the attainment and maintenance of the NAAQS. In 1993 the EPA published guidance on this rule that assists federal agencies in deciding whether a conformity determination is required, and if so, how to make such a determination (EPA 1993). The general conformity rule is currently undergoing revision.

Management actions identified herein that would occur in Mariposa County would likely be subject to the General Conformity Rule, given that the county is now a nonattainment area for the national 8-hour ozone standard. The de minimus thresholds<sup>1</sup> for ozone are 50 tons per year of volatile organic

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<sup>1</sup> The minimum threshold for which a conformity determination must be performed.

compounds (VOC) and 100 tons per year of nitrogen oxides (NO<sub>x</sub>). Actions that would occur in Madera County are currently, and would continue to be, subject to the rule because the county lies in an area (San Joaquin Valley Air Basin) that has been designated as nonattainment for national ozone and PM<sub>10</sub> standards, which is the subject of the ozone SIP and a PM<sub>10</sub> SIP. As a result of the San Joaquin Valley Air Basin's recent designation as an extreme nonattainment area, the applicable de minimis standards for ozone are lower — 10 tons per year of VOC and 10 tons per year of NO<sub>x</sub>. With respect to particulates, Madera County's applicable de minimis threshold for PM<sub>2.5</sub> is 100 tons per year.

### *Mandatory Class I Areas*

In addition to the state and federal requirements described above for nonattainment areas, section 162(a) of the federal Clean Air Act sets forth additional provisions for the protection of air quality across certain federal lands, such as national parks, national wilderness areas, and national monuments. Yosemite National Park was designated as a Class I area in 1977. This designation gives Federal Land Managers (FLMs) the responsibility for protecting air quality related values (AQRVs) from the adverse impacts of new or modified sources of emissions. Generally, an AQRV is a resource, as identified by the FLM, that may be adversely affected by a change in air quality and may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the FLM for a particular federal area (NPS, 2011t). In order to achieve greater consistency in the approach each agency uses to identify and evaluate AQRVs, air resource managers from the U.S. Forest Service (USFS), the NPS, and the U.S. Fish and Wildlife Service (FWS) FLMs established the Federal Land Managers' Air Quality Related Values Work Group (FLAG) in order to:

- Define sensitive AQRVs,
- Identify the critical loads (or pollutant levels) that would protect an area and identify the criteria that define adverse impacts, and
- Standardize the methods and procedures for conducting AQRV analyses. (USFS et al. 2010)

AQRVs that have been identified for Yosemite National Park include visibility, pine (injury from ozone), high elevation lakes (acidity), and lichen (sensitive to vehicle-derived reactive nitrogen deposition) (Tarnay 2012).

In 1999, the EPA published a regional haze rule to guide the preparation of state regional haze plans to improve air quality and reduce haze in Class I federal areas. The ultimate goal of the rule is to restore natural visibility conditions in Class I areas, such as Yosemite National Park, by 2064. Under the regulations, all states are required to develop implementation plans that demonstrate reasonable progress toward this goal. In January of 2009, the California Air Resources Board adopted the *California Regional Haze Plan*, which sets forth specific visibility goals for the state. The plan is part of a broader multi-state effort to improve visibility throughout the western region. The plan details baseline conditions of individual Class I areas, including Yosemite National Park, and sets a path toward achieving interim, reasonable progress goals statewide by 2018 (CARB 2009b). The El Portal Administrative Site is located within a Class II area, in which less stringent standards apply.

## ***Federal Policies***

**Executive Order 13423, Issued by President George W. Bush, Jan. 24, 2007.** This executive order sets as a policy of the United States that “Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner” (section 1, Policy). Goals for agencies include such measures as improving energy efficiency and reducing greenhouse gases generated by agency operations and actions, reducing energy intensity and requiring that energy consumed by the agency comes from new renewable sources, reducing water consumption, and ensuring that agencies reduce their fleet’s total consumption of petroleum products (NPS 2007h).

## ***National Park Service Management Policies***

The NPS has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act. Accordingly, the service would seek to perpetuate the best possible air quality in parks to (1) preserve natural resources and systems; (2) preserve cultural resources; and (3) sustain visitor enjoyment, human health, and scenic vistas. Through the *NPS Management Policies 2006*, the park has committed to actively promoting and pursuing measures to protect AQRVs from the adverse impacts of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the park would err on the side of protecting air quality and related values for future generations (NPS 2006a).

It is also NPS policy that internal activities at parks must comply with all applicable federal, state, and local air pollution laws and regulations (NPS 2004a). To meet these goals, parks may be required to obtain air quality permits before conducting activities, such as prescribed burning, that emit pollutants. Likewise, operating permits may be required for some emission sources, such as wastewater treatment facilities.

## **Environmental Context**

### ***Climate and Meteorology***

California is divided into air basins that are defined partly by their meteorological and topographical characteristics. As previously noted, the portions of the Merced River and South Fork Merced River that traverse Yosemite National Park are located within two air basins: Mountain Counties Air Basin and San Joaquin Valley Air Basin. Generally, the uppermost reaches of the Merced River and South Fork Merced River lie within San Joaquin Valley Air Basin, and the lower reaches lie within Mountain Counties Air Basin.

The portions of the Merced River and South Fork Merced River that traverse the park lie within the Sierra Nevada mountain range, which roughly parallels the eastern boundary of California and extends from the Cascades Range in the north to the Tehachapi Mountains in the south. Cooler climates with more wind are, in general, characteristic of the mountains, as contrasted with the nearby valleys. Mountain climatic zones are characterized by considerable vertical wind motion and by winds and temperatures different from those in the valleys. The Yosemite Valley, for instance, experiences

inversions, which occur when air temperature increases with altitude. Flat topography traps descending cold air at night, creating a shallow inversion layer that inhibits air pollutant dispersion and results in high pollutant concentrations.

### *Air Quality Monitoring Data*

Federal, state, and local agencies operate a network of monitoring stations throughout California to collect data on ambient concentrations of air pollutants. **Table 9-132** summarizes recent monitoring data from the monitoring stations in the project vicinity. Three of the stations are in Yosemite National Park (Turtleback Dome, Merced River, and Yosemite Valley Visitor Center) and one is outside of the park, in the Sierra National Forest (Jerseydale). The Merced River, Yosemite Valley Visitor Center (in Yosemite Village), and Jerseydale stations are approximately 4,000 feet above sea level, and Turtleback Dome is approximately 5,300 feet above sea level. As shown in table 9-131, exceedances of state and national standards for ozone and PM10 are recorded on occasion within the park and in the park vicinity.

**Ozone.** Ozone is a reactive pollutant that is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides (NOx). These pollutants are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources but is formed downwind of sources of VOC and NOx. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate respiratory diseases such as asthma, bronchitis, and emphysema. Exposure to ozone is also associated with a wide range of effects on vegetation AQRVs, such as visible foliar injury, growth reductions and yield loss in annual crops, growth reductions in tree seedlings and mature trees, and effects that can have impacts at the forest stand and ecosystem level (EPA 1997).

**Particulate Matter (PM10 and PM2.5).** PM10 consists of particulate matter that is 10 microns or less in diameter (a micron is 1 one-millionth of a meter), and PM2.5 consists of particulate matter 2.5 microns or less in diameter. Both PM10 and PM2.5 can be inhaled into the air passages and the lungs and can cause lung irritation, but PM2.5 can penetrate more deeply into alveolar passages where diffusion into the blood stream is possible, which can result in additional adverse cardiovascular health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. For instance, in Mariposa County, the principal sources of direct emissions of PM10 include entrainment of dust through vehicle travel over paved and unpaved roads, residential fuel combustion, and wildfires. However, PM10 and PM2.5 concentrations also reflect secondary pollutant formation derived from photochemical reactions involving pollutants such as VOC and NOx. As described above in connection with ozone, on-road motor vehicles are a principal source of regional VOC and NOx emissions.

**TABLE 9-132: AIR QUALITY DATA SUMMARY (2006-2010) FOR THE STUDY AREA**

Pollutant	Standard <sup>a</sup>	Monitoring Data by Year				
		2006	2007	2008	2009	2010
Ozone (Yosemite National Park — Turtleback Dome Station)						
Highest 1-Hour Average (ppm) <sup>b</sup>	0.09	0.100	0.100	0.108	0.096	0.091
Days over State Standard		4	3	11	1	0
Highest 8-Hour Average (ppm) <sup>b</sup>	0.07	0.094	0.097	0.102	0.086	0.085
Days over State Standard		52	49	56	8	23
Days over National Standard	0.075	30	25	33	26	5
Ozone (Sierra National Forest — 6440 Jerseydale)						
Highest 1-Hour Average (ppm) <sup>b</sup>	0.09	0.101	0.099	0.108	0.096	0.109
Days over State Standard		3	1	5	1	2
Highest 8-Hour Average (ppm) <sup>b</sup>	0.07	0.092	0.092	0.093	0.084	0.101
Days over State Standard		41	26	30	18	6
Days over National Standard	0.075	13	12	17	5	3
Particulate Matter (PM10) (Yosemite Village — Visitor Center)						
Highest 24-Hour Average – State/National (µg/m <sup>3</sup> ) <sup>b</sup> Highest 1-Hour Average, ppm <sup>c</sup>		97.0	116.0	118.4	82.2	74.3
Estimated days over State Standard <sup>c</sup>	50	2	1	2	3	2
Estimated days over National Standard <sup>c</sup>	150	0	0	0	0	0
State Annual Average <sup>d</sup>	20	NA	NA	NA	23.6	20.3
Particulate Matter (PM2.5) (Yosemite Village — Visitor Center)						
Highest 24-Hour Average – National (µg/m <sup>3</sup> ) <sup>b</sup> Highest 1-Hour Average, ppm <sup>c</sup>		36.1	134.0	130.1	47.2	61.0
Estimated days over National Standard <sup>c</sup>	35	NA	NA	NA	NA	NA
State Annual Average <sup>d</sup>	12	NA	14.2	NA	NA	NA
National Annual Average <sup>d</sup>	15	NA	NA	NA	NA	NA
NOTE: NA = Adequate data was not available. Values in bold exceed the respective air quality standard.						
<sup>a</sup> Generally, state standards are not to be exceeded and federal standards are not to be exceeded more than once per year.						
<sup>b</sup> ppm = parts per million; µg/m3 = micrograms per cubic meter.						
<sup>c</sup> PM10 and PM2.5 are not measured every day of the year.						
<sup>d</sup> State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.						
SOURCE: CARB 2011b						

On occasion, concentrations of PM<sub>10</sub>/PM<sub>2.5</sub> in the park reflect pollutant transport from upwind areas, such as San Joaquin Valley Air Basin; under other conditions, ambient concentrations reflect local sources such as campfires, entrainment of dust from vehicle movement over paved roads (particularly from wintertime sanding of roads for traction), and wildland and prescribed fires. Regional emissions of PM<sub>10</sub>/PM<sub>2.5</sub> and their precursors within the San Joaquin Valley are expected to decrease over the next decade or so, largely as a result of reductions in emissions due to state and federal motor-vehicle emissions control standards and programs. Local emissions of PM<sub>10</sub>/PM<sub>2.5</sub> would continue to be proportional to the number of campsites; the level of construction-related activity; the extent of vehicle travel on park roads; and the frequency and extent of prescribed fires.

**Visibility-Reducing Particles and Gases.** Visibility impairment occurs as a result of the scattering and absorption of light by particles and gases in the atmosphere. Both primary and secondary formations of particles contribute to visibility impairment. Primary particles, such as elemental carbon from diesel and wood combustion or dust from certain industrial activities or natural sources, are emitted directly into the atmosphere. Secondary particles that are formed in the atmosphere from primary gaseous emissions include sulfate from sulfur dioxide emissions, nitrates from NO<sub>x</sub> emissions (which can also adversely impact lichen AQRVs from nitrogen deposition), and organic carbon particles formed from VOC emissions. The only primary gaseous pollutant that directly reduces visibility is nitrogen dioxide, which is the brown-colored gas readily visible during periods of heavy air pollution.

Visibility conditions are commonly expressed in terms of three mathematically related metrics: visual range, light extinction, and deciviews. Visual range is the maximum distance at which one can identify a black object against the horizon and is typically described in miles or kilometers. Light extinction, which is inversely related to visual range, is the sum of light scattering and light absorption by particles and gases in the atmosphere and is expressed in terms of inverse megameters, with large values representing poorer visibility. Unlike visual range, the light extinction coefficient expresses the relative contribution of one particulate constituent (e.g., sulfates or nitrates) versus another to overall visibility impairment. The deciview metric was developed because changes in visual range and light extinction are not proportional to human perception. For example, a 5-mile change in visual range can be either very apparent or not perceptible, depending on the baseline level of ambient pollution. The deciview metric provides a linear scale for perceived visual changes over the entire range of conditions, from clear to hazy, analogous to the decibel scale for sound. Under many scenic conditions, a change of 1 deciview is considered to be perceptible by the average person. A deciview of zero represents pristine conditions.

Current visibility impairment in Yosemite National Park ranged from 4.6 deciviews for the clearest 20% of days during the 1990–1999 period, to 22 deciviews for the haziest 20% of days during that period (NPS 2002). In contrast, the corresponding range of deciview values was 3.9 (clearest 20%) to 13.9 (haziest 20%) and 13.6 to 31.8 in Rocky Mountain National Park and Great Smoky Mountains National Park, respectively. Yosemite National Park visibility for the clearest 20% of days is much better than the NPS average, whereas visibility for the haziest 20% of days is about average. Organic carbon, elemental carbon, crustal matter (fugitive dust originating from the earth's crust), nitrates, and sulfates are primarily responsible for visibility impairment in Yosemite Valley.

**Emission Sources.** Sources of pollution generally fall into one of three categories: stationary, mobile, or area. Stationary sources refer to emissions sources associated with industrial or commercial processes. Mobile sources refer to on-road and off-road vehicles, among other nonstationary sources. Area sources refer to a wide range of sources that are individually minor, but are more substantial in aggregate. A summary of the potential emissions sources within the project area, arranged by source category, is shown in **table 9-133**.

While air quality in a given air basin is usually determined by emission sources within the basin, it also can be affected by pollutants transported from upwind air basins by prevailing winds. A study of surface ozone in the summers of 2003 and 2005 identified the San Francisco Bay Area and eastern Nevada to be contributing sources of ozone pollution (Burley and Ray 2007). A similar study examined the potential sources of fine particulate matter within the park during the summer of 2002 and found



**TABLE 9-133: POTENTIAL EMISSIONS SOURCES WITHIN THE PROJECT AREA**

Stationary Sources	
Air conditioners and refrigeration units	Wastewater Treatment Plants
Food Preparation (e.g., grills, stoves)	Storage Tanks
Commercial/Institutional Boilers, Heaters, and Fireplaces	Stationary Pumps/Compressors/Generators
Mobile Sources	
Landscape maintenance equipment	NPS snowmobiles
NPS aircraft	NPS on-road vehicles
Visitor vehicles	Buses
Area Sources	
Landscape maintenance equipment	Campfires
Welding	Charcoal and lighter fluid consumption
Demolition activities	Consumer solvents
Road Maintenance	Dust from paved roads
Prescribed and Wild Fire	LPG Gas Combustion
Herbicides/pesticides	Solvent Use
Livestock	Surface Coating (e.g., paints/solvents)
Waste disposal	Woodworking/wood finishing
NPS = National Park Service; LPG = liquefied petroleum gas SOURCE: NPS 1999d	

that although local sources contributed, wildfires as far away as western and southern Oregon were primarily responsible for haze within Yosemite National Park during that summer (McMeeking et al. 2006). The California EPA concluded that all of the ozone exceedances in 1995 in the southern portion of the Mountain Counties Air Basin (i.e., Tuolumne and Mariposa counties) were caused by transport of ozone and ozone precursors from the San Joaquin Valley Air Basin (CARB 1996).

### ***Sensitive Receptors***

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. Population subgroups sensitive to the health effects of air pollutants include the elderly and the young; population subgroups with higher rates of respiratory disease, such as asthma and chronic obstructive pulmonary disease; and populations with other environmental or occupational health exposures (e.g., indoor air quality) that affect cardiovascular or respiratory diseases.

Such land uses and facilities as schools, children's day care centers, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Parks and playgrounds are considered moderately sensitive to poor air quality because persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality;

however, exposure times are generally far shorter in parks and playgrounds than in residential locations and schools, which typically lessens overall exposure to pollutants. Residential areas are considered more sensitive to air pollution conditions compared with commercial and industrial areas because people generally spend longer periods of time at their residences, with associated greater exposure to ambient air pollution conditions. Sensitive receptors within the project area include on-site staff and recreational users, specifically the elderly and the young, within developed areas of the Merced River corridor, including Yosemite Valley, Wawona, and El Portal. In addition to human sensitive receptors described above, there are also sensitive ecological receptors in the Yosemite National Park, such as pine and lichen AQRVs, which are susceptible to adverse effects from elevated ozone exposure and nitrogen deposition, respectively.

### *Environmental Consequences Methodology*

Local sources of emissions would have minimal effect on regional emissions, particularly during the summer season when regional emissions meet or exceed federal and state standards. The exceptions would be wildland and prescribed fires, which can result in regionally significant emissions on a given day. Other local emissions sources include stationary, area, and mobile sources. The air quality impact assessment involves the identification and qualitative description of the types of actions under the various alternatives that could affect air quality, sensitive receptors and AQRVs, corresponding emissions sources and pollutants, and relative source strengths. In addition, quantitative criteria pollutant emission estimates were developed for on-road vehicular traffic for each Alternative. Based on the relative source strengths, an assessment was performed to determine the potential for higher pollutant emissions or concentrations, taking into account the frequency, magnitude, duration, location, and reversibility of the potential impact. Regional pollutant transport issues were evaluated in the context of regional cumulative impacts. The criteria that follow are used to determine these impacts.

- **Context.** The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the Merced River corridor. Regional impacts would be those related to the Mountain Counties Air Basin (MCAB) and San Joaquin Valley Air Basin (SJVAB). With respect to air quality issues, both local and regional perspectives are relevant.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts would be effects considered not detectable and would have no discernible effect on air quality (assumed to be 1% or less of threshold). Minor impacts would be those that are present, but not expected to have an overall effect on those conditions (assumed to occur up to 50% of the applicable threshold). Moderate impacts would be clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on local or regional air quality (assumed to occur when emissions exceed applicable threshold).

Quantitative thresholds that would apply to each river segment within the project area's respective air basins (i.e., MCAB and SJVAB) are described below. Notably, a major impact would occur if emissions exceed these thresholds.

Actions that would occur in the Mariposa County portion of the MCAB would be subject to:

Federal General Conformity Rule de minimis thresholds:

- 50 tons per year VOC or ROG
- 100 tons per year NO<sub>x</sub>

Actions that would occur in the Madera County portion of the SJVAB would be subject to:

Federal General Conformity Rule de minimis thresholds:

- 10 tons per year VOC or ROG
- 10 tons per year NO<sub>x</sub>
- 100 tons per year PM<sub>2.5</sub>

Notably, only one action — reroute Triple Peak Fork Trail upland where possible — in Segment 1, which is common to Alternatives 2–6, would occur in Madera County.

- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of impacts. A long-term impact would have a permanent effect on air quality.
- **Type of Impact.** Impacts are evaluated in terms of whether they would be beneficial or adverse to air quality. Beneficial air quality impacts would reduce emissions or lower concentrations, and adverse impacts would have the opposite effect.

### *Environmental Consequences of Alternative 1 (No Action)*

Under Alternative 1 (No Action), no policies that protect or enhance air quality in the corridor would be developed. Policies and actions that protect and enhance air quality in the corridor arise not from the Wild and Scenic Rivers Act but from such laws as the federal Clean Air Act. Alternative 1 would continue the current management direction and level of management intensity in the Merced River corridor. Lodging, camping, infrastructure, and parking would continue in the same locations, configurations, and at the same level of development. There would be no comprehensive approach to protect and enhance river values.

Under Alternative 1, air quality in the Merced River corridor would continue to be influenced by local pollution sources within the park and by regional sources upwind of the park. Local emissions sources include stationary, area, and mobile sources. Local air quality varies based on temperature, humidity, wind speed, elevation, topography, and other environmental factors, such as regionwide conditions. Generally, the effects of local emissions sources would be most intense in those areas where the sources are concentrated and can be compounded by inversions, such as in the Yosemite Valley. Analysis of effects is qualitative, and professional judgment was applied to reach reasonable conclusions as to the context, intensity, and duration of potential impacts.

### **All River Segments**

Impacts of wildland and prescribed fires would continue to be controlled through implementation of smoke management policies in the *2004 Fire Management Plan/EIS*. These policies are intended to minimize impacts on air quality from prescribed burning within the park and region. It should be noted that while wildland fire drives the largest and most intense exceedances of particulate matter

standards in the Merced River corridor, as is the case in Yosemite Valley, the baseline levels of particulate emissions are already high. Several assumptions were integrated into this assessment.

- Alternative 1 (No Action) would not affect the smoke management policies in the *Fire Management Plan/EIS*.
- Alternative 1 would not create campfire regulations specific to the project area.
- The NPS would continue to ensure that all stationary emissions sources under its control or under the control of its concessioners comply with applicable air district rules and regulations.
- The NPS would continue to participate in the regional air quality planning processes for ozone and visibility impairment and would continue to review applications for new or modified major stationary sources upwind of the park, pursuant to the Prevention of Significant Deterioration regulations.
- The NPS would comply with the EPA's general conformity rule for any future actions that would occur within Mariposa and Madera counties, which are part of MCAB and SJVAB, respectively.

In accordance with the 2009 Settlement Agreement, no new structures would be constructed in the Merced River corridor, except for minor structures that are small, temporary, easily removed, not habitable; designed to support existing uses, systems, and programs; located within the existing building footprint; and not created solely for commercial purposes. Temporary housing for employees displaced by the 2008 rockfall would continue as needed at Huff House, Lost Arrow, Yosemite Lodge, Ahwahnee Dorm, Boys Town, and El Portal Trailer Village, and for NatureBridge students at Curry Village. Housing for NPS employees and park partner staff would remain in current locations and at current levels.

Alternative 1 accounts for 3% growth in visitation following recent trends. It is expected that more days during the peak season would receive the visitation currently experienced during the busiest days. Visitation could also increase in the off-peak seasons. Consequently, traffic congestion and associated air pollutant emissions during those nonpeak periods could approximate current congestion during peak periods. Increases in visitation during peak periods could also occur, and to the degree that such increases do happen, traffic congestion and air pollutant emissions would marginally increase. These local mobile sources would continue to include automobiles, trucks, and buses, and would remain subject to state and federal emissions control standards and programs. For the foreseeable future, motor vehicle fleet turnover, cleaner burning fuels, improved technologies, and stricter state and federal standards would be expected to decrease emissions per vehicle-mile-traveled (VMT). Thus, the overall impact of mobile source exhaust emissions would remain approximately the same as under existing conditions. Regional AQRV impacts (such as pine injury from ozone and visibility) would also be approximately the same as under existing conditions. However, in contrast to the ozone precursors, most of the particulate matter associated with vehicle use is related to entrainment of road dust rather than to exhaust. Emissions from vehicle entrainment of road dust would continue to affect air quality, particularly in winter and early spring, when drying road surfaces expose sand deposited for traction to vehicle entrainment into the atmosphere. However, even with the anticipated annual increase in visitation, the effect would be negligible. Were visitation to increase, road dust would be expected to increase in rough proportion to VMT within the park, as would those emissions associated with traffic

congestion and delays that would accompany such increases. Under the latter scenario, the effect on local air pollution conditions would be long term, minor, and adverse.

Park management has implemented temporary access restrictions for use when traffic and parking conditions in Yosemite Valley are overly congested. This has the effect of reducing the number of incoming vehicles and their related emissions until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as departing visitors leave the Valley) to stabilize traffic conditions. These access restrictions occur when traffic in Yosemite Valley is at maximum capacity, and thus associated vehicle pollutant emissions would also be at peak levels. In addition, the Yosemite Area Regional Transportation System (YARTS) would continue to reduce the number of individual vehicles operated within the park. In 2011, YARTS transported 300,979 passengers into Yosemite National Park (NPS, 2012i). The intent of YARTS is to provide an attractive alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park.

Local area pollution sources would continue to include regular maintenance activities, consumer products, natural gas combustion for heating/cooling and campfires. Most of these sources would continue in the same manner and extent as under existing conditions. However, potential future increases in visitor use levels would cause these sources to increase in relative proportion. Daily, routine, and intermittent operational maintenance intended to stabilize and protect park facilities, address visitor health and safety issues, and protect natural and cultural resources would continue, such as campground maintenance, road and trail maintenance, building and grounds maintenance, and utility system repair and maintenance throughout Segments 1–8. Trail and road maintenance would preserve the existing character, so that parking areas or trails that are currently unpaved remain so. Park facilities themselves — roads, parking spaces, bridge crossings, and overnight accommodations — would remain as they were in 2010. Campfires would continue to be subject to park regulations, and related emissions could increase in proportion to the increased visitation, especially during nonpeak periods.

#### **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

Wilderness and impoundment Segments 1, 5, 6, and 8 would be minimally affected by local emissions sources, with the exception of wildland and prescribed fires, or the occasional campfire from overnight visitors. Impacts from prescribed burning would continue to be controlled through implementation of smoke management policies in the *Fire Management Plan/EIS*. Although there are no transportation facilities in Segments 1, 5, 6, or 8, and none are proposed under Alternative 1, incidental future increases in traffic within the Merced River corridor would affect these segments by pollutant drift. In addition, impacts from in-park emissions, such as vehicles, would be more apparent in areas near road corridors and concentrations of visitor and administrative services. The overall effect on regional air pollution conditions would be long term, minor, and adverse.

**Segments 1, 5, 6, & 8 Impact Summary:** Implementation of Alternative 1 (No Action) would result in local, long-term, minor, adverse air quality impacts within these segments.

## Segment 2: Yosemite Valley

As described above, for Segments 1–8 there could be adverse air quality impacts associated with transportation conditions under Alternative 1. Specific to Segment 2, there would likely continue to be local, minor, long-term, adverse air quality impacts associated with traffic congestion and delays that would continue to occur at busy intersections in Yosemite Valley and possibly increase should visitation levels increase in the future. Traffic emissions, as a source of nitrogen deposition, are also correlated to lichen AQRVs and would also likely result in long-term local, minor, adverse air quality impacts. Park management may continue to implement temporary access restrictions in Yosemite Valley when westbound traffic is backed up from Lower Yosemite Fall to the Curry Village four-way intersection or when all of the day parking spaces have been filled.

The effect on air quality from existing stationary sources, such as fuel storage systems and generators, would be greatest immediately adjacent to the emission source, including employee housing areas, visitor facilities, and lodging. Emissions from stationary sources would continue to be regulated, as appropriate, through applicable MCAPCD regulations. In the long term, the replacement of dated equipment (e.g., generators) with newer, more energy-efficient models to meet NPS sustainability goals would result in regional and local long-term, negligible, beneficial impacts.

Area emissions would continue to affect air quality and visibility within the Yosemite Valley under certain meteorological conditions. For example, particulate matter resulting from burning wood could remain near ground level during temperature inversions. Area sources of particulate matter in the Valley are the most important driver for the PM<sub>10</sub> nonattainment status due to the strength and frequency of inversions. The majority of overnight visitor accommodations, and their associated campfires and other sources of evening smoke, are located within Segment 2. Campfires would continue to be subject to park regulations, and related emissions could increase in proportion to the increased visitation, especially during nonpeak periods. Campfires or other evening sources of smoke would continue to affect local air quality at levels that may be unhealthy for sensitive groups, including individuals with pulmonary or cardiovascular diseases, the elderly, and children. Since wood smoke can currently contribute enough local emissions to create unhealthy pollutant levels for sensitive groups, especially through many wood-burning sources operating under stable atmospheric conditions, the expected increase in the usage of campfires under Alternative 1 would have a potentially long-term, moderate, adverse impact on sensitive receptors within Segment 2. Increased usage of campfires would also result in a potentially long-term, local, moderate, adverse impact if the usage results in increased PM<sub>10</sub> measurements above the ambient air quality standard at the Yosemite Valley Visitor Center monitoring site.

**Segment 2 Impact Summary:** Implementation of Alternative 1 (No Action) would result in local, long-term, minor, adverse air quality impacts associated with vehicle emissions. Air quality within the segment would also experience long-term, moderate, adverse impacts from campfires and other evening sources of smoke.

### **Segments 3 and 4: Merced River Gorge and El Portal**

Segments 3 and 4 would continue to be affected by local and regional sources of air pollutants, as described above for Segments 1–8. There are no NPS overnight accommodations along Segments 3 and 4, and thus few campfires or other visitor-related evening sources of smoke. As described above, were visitation to increase, road dust would be expected to increase in rough proportion to VMT within the park, as would those emissions associated with traffic congestion, which would result in long-term, local, minor, adverse impacts.

**Segments 3 & 4 Impact Summary:** Implementation of Alternative 1 (No Action) would result in local, long-term, minor, adverse air quality impacts within Segments 3 & 4.

### **Segment 7: Wawona**

As described above for Segments 1–8, there could be regional, long-term, minor, adverse air quality impacts associated with transportation conditions under Alternative 1. Specific to Segment 7, there could be local, long-term, minor, adverse air quality impacts associated with traffic congestion and delays that would continue to occur at busy intersections in Wawona, and possibly increase should visitation levels increase in the future. Traffic emissions, as a source of nitrogen deposition, are also correlated to lichen AQRV impacts and would also likely result in local, long-term, minor, adverse air quality impacts. Park management may continue to implement temporary access restrictions in Wawona when all of the day parking spaces have been filled.

The effect on air quality from existing stationary sources, such as fuel storage systems and generators, would be greatest immediately adjacent to the emission source, including the Wawona Store and Wawona Hotel. Emissions from stationary sources would continue to be regulated, as appropriate, through applicable MCAPCD regulations. In the long term, the replacement of dated equipment (e.g., generators) with newer, more energy-efficient models to meet NPS sustainability goals would result in regional and local, long-term, negligible, beneficial impacts.

Campfires would continue to be subject to park regulations, and related emissions could increase in proportion to the increased visitation, especially during nonpeak periods. Since wood smoke can currently contribute enough local emissions to create unhealthy pollutant levels for sensitive groups, especially through many wood-burning sources operating under stable atmospheric conditions, the expected increase in the usage of campfires under Alternative 1 would have a potentially long-term, local, moderate, adverse impact on sensitive receptors.

**Segment 7 Impact Summary:** Implementation of Alternative 1 (No Action) would result in local, long-term, minor, adverse air quality impacts associated with vehicle emissions. Air quality within the segment would also experience long-term, moderate, adverse impacts from campfires and other evening sources of smoke.



### Summary of Alternative 1 (No Action) Impacts

Under Alternative 1, air quality in the Merced River corridor would continue to be influenced by local pollution sources within the park and by regional sources upwind of the park. The relative importance of local and regional sources would continue to vary by season, diurnally, and by pollutant.

Furthermore, nonwilderness portions of the corridor would be affected by local emissions sources to a much greater extent than wilderness portions. Local stationary sources would continue to be regulated under the MCAPCD rules and regulations, some local area sources would continue to be subject to park regulations, and mobile sources would continue to be subject to state and federal tailpipe emissions standards. With respect to ozone precursors, overall local emissions under Alternative 1 would be similar to existing conditions. AQRV impacts (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be approximately the same as under existing conditions. With no increase in visitation or VMT within the corridor, the effect of particulate matter on air quality would be negligible. However, should VMT increase by 3%, the long-term impacts would be minor and adverse.

### Cumulative Impacts of Alternative 1 (No Action)

Cumulative effects on air quality discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of Alternative 1. The projects identified below include only those that could affect air quality within the study area or that could be affected by air pollutant sources within the Merced River corridor.

#### *Past Actions*

Past actions have resulted in both adverse and beneficial impacts on air quality. The majority of past projects listed in Appendix C (Cumulative Actions) had short-term, regional and local adverse impacts on air quality resulting from temporary construction activities (i.e., associated with ozone precursors from equipment and motor vehicle exhaust, as well as fugitive dust from ground-disturbing activities and vehicular travel over paved and unpaved roads), which have no net adverse or beneficial impacts on current or future air pollution conditions. The following past projects had long-term, minor, beneficial impacts on transportation and associated regional and local air pollution conditions, which would continue under Alternatives 2–6.

The **Yosemite Area Regional Transportation System** is a regional transportation system, established in 2000, whose intent is to provide an alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also provides a means for visitors to travel to Yosemite Valley when restricted access measures are implemented for private vehicles during times of severe congestion. In 2011, YARTS transported 300,979 passengers into Yosemite National Park (NPS, 2012i). This regional transportation system has a regional and local, long-term, negligible beneficial impact by reducing the number of day visitors arriving in private vehicles.

**Housing Projects** (i.e., Curry Village Employee Housing, Curry Village Huff House Temporary Housing, Yosemite Valley Lost Arrow Temporary Employee Housing, and Yosemite Valley Ahwahnee

Temporary Employee Housing) included the construction of housing and related facilities to accommodate concessioner employees. The housing units replaced concessioner housing lost in the January 1997 flood and the rockfall events at Curry Village in October 2008, and were developed in consultation with litigants as part of a settlement agreement concerning the 2005 *Merced Wild and Scenic River Comprehensive Management Plan*. These actions provide temporary lodging for concessioner employees, and are needed to help meet immediate short-term housing needs for the park concessioner until permanent employee housing is available. Construction was completed between 2007 and 2009. Construction of housing units resulted in regional and local, short-term, minor, adverse impacts. Over the long-term, since the housing replaced lost units to maintain capacity, there would be no net adverse or beneficial impacts on current or future air pollution conditions.

**Yosemite Valley Shuttle Bus Stop Improvements** involved the preparation of preliminary design plans, environmental compliance documents, and construction drawings; the construction of six 10-foot by 80-foot concrete braking pads; the rehabilitation or replacement of 94,000 square feet of asphalt road approaches; and the construction of bus stop shelters. Construction was completed in 2010. These improvements support shuttle bus service in Yosemite Valley, a local, long-term, minor, beneficial impact.

**Hybrid Electric-Diesel Shuttle Bus Procurement** consisted of the purchase of diesel hybrid transit buses by the NPS. Hybrid bus operations result in regional and local long-term, negligible benefits related to fuel usage and air pollutant emissions compared with diesel-only buses (NPS 2005C).

### ***Present Actions***

Present actions proposed in the region are separated below into four general categories: (1) projects anticipated to have a net beneficial impact, (2) projects anticipated to have both beneficial and adverse impacts, (3) projects anticipated to have adverse impacts, and (4) projects anticipated to have a no-net adverse or beneficial impact.

Present projects that could have a corridorwide, long-term, minor, beneficial, cumulative impact on air quality include:

- *2004 Fire Management Plan/EIS* smoke management policies
- The following projects would individually, and in combination, encourage travel to the park by alternative (nonprivate vehicle) modes, and would manage traffic and parking to reduce congestion and associated air pollutant emissions:
  - Increased Yosemite Area Regional Transportation System services
  - Changeable electronic signs in Mariposa, Midpines, and El Portal, alerting drivers to traffic conditions in Yosemite Valley
  - Computer-aided Dispatch/Automatic Vehicle Locator
  - Software design and purchase to process raw data from vehicle counters to produce useful information for visitors on parking and traffic conditions

Restricted access measures would continue to control the volume of incoming vehicles when traffic and parking conditions in Yosemite Valley are overly congested. The YARTS would continue to provide an alternative to individual private vehicles operated within the park.

Present projects that could have a short-term, adverse impact due to construction activities, but a long-term, beneficial, cumulative impact on traffic-related air quality include

- South Park Intelligent Transportation System: electronic signs and automatic vehicle counters at entrance stations and parking lots to know when parking lots are full
- Parking alternative option at the El Portal Maintenance Facility
- Parkwide Communication Data Network (CDN) infrastructure upgrade

Although the above projects would have some site-specific, short-term, adverse impacts (e.g., construction-related air pollution), the general goal of each of these projects is to improve transportation circulation, which would also improve the associated air quality.

Present projects that could have a short-term, adverse impact on air quality include all projects not mentioned above that include some temporary construction activities. There would be no net, long-term, adverse or beneficial impacts on air quality from these projects.

#### *Reasonably Foreseeable Future Actions*

Similar to past actions, reasonably foreseeable future actions would result in both adverse and beneficial impacts on air quality. Reasonably foreseeable future projects that could have a long-term, beneficial, cumulative impact on air quality include:

- Transit Passenger Information System

Other beneficial impacts for reasonably foreseeable future actions are similar to those discussed for past and present actions (i.e., the restricted access measures and increased Yosemite Area Regional Transportation System services). Reducing traffic congestion and encouraging travel to the park by alternative (nonprivate vehicle) modes would have regional and local, long-term, negligible beneficial impacts on air quality.

Reasonably foreseeable future actions that could have a short-term, adverse impact on air quality include all projects that include some temporary construction activities. There would be no-net, long-term, adverse or beneficial impacts on air quality from these projects.

Human activities (e.g., suburban growth, industry, transportation, farming and ranching) in the San Joaquin Valley, San Francisco Bay Area, and Sierra foothills continue to create air quality impacts that occasionally violate federal standards, particularly for ozone and for particulates. Some of these pollutants disperse into the Yosemite area, affecting the park's air quality and visibility. These adverse impacts are expected to continue for the foreseeable future with anticipated population growth.

### ***Overall Cumulative Impact***

Because Alternative 1 would not involve substantial construction projects, it is not anticipated to contribute to short-term, adverse impacts on air quality resulting from construction activities. Continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.

Over the long term, with respect to ozone, conditions in the Merced River corridor would be determined almost entirely by regional emissions trends instead of by local emissions sources under Alternative 1. The regional, long-term impact would most likely be minor and beneficial, owing to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. With respect to particulate matter, conditions in the corridor would be determined by both regional sources and local sources, and the relative influence of these two types of sources would vary from day to day and season to season. Under Alternative 1, with visitation assumed to remain constant, impacts from particulate matter would be negligible. However, if visitation or VMT within the corridor were to increase, particulate matter would be expected to increase in rough proportion to VMT (owing to entrainment of dust), which would have a local, long-term, minor, adverse impact on air pollution conditions. The increased usage of campfires would result in a long-term, local, moderate, adverse impact on air pollution conditions.

### ***Environmental Consequences of Actions Common to Alternatives 2–6***

For Alternatives 2–6, as described above for Alternative 1 (No Action), emissions from wildland and prescribed fires would continue to be controlled through implementation of smoke management policies in the *Fire Management Plan/EIS*. These policies are intended to minimize impacts on air quality from prescribed burning within the park and region. Several assumptions were integrated into this assessment.

- Alternatives 2–6 would not affect the smoke management policies in the *Fire Management Plan/EIS*.
- Alternatives 2–6 would not create campfire regulations specific to the project area.
- The NPS would continue to ensure that all stationary emissions sources under its control or under the control of its concessioners comply with applicable air district rules and regulations.
- The NPS would continue to participate in the regional air quality planning processes for ozone and visibility impairment and would continue to review applications for new or modified major stationary sources upwind of the park, pursuant to the Prevention of Significant Deterioration regulations.
- The NPS would comply with the EPA general conformity rule for any future actions that would occur within Mariposa and Madera counties, which are part of MCAB and SJVAB, respectively.

## All River Segments

### *Impacts of Actions to Protect and Enhance River Values*

Corridorwide actions to protect and enhance river values that would occur across Alternatives 2–6 involve restoration and protection of the channel itself, meadow and riparian habitats, and upland vegetation. These include restoration of six miles of informal trails, removal of abandoned underground infrastructure, improvement of river access points, management of large wood, and the removal of riprap, among other activities. Such actions would involve temporary emissions of air pollutants, which would likely include ozone precursors from equipment and motor vehicle exhaust, as well as fugitive dust from ground-disturbing activities and vehicular travel over paved and unpaved roads. Pollutant emissions would vary based on the intensity of construction (i.e., type and quantity of equipment, number of workers and trucks, area disturbed), time of day (due to inversions during the night and mixing during days), and duration of construction activities. Construction activities for each segment are assumed to be similar to those generally described herein, just with differing intensities. Compliance with the dust abatement and exhaust mitigation measures MM-AIR-1 and -2, which would reduce particulate emissions and NO<sub>x</sub> during construction (included in Appendix C), for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur across all segments under Alternatives 2-6 include removing 3,400 feet of riprap from the river bank and revegetating with riparian species, and replacing an additional 2,300 feet of riprap with bioengineered riverbank stabilization devices. This work would require the use of heavy equipment, including loaders and dump trucks. The removal, transport, disposal, restoration, and monitoring work associated with these actions would require several weeks of park staff time to implement, but would not substantially disrupt other ongoing construction, demolition, and restoration activities in the Valley and beyond. As a result, these actions would result in short-term regional and local, negligible to moderate, adverse impacts on air quality, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Short-term construction activities and impacts associated with parking and housing facilities would involve temporary emissions of air pollutants, which would likely include ozone precursors from equipment and motor vehicle exhaust, as well as fugitive dust from ground-disturbing activities and vehicular travel over paved and unpaved roads. Pollutant emissions would vary based on the intensity of construction (i.e., type and quantity of equipment, number of workers and trucks, area disturbed), time of day (due to inversions during the night and mixing during days), and duration of construction activities. Compliance with the dust abatement and exhaust mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Long-term Impacts of Actions to Manage User Capacities, Land Use, and Facilities would primarily be associated with on-road vehicles (visitors and employees) and local area pollution sources. Local

mobile sources would include automobiles, trucks, and buses and would remain subject to state and federal emissions control standards and programs, which are expected to lead to a continuing decrease in emissions per VMT for the foreseeable future, which would likely be regionally minor and beneficial. VOC and NO<sub>x</sub> are precursor compounds associated with ozone formation. However, in contrast to the ozone precursors, most of the particulate matter associated with vehicle use is related to entrainment of road dust rather than to exhaust, which would likely be local, negligible, and adverse.

In general, local area pollution sources would include regular maintenance activities, consumer products, natural gas combustion for heating/cooling, and campfires. Daily, routine, and intermittent operational maintenance intended to stabilize and protect park facilities, address visitor health and safety issues, and protect natural and cultural resources include campground maintenance, road and trail maintenance, building and grounds maintenance, and utility system repair and maintenance throughout Segments 1–8. Visitors and employees may use consumer products, such as hair spray, that emit VOC. Natural gas combustion may be used for water heaters or other facility systems, which emit ozone precursors and particulates. Campfires emit particulate matter and would continue to be subject to park regulations. Impacts of these local sources would likely be regional and local, negligible, and adverse.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values that would occur in Yosemite Valley under Alternatives 2-6 involve removal of abandoned infrastructure and other development affecting the Merced River's hydrologic function, extensive meadow restoration, and management of high visitor-use areas to address associated impacts on riparian habitats and sensitive cultural resources. Removal of abandoned or obsolete infrastructures would reduce ongoing impacts on meadow hydrology and lessen channel scour. Upland restoration activities, including removal of informal trails, roadbeds, and parking areas, would improve meadow health. The demolition, removal, transport, disposal, restoration would require the use of heavy equipment over a period of several weeks. As a result, these actions would result in short-term regional and local, negligible to minor, adverse impacts on air quality, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternatives 2-6 include: restoring 4.5 acres of riparian habitat in the area of Yosemite Lodge and 20 acres in the area of the Former Upper Pines Loop Campground; restoring impacted areas of Ahwahnee Meadow, including through removal of tennis courts; improving access and removing infrastructure from riparian areas at Cathedral Beach, Housekeeping Camp, and Bridalveil; constructing a boardwalk extension to reduce Sentinel Meadow trampling; fencing and vegetation management at Stoneman Meadow, restoring floodplain habitat at Devil's Elbow, removing one and paving and formalizing five other roadside pullouts along El Portal Road, and filling ditches not serving current operational needs. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, removal, transport, disposal, restoration, and monitoring work associated with these actions would

require more than one year of park staff time to implement. As a result, these actions would result in short-term regional and local, negligible to moderate, adverse impacts on air quality, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternatives 2-6 include: placing engineered logjams in the channel between Clarks and Sentinel Bridges; and removing the abandoned gauging station at Pohono Bridge, removing the footings and former river gauge base at Happy Isles, and restoring these areas to natural conditions. This work would involve the use of heavy equipment, including excavators, a skid steer, and dump trucks, and require approximately more than 17 weeks to implement. As a result, these actions would result in short-term regional and local, minor to moderate, adverse impacts on air quality, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

**Cultural Resource Actions.** Specific projects to protect and enhance the river's cultural values that would occur within Segment 2 under Alternatives 2-6 include rehabilitation of informal trails and parking in the vicinity rock art and rock shelters in the area of Bridalveil Falls, fencing and/or restricting access to the archeologically significant large bedrock mortar (pounding rock) next to Yosemite Falls Trail, restoration of impacted portions of Ahwahnee Meadow, and removal of abandoned infrastructure from the Bridalveil sewer plant to enhance oak recruitment. With the exception of abandoned infrastructure removal, the majority of this work would be completed through the use of hand tools. As such, the impact on air quality would be regional and local, short-term, negligible to minor, and adverse.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values that would occur within Segment 2 under Alternatives 2-6 include: selective thinning of conifers and other vegetation in the vicinities of The Ahwahnee and Meadow, Bridalveil Falls and West Valley, Cooks and Sentinel Meadows, Curry Village, El Capitan, Housekeeping Camp, Yosemite Lodge, and other areas of the Valley; restoring grassland and oak habitat in the areas of Bridalveil Straight; repairing riverbank erosion at Clark's Bridge; and addressing informal trails and trampling at the east end of El Capitan Meadow. Much of this work would be accomplished through the use of hand tools, but could also involve heavy equipment for various handling, transport, and restoration activities. This work would occur over the course of several years. As a result, these actions would result in short-term regional and local, negligible to moderate, adverse impacts on air quality.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions to manage visitor use and facilities within Segment 2 that would occur under Alternatives 2-6 involve substantial changes to campsites, visitor and administrative facilities, employee housing, and transportation. The construction, demolition, transport, and disposal activities associated with this work would contribute to a short-term, regional and local, moderate, adverse impact on air quality, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C). These actions would have a long-term, local, minor, beneficial impact on air quality within Segment 2, as vehicle traffic and visitation would be reduced as a result.



**Curry Village and Campgrounds.** The park would remove the Happy Isles Snack Stand at Curry Village. At The Ahwahnee, the park would remove the swimming pool and tennis courts; redesign, formalize, and improve drainage within the existing parking lot; and construct a new 50 parking space lot east of the current parking area. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of parking would provide access to the valley for a greater number of private vehicles, resulting in a local, long-term, negligible, adverse air quality impact.

**Camp 6 and Yosemite Village.** The park would remove from Yosemite Village the Concessioner General Office, Concessioner Garage, and the Arts and Activities Center (Bank Building), and repurpose the Village Sports Shop for public use. It would also construct a new maintenance building near the Government Utility Building. The park would remove roadside parking along Sentinel Drive and expand Camp 6 parking into the footprint of the Concessioner Garage. To improve visitor access between the Camp 6 area and Village, the park would construct a pathway connecting the new Camp 6 parking lot with the repurposed Village Sports Shop. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse.

**West Yosemite Valley.** The park would remove the NPS Volunteer Office, post office, swimming pool, and snack stand. It would also remove old and temporary employee housing (Thousands Cabins and Highland Court) and replace it with new housing. In addition, the park would relocate the Yosemite Lodge maintenance and housekeeping facilities and repurpose the food court. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in regional and local, short-term, adverse impacts on air quality, ranging from negligible to moderate. No long-term impacts would be expected. Actions to manage user capacities, land use, and facilities within Segment 2 would have regional and local, short-term, negligible adverse impacts. Over the long-term, the impacts of these actions would be local, long-term, minor, and beneficial.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

To protect and enhance river values within the Merced River gorge and El Portal, the park would remove informal trails, nonessential roads, fill materials, and abandoned infrastructure throughout Segments 3 and 4. The demolition, removal, transport, and disposal of waste materials; and restoration of these areas would have a short-term, regional and local, negligible to minor adverse impact on air quality within Segments 3 and 4.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 4 under Alternatives 2-6 include removing development, asphalt, and imported fill from the Abbieville and Trailer Village areas and recontouring and revegetating the 150-foot riparian buffer. The project would require the use of a skid steer and dump truck, and take

several weeks to complete. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic resource values include restoring the Greenemeyer Sand Pit to natural conditions. The work would require the use of heavy equipment over a period of several weeks. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values that would occur within Segment 3 under Alternatives 2-6 include: selective thinning of conifers in the area of the Cascade Falls viewpoint. Much of this work would be accomplished through the use of hand tools, but could also involve heavy equipment for various handling, transport, and restoration activities. This work would occur over the course of a few days and would not be expected to disrupt other restoration activities. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under each alternative, the park would construct infill housing in El Portal Village Center. The park would also construct a restroom for visitor use in Old El Portal. The work would require the use of heavy equipment throughout the construction process. As such, the projects would have a short-term, regional and local, negligible to minor, adverse impact on air quality within Segment 4. Over the long-term, occupation of the new residential units would contribute to a local, negligible, adverse impact on air quality within Segment 4.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would have a short-term, regional and local, negligible to minor adverse impact on air quality within Segments 3 and 4. These actions would not be expected to have a long-term air quality impact. Actions to manage user capacities, land use, and facilities within Segments 3 & 4 would have local, long-term, minor, adverse air quality impacts.

#### **Segments 6 and 7: Wawona and Wawona Impoundment**

##### *Impacts of Actions to Protect and Enhance River Values*

The park would improve Wawona Campground wastewater and refuse management and facilities, remove abandoned infrastructure, and undertake numerous site-specific management measures to counteract or minimize ongoing impacts on cultural resources. These actions would have a short-term, regional and local, negligible, adverse impact on air quality within Segment 7.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic values that would occur within Segment 7 under Alternatives 2-6 include developing a waste water collection system, including the construction of a pump station above the Wawona Campground. This work would require the use of heavy equipment, including an excavator, skid steer, loader, and

dump truck. This effort would require approximately one month of crew time to complete. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

**Cultural Resource Actions.** Specific projects to protect and enhance the river's cultural values that would occur within Segment 7 under Alternatives 2-6 include removing and relocating campsites that cause potential impacts to sensitive archeological resources. This work could require the use of heavy equipment, including an excavator, skid steer, loader, and dump truck. This effort would require approximately one week of staff time to complete. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality. Over the long-term, reduced campsites would result in reduced campfires, which would be a local, negligible, beneficial impact.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

To improve operational efficiency, the park would construct new facilities to house maintenance operations and a new wildland fire station within Segment 7. The park would also remove staged materials, abandoned utilities, vehicles, and a parking lot from the riparian buffer at the Wawona Maintenance Yard and restore the area's native ecosystem, and remove roadside parking between the Wawona Store and Chilnualna Falls Road. The construction and restoration activities associated with these projects would involve the use of heavy equipment and occur over a period of several months. The resulting impact on Segment 7 air quality would be regional and local, short-term, minor to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2.

**Wawona.** The park would redesign the bus stop at the Wawona Store to accommodate increased visitor use. This work would be completed largely with hand tools and some power tools. As a result, the air quality impact would be local, short-term, negligible, and adverse.

**Segment 7 Impact Summary:** Actions to protect and enhance river values within Segments 6 & 7 would have a local, negligible, beneficial air quality impact. Actions to manage user capacities, land use, and facilities would not be expected to have a long-term air quality impact.

### **Summary of Impacts Common to Alternatives 2–6**

Air quality in the Merced River corridor would continue to be influenced by local pollution sources within the park and by regional sources upwind of the park. The relative importance of local and regional sources would continue to vary by season and by pollutant. Furthermore, nonwilderness portions of the corridor would be affected by local emissions sources to a much greater extent than wilderness portions. Local stationary sources would continue to be regulated under the applicable air district rules and regulations, some local area sources would continue to be subject to park regulations, and mobile sources would continue to be subject to state and federal tailpipe emissions standards.

Many of the action items would involve varying degrees of short-term construction activities that would result in short-term, negligible to moderate (depending on action item construction phasing/activity overlap) impacts with regard to ozone precursors and particulate emissions from equipment and vehicular exhaust and fugitive dust. Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce these potential short-term, adverse impacts

associated with construction emissions to the extent feasible. Even after mitigation, regional and local short-term, negligible to moderate, adverse impacts from construction would be expected.

### ***Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 2 would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

With regard to regional, long-term impacts associated with the reduced visitor capacity under Alternative 2, on-road mobile emissions were quantified using the California Air Resources Board's emissions factors model (EMFAC2007) and compared to the Federal General Conformity thresholds. The results are shown in **table 9-134**, below. Although bus operations are projected to increase under Alternative 2, the reduction in total daily visitor and administrative use and capacity would result in a regional and local long-term, minor, beneficial impact owing to reduced on-road vehicles in the park, as depicted in the table. Regional and local impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, minor, and beneficial. Other local, long-term operational impacts of Alternative 2 are described below for each segment.

#### **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

##### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**TABLE 9-134: ON-ROAD VEHICLE CRITERIA AIR POLLUTANT EMISSIONS (tons/year)<sup>a</sup>**

Scenario	NO <sub>x</sub>	ROG
Alternative 2 Emissions	18	20
Alternative 1 (No Action) Emissions	22	26
Incremental Change <sup>b</sup>	(4)	(6)
Federal General Conformity Threshold <sup>c</sup>	100	50
Impact Intensity, Type? <sup>d</sup>	Minor, Beneficial	Minor, Beneficial
<sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in chapter 7 were totaled for each alternative to determine the regional air pollutant emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G. <sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions. <sup>c</sup> Federal General Conformity thresholds for the Mariposa County portion of the MCAB. <sup>d</sup> Negligible impacts would be effects considered not detectable and would have no discernible effect on air quality (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of the applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on local or regional air quality (assumed to occur when emissions exceed applicable threshold).		

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to the Merced Lake Backpackers Camp, Merced Lake High Sierra Camp, and Little Yosemite Valley would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Wilderness areas would be minimally affected by local emissions sources, with the exception of wildland and prescribed fires, or the occasional campfire from overnight visitors. Impacts from prescribed burning would continue to be controlled through implementation of smoke management policies in the *Fire Management Plan/EIS*. In addition, impacts from in-park emissions, such as vehicles, would be more apparent in areas close to roads and concentrations of visitor and administrative services. With fewer on-road vehicles in the vicinity under Alternative 2, the overall effect on local air pollution conditions would be long term, minor, and beneficial.

**Merced Lake High Sierra Camp.** The park would close the Merced Lake High Sierra Camp and remove all associated infrastructure, convert the area to designated Wilderness, and expand dispersed camping at Merced Lake Backpackers Camping Area into the former High Sierra Camp footprint. These actions would primarily involve the use of hand tools and a limited amount of power equipment. However, removal of these facilities would likely require several helicopter trips. As such, the impact on local air quality would be short-term, negligible, and adverse. The reduction in lodging

units would reduce total overnight visitation and energy required to run the facility, resulting in a local, long-term, negligible, beneficial air quality impact.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segments 1, 5, 6, and 8 would have long-term, minor, beneficial impacts on air quality within these segments.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 2 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing development, asphalt, and fill material, and restoring 35.6 acres of floodplain at the former Upper and Lower River campgrounds; removing campsites and infrastructure from the 100-year floodplain and restoring an additional 25.1 acres of floodplain and riparian habitat; and removing informal trails and informal parking at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require approximately 65 weeks of crew and equipment time over a period of three years. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 2 include: relocating unimproved Camp 6 parking and rerouting a portion of Northside Drive; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the

analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Overnight visitation and total daily use levels would be 26% and 33% less, respectively, than under Alternative 1. With fewer on-road vehicles under Alternative 3, the effect on local air pollution conditions would be long term, minor, and beneficial. However, the majority of campsites and their associated campfires and other sources of evening smoke are located within Segment 2. These sources of smoke would continue to affect local air quality at levels that may be unhealthy for sensitive groups, including individuals with pulmonary or cardiovascular diseases, the elderly, and children. Wood smoke can contribute enough local emissions currently to create unhealthy pollutant levels for sensitive groups, especially many wood burning sources operating under stable atmospheric conditions. Reduced campsites along this segment (estimated at 450 versus 466 for Alternative 1) would result in a proportional reduction in campfire emissions, which would be a local, long-term, minor beneficial impact. With fewer on-road vehicles and potential for wood smoke under Alternative 2, the overall effect on local air pollution conditions would be long term, minor, and beneficial.

**Curry Village and Campground.** The park would construct 78 new hard-sided units in Boys Town, bringing the total number of new and retained units at Curry Village to 433. The park would remove campsites from lower Pines (32), North Pines (86), and Upper Pines (24). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The reduction in overnight accommodations would reduce total overnight visitation and number of campfires, resulting in a local, long-term, minor, beneficial air quality impact.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing Camp 4 and Yosemite Lodge. The park would convert the Highland Court area to a walk-in campground; reconfigure pedestrian crossing of Northside Drive and Yosemite Lodge Drive, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of parking would provide access to the valley for a greater number of private and commercial vehicles, resulting in a local, long-term, minor, adverse air quality impact.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, short-term, adverse impacts ranging from negligible to moderate. These actions would not



be expected to have a long-term impact on air quality. Actions to manage user capacities, land use, and facilities within Segment 2 would have local, long-term, minor, beneficial impacts on air quality.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

There are no NPS overnight accommodations along Segments 3 and 4, and thus few campfires or other visitor-related evening sources of smoke. Also, as described in the Alternatives chapter, total daily use levels would be less than under Alternative 1. With fewer on-road vehicles under Alternative 1, the overall effect on local air pollution conditions would be long-term, minor, and beneficial.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would have a short-term, regional and local, negligible to minor adverse impact on air quality within Segments 3 and 4. These actions would not be expected to have a long-term air quality impact. Actions to manage user capacities, land use, and facilities within Segments 3 & 4 would have local, long-term, minor, beneficial air quality impacts.

### **Segment 7: Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 2 include the relocation of stock use campsites

from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week to implement. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to service facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Wawona Campground:** Under Alternative 2, the park would reduce the size of the Wawona Campground. Thirty-two campsites, or 33% of all campsites within Wawona, would be removed from the floodplain. There would be a proportional reduction in campfire emissions. This would result in a long-term, local, minor, beneficial impact on air quality.

**Segment 7 Impact Summary:** Actions to protect and enhance river values within Segments 6 & 7 would have regional and local, short-term, negligible to minor, adverse air quality impacts. Over the long-term, these actions would contribute to a local, negligible, beneficial impact. Actions to manage user capacities, land use, and facilities within Segment 7 would have local, long-term, minor, beneficial impacts on air quality.

### **Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Impacts associated with implementation of Alternative 2 would be similar to those described above for the analysis common to Alternatives 2–6. In summary, compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential short-term adverse impacts associated with construction emissions to the extent feasible. Even after mitigation, short-term, negligible to moderate, adverse impacts from construction would be anticipated. With regard to long-term operations, reduced housing, campsites, or lodging would result in a proportional reduction in area source emissions (e.g., from consumer products, maintenance/landscaping, natural gas combustion for heating/cooling) and campfire emissions. In addition, reducing the overall visitor capacity would result in a regional and local, long-term, minor, beneficial impact on the air quality environment by reducing pollutant emissions associated with on-road vehicles and campfires in Yosemite Valley. Regional and local, impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, minor, and beneficial.

### **Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following air quality analysis are the same as those identified for Alternative 1.

### ***Overall Cumulative Impact from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

Because management action under Alternative 2 and actions common to Alternatives 2-6 involve substantial construction activity, it would be expected to contribute to regional and local, short-term, adverse impacts on air quality resulting from construction activities.

Over the long term, with respect to ozone, conditions in the Merced River corridor would continue to be determined almost entirely by regional emissions trends instead of by local emissions sources. The regional, long-term impact would most likely be beneficial, owing to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. In addition, with reduced visitor capacity and campsites, Alternative 2 would result in a long-term, cumulatively beneficial impact on air quality from reduced VMT (ozone and particulate emissions) and campfire usage (particulate emissions). The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor, beneficial impacts on air quality.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 3 would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

With regard to regional, long-term impacts associated with the reduced visitor capacity under Alternative 3, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared to the Federal General Conformity thresholds. The results are shown in **table 9-135**, below. Although bus operations are projected to increase under Alternative 3, the reduction in total daily visitor and administrative use and capacity would result in a regional and local, long-term, minor, beneficial impact owing to reduced on-road vehicles in the park, as depicted in the table. Regional and local impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, minor, and beneficial.

**TABLE 9-135: ON-ROAD VEHICLE CRITERIA AIR POLLUTANT EMISSIONS (tons/year)<sup>a</sup>**

Scenario	NO <sub>x</sub>	ROG
Alternative 3 Emissions	17	19
Alternative 1 (No Action) Emissions	22	26
Incremental Change <sup>b</sup>	(5)	(7)
Federal General Conformity Threshold <sup>c</sup>	100	50
Impact Intensity, Type? <sup>d</sup>	Minor, Beneficial	Minor, Beneficial
<sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in chapter 7 were totaled for each alternative to determine the regional air pollutant emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G. <sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions. <sup>c</sup> Federal General Conformity thresholds for the Mariposa County portion of the MCAB. <sup>d</sup> Negligible impacts would be effects considered not detectable and would have no discernible effect on air quality (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on local or regional air quality (assumed to occur when emissions exceed applicable threshold).		

Other local, long-term, operational impacts of Alternative 3 are described below for each segment.

### **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Impacts from in-park emissions, such as vehicles, would be more apparent in areas close to roads and concentrations of visitor and administrative services. With fewer on-road vehicles in the vicinity under

Alternative 3, the overall effect on local air pollution conditions would be long term, minor, and beneficial.

Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and use the former camp area for a temporary stock camp. These actions would primarily involve the use of hand tools and a limited amount of power equipment. However, removal of these facilities would likely require several helicopter trips. As such, the impact on local air quality would be short-term, negligible, and adverse. The reduction in lodging units would reduce total overnight visitation and energy required to run the facility, resulting in a local, long-term, negligible, beneficial air quality impact.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segments 1, 5, 6, and 8 would have long-term, minor, beneficial impacts on air quality within these segments.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 3 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing development, asphalt, and fill material, and restoring 35.6 acres of floodplain at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 150 feet of the river and restoring an additional 12 acres of floodplain and riparian habitat; and removing informal trails and installing signage and fencing to redirect visitor traffic at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require approximately 50 weeks of crew and equipment time over a period of two years. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 3 include: relocating unimproved Camp 6 parking; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and

equipment time over a period of two years. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Overnight visitation and total daily use levels would be 23% and 37% less, respectively, than under Alternative 1. With fewer on-road vehicles under Alternative 3, the effect on local air pollution conditions would be long term, minor, and beneficial. However, the majority of campsites, and their associated campfires and other sources of evening smoke, are located within Segment 2. Campfires would continue to be subject to park regulations, and related emissions could increase in proportion to the increased campsites. Campfires or other evening sources of smoke would continue to affect local air quality at levels that may be unhealthy for sensitive groups, including individuals with pulmonary or cardiovascular diseases, the elderly, and children. Since wood smoke can contribute enough local emissions currently to create unhealthy pollutant levels for sensitive groups, especially many wood burning sources operating under stable atmospheric conditions, the expected increase in the usage of campfires under Alternative 3 would have a potentially local, long-term, moderate, adverse impact on sensitive receptors. Increased usage of campfires would also result in a potentially local, long-term, moderate, adverse impact if the usage results in increased PM10 measurements above the ambient air quality standard at the monitoring site at the Yosemite Valley Visitor Center.

**Curry Village and Campground.** The park would retain 355 guest units at Curry Village. The park would remove campsites from lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The reduction in overnight accommodations would reduce total overnight visitation and number of campfires, resulting in a local, long-term, minor, beneficial air quality impact.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing to west of the Northside Drive and Yosemite Lodge Drive, relocate the existing bus drop-off area to the Highland

Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of parking would provide access to the valley for a greater number of private and commercial vehicles, resulting in a local, long-term, minor, adverse air quality impact.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, short-term, adverse impacts ranging from negligible to moderate. These actions would not be expected to have a long-term impact on air quality. Actions to manage user capacities, land use, and facilities within Segment 2 would have local, long-term, minor, beneficial air quality impacts associated with vehicle emissions; but would also result in a local, long-term, moderate, adverse air quality impact from increased numbers of campfires.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to employee housing facilities would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

There are no NPS overnight accommodations along Segments 3 and 4, and thus few campfires or other visitor-related evening sources of smoke. Also, as described in the Alternatives chapter, total daily use levels would be less than under the Alternative 1. With fewer on-road vehicles under Alternative 3, the overall effect on local air pollution conditions would be long term, minor, and beneficial.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would have a short-term, regional and local, negligible to minor adverse impact on air quality within Segments 3 & 4. These actions would not be expected to have a long-term air quality impact. Actions to manage user capacities, land use, and facilities within Segments 3 & 4 would have local, long-term, minor, beneficial air quality impacts.



## Segment 7: Wawona

### *Impacts of Actions to Protect and Enhance River Values*

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week to complete. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Short-term construction activities and impacts associated with changes to service facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Wawona Campground.** Under Alternative 3, the park would reduce the size of the Wawona Campground. Twenty seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. There would be a proportional reduction in campfire emissions. This would result in a long-term, local, minor, beneficial impact on air quality.

**Segment 7 Impact Summary:** Actions to protect and enhance river values within Segments 6 & 7 would have regional and local, short-term, negligible to minor, adverse air quality impacts. Over the long-term, these actions would contribute to a local, negligible, beneficial impact. Actions to manage user capacities, land use, and facilities within Segment 7 would have local, long-term, minor, beneficial impacts on air quality.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Impacts associated with implementation of Alternative 3 would be similar to those described above for the analysis common to Alternatives 2–6. In summary, compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local, short-term, adverse impacts associated with construction emissions to the extent feasible. Even after mitigation, regional and local, short-term, negligible to moderate, adverse impacts from construction would be anticipated. With regard to long-term operations, increased campsites and associated campfires in Yosemite Valley could result in a local, moderate, adverse impact. Reduced housing or

lodging would result in a proportional reduction in area source emissions (e.g., from consumer products, maintenance/landscaping, natural gas combustion for heating/cooling). In addition, reducing the overall visitor capacity would result in a regional and local, long-term, minor, beneficial impact on air quality within the Merced River corridor by reducing pollutant emissions associated with on-road vehicles and campfires in Yosemite Valley. Regional and local, impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, minor, and beneficial.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following air quality analysis are the same as those identified for Alternative 1.

#### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

Because management action under Alternative 3 and actions common to Alternatives 2-6 involve substantial construction activity, it would be expected to contribute to short-term, adverse impacts on air quality resulting from construction activities.

Over the long term, with respect to ozone, conditions in the Merced River corridor would continue to be determined almost entirely by regional emissions trends instead of by local emissions sources. The regional, long-term impact would most likely be beneficial, owing to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. In addition, with reduced visitor capacity, Alternative 3 would result in a long-term, cumulatively beneficial impact on air quality from reduced VMT (ozone and particulate emissions). Regarding potential particulate emissions, since campsites would increase in Yosemite Valley, campfire usage (particulate emissions) would increase proportionately which would result in a local, long-term, moderate adverse impact. The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.

### ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 4 would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

With regard to regional, long-term impacts associated with the reduced visitor capacity under Alternative 4, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared to the Federal General Conformity thresholds. The results are shown in **table 9-136**, below. Although bus operations are projected to increase under Alternative 4, the reduction in total daily visitor and administrative use and capacity would result in a regional and local, long-term, minor, beneficial impact owing to reduced on-road vehicles in the park, as depicted in the table. Regional and local, impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, minor, and beneficial.

**TABLE 9-136: ON-ROAD VEHICLE CRITERIA AIR POLLUTANT EMISSIONS (tons/year)<sup>a</sup>**

Scenario	NO <sub>x</sub>	ROG
Alternative 4 Emissions	20	22
Alternative 1 (No Action) Emissions	22	26
Incremental Change <sup>b</sup>	(2)	(4)
Federal General Conformity Threshold <sup>c</sup>	100	50
Impact Intensity, Type? <sup>d</sup>	Minor, Beneficial	Minor, Beneficial
<sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in chapter 7 were totaled for each alternative to determine the regional air pollutant emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G. <sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions. <sup>c</sup> Federal General Conformity thresholds for the Mariposa County portion of the MCAB. <sup>d</sup> Negligible impacts would be effects considered not detectable and would have no discernible effect on air quality (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on local or regional air quality (assumed to occur when emissions exceed applicable threshold).		

Other local, long-term, operational impacts of Alternative 4 are described below for each segment.

## **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Impacts from in-park emissions, such as vehicles, would be more apparent in areas close to roads and concentrations of visitor and administrative services. With fewer on-road vehicles in the vicinity under Alternative 4, the overall effect on air pollution conditions would be local, long term, minor, and beneficial.

Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and restoration of the former camp area to natural conditions. These actions would primarily involve the use of hand tools and a limited amount of power equipment. However, removal of these facilities would likely require several helicopter trips. As such, the impact on local air quality would be short-term, negligible, and adverse. The reduction in lodging units would reduce total overnight visitation and energy required to operate the facility, resulting in a local, long-term, negligible, beneficial air quality impact.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segments 1, 5, 6, and 8 would have long-term, minor, beneficial impacts on air quality within these segments.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 4 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing asphalt and fill material, restoring topography of 19.7 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 150 feet of the river and restoring an additional 12 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 20 weeks of crew and equipment time over a period of at least two years. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 4 include: relocating unimproved Camp 6 parking; placing large wood and engineered logjams along the base of Stoneman Bridge; removing the Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time over a period of two years, during which other restoration and maintenance activities would be disrupted. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Overnight visitation and total daily use levels would be 7% greater and 19% less, respectively, than under Alternative 1. With fewer on-road vehicles under Alternative 4, the overall effect on local air pollution conditions along roadways would be long term, minor, and beneficial. However, the majority of campsites, and their associated campfires and other sources of evening smoke, are located within Segment 2. Campfires would continue to be subject to park regulations, and related emissions could increase in proportion to the increased campsites (701 sites versus 466 sites for Alternative 1). Campfires or other evening sources of smoke would continue to affect local air quality at levels that may be unhealthy for sensitive groups, including individuals with pulmonary or cardiovascular diseases, the elderly, and children. Since wood smoke can contribute enough local emissions currently to create unhealthy pollutant levels for sensitive groups, especially many wood-burning sources

operating under stable atmospheric conditions, the expected increase in the usage of campfires under Alternative 4 would have a potentially local, long-term, moderate, adverse impact on sensitive receivers. Increased usage of campfires would also result in a potentially local, long-term, moderate, adverse impact if the usage results in increased PM10 measurements above the ambient air quality standard at the monitoring site at the Yosemite Valley Visitor Center.

**Curry Village and Campground.** The park would retain 355 guest units and construct a new 40 site campground at Curry Village. The park would remove campsites from lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The reduction in overnight accommodations would reduce total overnight visitation and number of campfires, resulting in a local, long-term, minor, beneficial air quality impact.

**Camp 6 and Yosemite Village.** The park would improve the configuration of and on-grade pedestrian crossing at the Northside Drive-Yosemite Village Drive intersection, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 750 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of parking would provide access to the valley for a greater number of private and commercial vehicles, resulting in a local, long-term, minor, adverse air quality impact.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of parking would provide access to the valley for a greater number of private and commercial vehicles, resulting in a local, long-term, minor, adverse air quality impact.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, short-term, adverse impacts ranging from negligible to moderate. These actions would not be expected to have a long-term impact on air quality. Actions to manage user capacities, land use, and facilities within Segment 2 would have local, long-term, minor, beneficial air quality impacts associated with vehicle emissions; but a local, long-term, moderate, adverse air quality impact from increased numbers of campfires.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2

(included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to parking and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

There are no NPS overnight accommodations along Segments 3 and 4, and thus few campfires or other visitor-related evening sources of smoke. Also, as described in the alternatives chapter, total daily use levels would be less than under Alternative 1. With fewer on-road vehicles under Alternative 4, the overall effect on local air pollution conditions would be long term, minor, and beneficial.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would have a short-term, regional and local, negligible to minor adverse impact on air quality within Segments 3 & 4. These actions would not be expected to have a long-term air quality impact. Actions to manage user capacities, land use, and facilities within Segments 3 & 4 would have short-term, regional and local, negligible to minor, adverse impacts on air quality within Segment 4. Over the long-term, these actions would have minor, beneficial air quality impacts.

## **Segment 7: Wawona**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 4 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1



and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Wawona Campground.** Under Alternative 4, the park would reduce the size of the Wawona Campground. Twenty-seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. There would also be a proportional reduction in campfire emissions. This would result in a long-term, local, minor, beneficial impact on air quality.

**Segment 7 Impact Summary:** Actions to protect and enhance river values within Segments 6 & 7 would have regional and local, short-term, negligible to minor, adverse air quality impacts. Over the long-term, these actions would contribute to a local, negligible, beneficial impact. Actions to manage user capacities, land use, and facilities within Segment 7 would have local, long-term, minor, beneficial impacts on air quality.

#### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Impacts associated with implementation of Alternative 4 would be similar to those described above for the analysis common to Alternatives 2–6. In summary, compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential short-term adverse impacts associated with construction emissions to the extent feasible. Even after mitigation, regional and local, short-term, negligible to moderate, adverse impacts from construction would be anticipated. With regard to long-term operations, reduced housing or lodging would result in a proportional reduction in area source emissions (e.g., from consumer products, maintenance/landscaping, natural gas combustion for heating/cooling). In addition, reducing the overall visitor capacity would result in a regional and local, long-term, minor, beneficial impact on the air quality environment by reducing pollutant emissions associated with on-road vehicles. Regional and local, impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, minor, and beneficial. A greater number of potential campfires associated with increased campsites in Yosemite Valley, however, would result in a potentially local, long-term, moderate, adverse impact owing to particulate emissions.

#### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following air quality analysis are the same as those identified for Alternative 1.

#### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

Because management action under Alternative 4 and actions common to Alternatives 2–6 involve substantial construction activity, it would be expected to contribute to regional and local, short-term, negligible to moderate, adverse impacts on air quality resulting from construction activities.

Over the long term, with respect to ozone, conditions in the Merced River corridor would continue to be determined almost entirely by regional emissions trends instead of by local emissions sources. The regional, long-term impact would most likely be beneficial, owing to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. In addition, with reduced overall visitor capacity, Alternative 4 would result in a regional and local, long-term, minor cumulatively beneficial impact on air quality from reduced VMT (ozone and particulate emissions). However, increased campsites could result in a local, moderate, adverse impact from increased campfire usage (particulate emissions). The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 5 would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

With regard to regional, long-term impacts associated with the reduced visitor capacity under Alternative 5, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared to the Federal General Conformity thresholds. The results are shown in **table 9-137**, below. As depicted in the table, the reduction in total daily visitor and administrative use and capacity would result in a regional and local, long-term, minor, beneficial impact for ROG emissions owing to reduced on-road vehicles in the park. However, with the increased bus operations under Alternative 5, NO<sub>x</sub> emissions would be a regional and local, long-term, negligible adverse impact. Regional impacts to AQRVs (such as pine injury from ozone and visibility) would be similar to existing conditions, but the local impact to lichen along roadways would be long-term, negligible, and adverse due to increased nitrogen deposition.

Other local, long-term, operational impacts of Alternative 5 are described below for each segment.

**TABLE 9-137: ON-ROAD VEHICLE CRITERIA AIR POLLUTANT EMISSIONS (tons/year)<sup>a</sup>**

Scenario	NO <sub>x</sub>	ROG
Alternative 5 Emissions	23	25
Alternative 1 (No Action) Emissions	22	26
Incremental Change <sup>b</sup>	1	(1)
Federal General Conformity Threshold <sup>c</sup>	100	50
Impact Intensity, Type? <sup>d</sup>	Negligible, Adverse	Minor, Beneficial
<p><sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in chapter 7 were totaled for each alternative to determine the regional air pollutant emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G.</p> <p><sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions.</p> <p><sup>c</sup> Federal General Conformity thresholds for the Mariposa County portion of the MCAB.</p> <p><sup>d</sup> Negligible impacts would be effects considered not detectable and would have no discernible effect on air quality (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on local or regional air quality (assumed to occur when emissions exceed applicable threshold).</p>		

### **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping facilities would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Impacts from in-park emissions, such as vehicles, would be more apparent in areas close to roads and concentrations of visitor and administrative services. With fewer on-road vehicles in the vicinity under Alternative 5, the overall effect on air pollution conditions would be long term, minor, and beneficial.

**Merced Lake High Sierra Camp.** The park would reduce the capacity of the Merced Lake High Sierra Camp to 42 beds and replace the flush toilets with composting toilets. These actions would primarily involve the use of hand tools and a limited amount of power equipment. However, removal of these facilities could require one or more helicopter trips. As such, the impact on local air quality would be short-term, negligible, and adverse. The reduction in lodging units would reduce total overnight visitation and energy required to run the facility, resulting in a local, long-term, negligible, beneficial air quality impact.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segments 1, 5, 6, and 8 would have long-term, minor, beneficial impacts on air quality within these segments.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternatives 5 include: removing asphalt and fill material, restoring topography of 35.6 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 100 feet of the river and restoring an additional 6.5 acres of floodplain and riparian habitat; removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; reconfiguring the Curry Orchard parking lot; removing informal trails and erecting fencing, signage, and boardwalks to redirect visitor traffic, and selectively removing conifers to improve views at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 40 weeks of crew and equipment time over a period of two years. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 5 include: relocating unimproved Camp 6 parking; removing the Sugar Pine Bridge; placing large wood and engineered logjams along the base of Stoneman Bridge; and improving trail connectivity and routing in the vicinity of the Ahwahnee Bridge. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require at least 16 weeks of crew and equipment time over a period of two years, during which other restoration and maintenance activities could be disrupted. The

resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, visitor services, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Overnight visitation and total daily use levels would be 16% greater and 5% less, respectively, than under Alternative 1. With fewer on-road vehicles and potential for wood smoke under Alternative 5, the overall effect on local air pollution conditions would be long term, minor, and beneficial. However, the majority of campsites, and their associated campfires and other sources of evening smoke, are located within Segment 2. Campfires would continue to be subject to park regulations, and related emissions could increase in proportion to the increased campsites (640 sites versus 466 sites for Alternative 1). Campfires or other evening sources of smoke would continue to affect local air quality at levels that may be unhealthy for sensitive groups, including individuals with pulmonary or cardiovascular diseases, the elderly, and children. Since wood smoke can contribute enough local emissions currently to create unhealthy pollutant levels for sensitive groups, especially many wood-burning sources operating under stable atmospheric conditions, the expected increase in the usage of campfires under Alternative 5 would have a potentially local, long-term, moderate, adverse impact on sensitive receivers. Increased usage of campfires would also result in a potentially local, long-term, moderate, adverse impact if the usage results in increased PM10 measurements above the ambient air quality standard at the monitoring site at the Yosemite Valley Visitor Center.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of overnight accommodations would increase total overnight visitation and related vehicle emissions, while the reduction in campsites would decrease the number of valley campfires and associated emissions. The resulting air quality impact would be local, long-term, negligible, and adverse.

**Camp 6 and Yosemite Village.** The park would construct a pedestrian underpass and a traffic circle at the intersection of Northside and Yosemite Village Drives, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The traffic circle and underpass would reduce emissions through

reducing intersection delays. However, addition of parking would provide access to the valley for a greater number of private vehicles. The net air quality effect would be local, long-term, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of parking would provide access to the valley for a greater number of private and commercial vehicles, resulting in a local, long-term, minor, adverse air quality impact.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, short-term, adverse impacts ranging from negligible to moderate. These actions would not be expected to have a long-term impact on air quality. Actions to manage user capacities, land use, and facilities within Segment 2 would have local, long-term, minor, beneficial air quality impacts associated with vehicle emissions; but a local, long-term, moderate, adverse air quality impact from increased numbers of campfires.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to parking and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

There are no NPS overnight accommodations along Segments 3 and 4, and thus few campfires or other visitor-related evening sources of smoke. Also, as described in the alternatives chapter, total daily use levels would be less than under Alternative 1. With fewer on-road vehicles under Alternative 5, the overall effect on local air pollution conditions would be long term, minor, and beneficial.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would have a short-term, regional and local, negligible to minor adverse impact on air quality within Segments 3 & 4.

These actions would not be expected to have a long-term air quality impact. Actions to manage user capacities, land use, and facilities within Segments 3 & 4 would have short-term, regional and local, negligible to minor, adverse impacts on air quality within Segment 4. Over the long-term, these actions would have minor, beneficial air quality impacts.

## **Segment 7: Wawona**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to the Wawona Maintenance Yard. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Wawona Campground.** Under Alternative 5, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. There would also be a proportional reduction in campfire emissions. This would result in a long-term, local, minor, beneficial impact on air quality.

**Segment 7 Impact Summary:** Actions to protect and enhance river values within Segments 6 & 7 would have regional and local, short-term, negligible to minor, adverse air quality impacts. Over the long-term, these actions would contribute to a local, negligible, beneficial impact. Actions to manage user capacities, land use, and facilities within Segment 7 would have local, long-term, minor, beneficial impacts on air quality.



## **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Impacts associated with implementation of Alternative 5 would be similar to those described above for the analysis common to Alternatives 2–6. In summary, compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential short-term, adverse impacts associated with construction emissions to the extent feasible. Even after mitigation, short-term, negligible to moderate, adverse impacts from construction would be anticipated. With regard to long-term operations, reduced housing or lodging would result in a proportional reduction in area source emissions (e.g., from consumer products, maintenance/landscaping, natural gas combustion for heating/cooling). In addition, the reduction in total daily visitor and administrative use and capacity and would result in a regional and local, long-term, minor, beneficial impact for ROG emissions owing to reduced on-road vehicles in the park. However, with the increased bus operations under Alternative 5, NO<sub>x</sub> emissions would be a regional and local, long-term, negligible adverse impact. Regional impacts to AQRVs (such as pine injury from ozone and visibility) would be similar to existing conditions, but the local impact to lichen along roadways would be long-term, negligible, and adverse due to increased nitrogen deposition. A greater number of potential campfires associated with increased campsites in Yosemite Valley, however, would result in a potentially local, long-term, moderate, adverse impact owing to particulate emissions.

## **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following air quality analysis are the same as those identified for Alternative 1.

### ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

Because management action under Alternative 5 and actions common to Alternatives 2–6 involve substantial construction activity, it would be expected to contribute to regional and local, short-term, negligible to moderate, adverse impacts on air quality resulting from construction activities.

Over the long term, with respect to ozone, conditions in the Merced River corridor would continue to be determined almost entirely by regional emissions trends instead of by local emissions sources. The regional, long-term impact would most likely be beneficial, owing to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. In addition, with reduced overall visitor capacity, would result in a regional and local, long-term, minor, beneficial impact for ROG emissions. However, with the increased bus operations under Alternative 5, NO<sub>x</sub> emissions would be a regional and local, long-term, negligible adverse impact. Increased campsites could result in a local moderate, adverse impact from increased campfire usage (particulate emissions). The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.

## ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 6 would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

With regard to regional, long-term impacts associated with the slightly increased visitor capacity under Alternative 6, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared to the Federal General Conformity thresholds. The results are shown in **table 9-138**, below. As depicted in the table, the increase in total daily visitor and administrative use and capacity and bus operations would result in a regional and local, long-term, negligible to minor, adverse impact owing to increased on-road vehicles in the park. Regional and local, impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, negligible to minor, and adverse.

Other local, long-term, operational impacts of Alternative 6 are described below for each segment.

### **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**TABLE 9-138: ON-ROAD VEHICLE CRITERIA AIR POLLUTANT EMISSIONS (tons/year)<sup>a</sup>**

Scenario	NO <sub>x</sub>	ROG
Alternative 6 Emissions	25	26
Alternative 1 (No Action) Emissions	22	26
Incremental Change <sup>b</sup>	3	0
Federal General Conformity Threshold <sup>c</sup>	100	50
Impact Intensity, Type? <sup>d</sup>	Minor, Adverse	Negligible, Adverse
<sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in chapter 7 were totaled for each alternative to determine the regional air pollutant emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G. <sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions. <sup>c</sup> Federal General Conformity thresholds for the Mariposa County portion of the MCAB. <sup>d</sup> Negligible impacts would be effects considered not detectable and would have no discernible effect on air quality (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on local or regional air quality (assumed to occur when emissions exceed applicable threshold).		

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping facilities would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Impacts from in-park emissions, such as vehicles, would be more apparent in areas close to roads and concentrations of visitor and administrative services. With more vehicles on park roads and in the vicinity of wilderness under Alternative 6, the overall effect on local, air pollution conditions would be long term, negligible, and adverse.

**Merced Lake High Sierra Camp.** The park would retain the Merced Lake High Sierra Camp and replace the flush toilets with composting toilets. These actions would primarily involve the use of hand tools and a limited amount of power equipment. However, removal of these facilities would likely require one or more helicopter trips. As such, the impact on local air quality would be short-term, negligible, and adverse.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segments 1, 5, 6, and 8 would have long-term, negligible, adverse impacts on air quality within these segments.

## Segment 2: Yosemite Valley

### *Impacts of Actions to Protect and Enhance River Values*

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 6 include: removing asphalt and fill material, restoring topography of 19.7 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 100 feet of the river and restoring an additional 6.5 acres of floodplain and riparian habitat; removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; and removing informal trails, installing viewing platforms and boardwalks, and selectively removing conifers to improve views at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 40 weeks of crew and equipment time over a period of at least two years. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 6 include: relocating unimproved Camp 6 parking and placing large wood and engineered logjams along the bases of Stoneman, Sugar Pine, and Ahwahnee Bridges. Under this alternative, Sugar Pine Bridge would be retained, engineered log jams and large wood installed at its base, and its condition monitored. Should long-term monitoring reveal mitigation measures are not sufficient, the park may undertake more aggressive management action, including removal of the bridge. Such action would require the use of heavy equipment and explosives to drop the bridge and dismantle the abutments. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 16 weeks of crew and equipment time over a period of two years. The resulting impact on regional and local air quality would be short-term, negligible to moderate, and adverse, even after implementation of mitigation measures MM-AIR-1 and -2 (included in Appendix C).

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

Overnight visitation and total daily use levels would be 33% and 4% greater, respectively, than under Alternative 1. With more on-road vehicles under Alternative 6, the overall effect on local air pollution conditions along roadways would be long term, minor, and adverse. In addition, the majority of campsites, and their associated campfires and other sources of evening smoke, are located within Segment 2. Campfires would continue to be subject to park regulations, and related emissions could increase in proportion to the increased campsites (739 sites versus 466 sites for Alternative 1). Campfires or other evening sources of smoke would continue to affect local air quality at levels that may be unhealthy for sensitive groups, including individuals with pulmonary or cardiovascular diseases, the elderly, and children. Since wood smoke can contribute enough local emissions currently to create unhealthy pollutant levels for sensitive groups, especially many wood burning sources operating under stable atmospheric conditions, the expected increase in the usage of campfires under Alternative 6 would have a potentially local, long-term, moderate, adverse impact on sensitive receptors. Increased usage of campfires would also result in a potentially local long-term, major, adverse impact if the usage results in increased PM10 measurements above the ambient air quality standard at the monitoring site at the Yosemite Valley Visitor Center.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of overnight accommodations would increase total overnight visitation and related vehicle emissions, while the reduction in campsites would decrease the number of valley campfires and associated emissions. The resulting air quality impact would be local, long-term, negligible, and adverse.

**Camp 6 and Yosemite Village.** The park would expand the Concessioner Warehouse Building to accommodate Concessioner General Office functions, construct a pedestrian underpass and two roundabouts, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The roundabout and underpass would reduce emissions through reducing intersection delays. However, addition of parking would provide access to the valley for a greater number of private vehicles. The net air quality effect would be local, long-term, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. These actions would require the use of heavy equipment and demolition activities. As such, the impact on local air quality would be short-term, minor, and adverse. The addition of parking would provide access to the valley for a greater number of private and commercial vehicles, resulting in a local, long-term, minor, adverse air quality impact.

**Segment 2 Impact Summary:** Actions to protect and enhance river values within Segment 2 would have local, short-term, adverse impacts ranging from negligible to moderate. These actions would not be expected to have a long-term impact on air quality. Actions to manage user capacities, land use, and facilities within Segment 2 would have local, long-term, negligible to minor, adverse air quality impacts associated with vehicle emissions; but a local, long-term, moderate, adverse air quality impact from increased numbers of campfires.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to parking and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

There are no NPS overnight accommodations along Segments 3 and 4, and thus few campfires or other visitor-related evening sources of smoke. Also, as described in the alternatives chapter, total daily use levels would be greater than under Alternative 1. With more on-road vehicles under Alternative 6, the overall effect on local air pollution conditions would be regional and local, long term, negligible, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would have a short-term, regional and local, negligible to minor adverse impact on air quality within Segments 3 & 4. These actions would not be expected to have a long-term air quality impact. Actions to manage user capacities, land use, and facilities within Segments 3 & 4 would have short-term, regional and local, negligible to minor, adverse impacts on air quality within Segment 4. Over the long-term, these actions would have minor, beneficial air quality impacts.

### **Segment 7: Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2-6 (see discussion of Impacts of Actions to Protect and Enhance

River Values under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 6 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. Accordingly, this action would result in short-term regional and local, negligible, adverse impacts on air quality.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6 (see discussion of Impacts of Actions to Manage User Capacities, Land Use, and Facilities under All River Segments). Compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential regional and local short-term, negligible to moderate impacts associated with construction emissions to the extent feasible.

As described in the alternatives chapter, total daily use levels would not change and maximum overnight capacity would be 5% less than under Alternative 1. Since campsites would be reduced along this segment (estimated at 83 and one group site versus 96 and one group site for Alternative 1), there would also be a proportional reduction in campfire emissions, which would be a local, long-term, minor, beneficial impact.

**Wawona Campground.** Under Alternative 6, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. This would result in a long-term, local, minor, beneficial impact on air quality.

**Segment 7 Impact Summary:** Actions to protect and enhance river values within Segments 6 & 7 would have regional and local, short-term, negligible to minor, adverse air quality impacts. Over the long-term, these actions would contribute to a local, negligible, beneficial impact. Actions to manage user capacities, land use, and facilities within Segment 7 would have local, long-term, minor, beneficial impacts on air quality.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Impacts associated with implementation of Alternative 6 would be similar to those described above for the analysis common to Alternatives 2–6. In summary, compliance with mitigation measures MM-AIR-1 and -2 (included in Appendix C) for applicable actions would reduce potential short-term adverse impacts associated with construction emissions to the extent feasible. Even after mitigation, regional and local, short-term, negligible to moderate, adverse impacts from construction would be anticipated. With regard to long-term operations, increased housing, campsites, or lodging would result in a proportional increase in area source emissions (e.g., from consumer products, maintenance/landscaping, natural gas combustion for heating/cooling) and campfire emissions. In addition, increasing the overall visitor capacity would result in a regional and local, long-term, negligible to minor, adverse impact on the air



quality environment associated with on-road vehicles. Regional and local, impacts to AQRVs (such as pine injury from ozone, visibility, and lichen sensitivity to nitrogen deposition) would also be long-term, negligible to minor, and adverse. A greater number of potential campfires associated with increased overnight accommodations in Yosemite Valley would result in a potentially local, long-term, moderate, adverse impact owing to particulate emissions.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following air quality analysis are the same as those identified for Alternative 1.

#### ***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

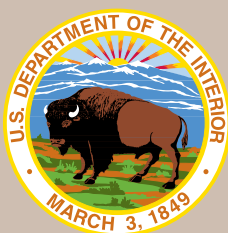
Because management action under Alternative 6 and actions common to Alternatives 2-6 involve substantial construction activity, it would be expected to contribute to regional and local, short-term, negligible to moderate adverse impacts on air quality resulting from construction activities.

Over the long term, with respect to ozone, conditions in the Merced River corridor would continue to be determined almost entirely by regional emissions trends instead of by local emissions sources. The regional, long-term impact would most likely be beneficial, owing to the emissions reductions expected to occur with implementation of ongoing state and federal mobile-source control programs. However, with increased overall visitor capacity, Alternative 6 would result in a regional and local, long-term, negligible to minor cumulatively adverse impact on air quality from increased VMT (ozone and particulate emissions) and increased campfire usage (particulate emissions). The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.

Merced Wild and Scenic River  
Draft Comprehensive Management Plan  
and Environmental Impact Statement

Yosemite National Park  
P.O. Box 577  
Yosemite, CA 95389

[www.nps.gov/yose/parkmgmt/mrp.htm](http://www.nps.gov/yose/parkmgmt/mrp.htm)



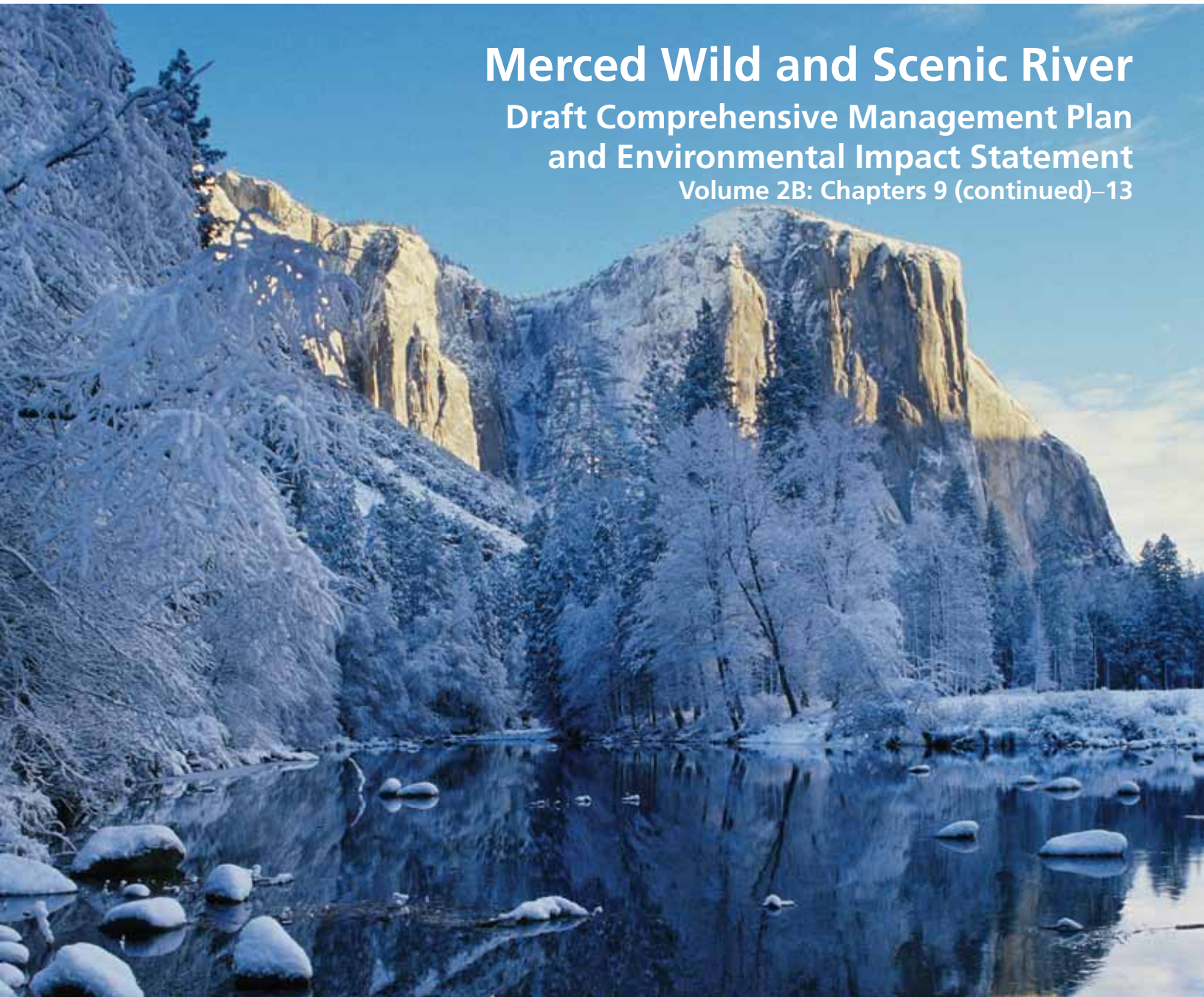
As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



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## Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement Volume 2B: Chapters 9 (continued)–13





**Yosemite National Park**

National Park Service  
U.S. Department of the Interior



# **Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement**

**Volume 2B: Chapters 9 (continued) - 13**

**January 2013**

# MERCED WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN / DEIS

## Volume 2: Chapters 9-13 and Appendices

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### Scenic Resources

#### *Affected Environment*

#### Regulatory Framework

Scenic views from nearly all lands in the Merced River corridor are distinct. Scenic quality is a core value embedded in the National Park Service (NPS) Organic Act of 1916:

*“Federal areas known as national parks . . . which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”*  
(NPS Organic Act, 16 USC 1)

The Yosemite Land Grant of 1864 legislation granted the Yosemite Valley and the Mariposa Grove of Big Trees from the federal government to the State of California “upon the express conditions that the premises shall be held for public use, resort, and recreation; inalienable for all time.” This was the first time land in the United States was preserved for its scenic values and for public benefit.

The visual landscape factored prominently in the decision to designate Yosemite as a national park and is one of the primary resources that the NPS is charged with protecting. As such, the NPS has taken the approach of analyzing potential impacts on visual resources by considering these inherent resources to be self-evidently valuable, and that the crux of any analysis should focus on how visitors to the park experience these resources. Following this principle, the NPS established policies and regulations, as described above, to protect visual resources, including efforts to characterize and catalog important scenic landscapes. The NPS has further developed these policies by identifying important scenic resources and establishing a framework for protecting them, including restrictions on development of human-made structures in visually important areas. Today, although structures and infrastructure intrude into some scenic views from the main stem Merced River and South Fork Merced River, or views to the river (such as the roads near the river in Yosemite Valley), the area is largely pristine and human-made features do not dominate, even in the landscapes where they are visible.

The 1980 *Yosemite General Management Plan* specifies the following management objectives to preserve, protect, and restore scenic resources:

- Identify the major scenic resources and the places from which they are viewed.
- Provide for the preservation or protection of existing scenic resource and viewing stations.
- Provide for historic views through vista clearing.
- Permit only those levels and types of use that are compatible with the preservation or protection of the scenic resources and with the quality of the viewing experience.

Tiered from the *Yosemite General Management Plan*, the final *Scenic Vista Management Plan for Yosemite National Park (Scenic Vista Management Plan)* (NPS 2011d) provides a systematic program for documenting, protecting, and reestablishing important viewpoints and vistas outside of designated Wilderness, consistent with the natural processes and human influence that created them.

The 2005 *A Sense of Place, Design Guidelines for Yosemite Valley* provide a framework for describing appropriateness of architectural and landscape character of new buildings, site work, and alterations. In general, the goals of the Design Guidelines include:

- Retention of natural site character, including setting, materials, and ecological processes.
- Design new buildings and facilities to blend with the natural environment, emphasizing non-intrusive design. They are sensitive to the environmental capacity of the site to absorb modifications. Facilities fit in with their sites rather than dominate them. Buildings are subordinate to the environment.
- Compatibility of structures and facilities with the cultural context and character in which they are located and protection of cultural integrity.
- Coordination and integration of the design of individual structures with those of the site plan as a whole.
- Enhancement of unifying architectural and landscape themes and elements within defined areas throughout Yosemite Valley.
- Emphasis on simplicity and restraint in design and respect for past building character, traditions, and practices.
- Recognition of the principles of rustic design used by previous designers, identification of those who retain validity today, and contemporary interpretation of those principles.

The detailed guidelines sections of *A Sense of Place* provide direction as to which design strategies and themes may be suitable for particular areas, including: Yosemite Village; Curry Village; the Ahwahnee; Yosemite Lodge; campground, Camp 4, and Housekeeping Camp; and day-use areas, the Indian Cultural Center, LeConte Memorial Lodge, Happy Isles, and shuttle bus stops.

## Regional Scenic Context

The scenery of Yosemite is one of its most significant resources and is largely responsible for the high visitation of the park by people from around the world. The 2009 summer visitor study indicated that the most common visitor activity was viewing scenery (93%) and the primary activity for 41% of visitor groups was also viewing scenery (Blotkamp et al. 2010). The 2008 winter visitor study indicated that for 67% of visitors, interest in seeing Yosemite scenery in wintertime was the most common factor affecting their decision to visit the park. The most common visitor activities were viewing scenery/taking a scenic drive (84%), taking photographs/painting/drawing (73%), and day hiking (35%) (Le et al. 2008).

As described in the “American Indian Traditional Cultural Resources” subsection later in this chapter, American Indian tribes and groups assign strong spiritual value to the Merced River and Yosemite Valley, attaching names and stories to geologic and other features in the river corridor. Since the first

explorations and descriptions of the Valley by Euro-Americans in the mid-19th century, views of the pastoral Valley juxtaposed with towering geologic features and dramatic waterfalls have been recognized as outstanding resources of Yosemite Valley. Indeed, the beauty of the Yosemite landscape came to the attention of the nation largely through the early writings, paintings, and photographs produced by nationally recognized artists and visitors to the region, whose inspiration in many ways influenced the U.S. Congressional legislation, leading to the designation of Yosemite as a place worthy of preservation. The scenic resources of Yosemite have a high degree of cultural significance. Most of the quintessential views into and from the Valley are iconic and are reflected in the works of artists including Albert Bierstadt, Ansel Adams, Thomas Moran, and Myron Hunt. The entire park, including the Wilderness and other areas outside Yosemite Valley, remains a favorite subject for professional and amateur artists, photographers, and writers, whose work continues to communicate to visitors and nonvisitors alike the unique scenic resource values of the park.

Scenic views from nearly all lands in the Merced River corridor include steep valleys and canyon walls, clear air, spectacular rock formations, and panoramic views, which combine to offer a wealth of visual resources nearly unsurpassed in the United States. As people move through the varied topography and vegetation along sections of the valleys and canyons that frame the Merced River, they experience a varied sequence of visual resources that provide a cumulative visual experience that is unique and above and beyond that of enjoying any one single viewpoint. This experience involves the interaction of multiple elements in relation to each other: the juxtaposition of individual features with the foreground and background, the interface of different surfaces, and the interplay of light reflecting off the different colors and textures of the elements making up the visual landscape.

Wildfire suppression practices initiated in the early 1900s have changed vegetation patterns from open, park-like vistas to more dense vegetation that have restricted views. In addition, historic wildfire suppression practices have resulted in catastrophic fires that affect scenic views. Vegetation changes that have affected scenic viewpoints are discussed further below, by segment.

### ***Segment 1: Merced River Above Nevada Fall***

Visual resources along this segment are less studied than those in Yosemite Valley and other developed areas, but exhibit equivalent scenic resource value. The scenery of this wilderness segment of the river is characterized by dramatic, glacially carved canyons; montane lakes framed by steeply sloping and sparsely vegetated granite rock faces; and meandering creeks flowing through broad pristine meadows. Scenic landmarks visible from the river and its band, and that contribute to this segment's scenic outstandingly remarkable value (ORV), include Washburn and Merced Lakes (see Photo SCN-1), Echo Valley, Bunnell Point, and Little Yosemite Valley, and many other named and unnamed scenic landmarks.

This long river segment of great visual variety, with its largely uncompromised natural setting, provides diverse, exceptional scenery, all with the river in the foreground. Human-made features in this segment are relatively few. Moreover, the comparatively low visitor use in Segment 1 enhances its scenic quality. Noteworthy human-made features visible in the river corridor are generally limited to the Merced Lake High Sierra Camp (see Photos SCN-2 and SCN-3) and the composting toilet at Little

Yosemite Valley Campground. The Little Yosemite and Merced Lake Ranger Stations are also visible from the river corridor.

Other factors that may influence the area's aesthetic character include regional air pollution (e.g., haze), which can limit visibility during the summer (NPS and Colorado State University 2002); and crowding near the backcountry designated camping areas as viewed in the foreground of scenic views or views of the river, which operate near capacity all summer. Despite the presence of existing structures, views from the river and trails along Segment 1 continue to have high aesthetic value.



**Photo SCN-1:** Merced Lake – 2010 (Yochim 2010)



**Photo SCN-2:** Merced Lake High Sierra Camp – 2010 (Yochim 2010)





**Photo SCN-3:** Merced Lake High Sierra Camp – 2010 (Yochim 2010)

### *Segment 2: Yosemite Valley*

The Merced River enters Yosemite Valley at Nevada Fall, flows through Emerald Pool, then over Vernal Fall and through Happy Isles. Once in the flat Valley, the Merced River provides the foreground to many of Yosemite’s most famous landmarks. From the river and its banks, views consist of Yosemite Falls, Bridalveil Fall, El Capitan, Half Dome, and other named and unnamed parts of the cliffs and hanging valleys rimming the Valley (see Photos SCN-4 and SCN-5). Meandering through a sequence of compound oxbows, wetlands, and meadows, the river and its related features provide broadened panoramas. Throughout the Valley, views from the river and its banks encompass the lower montane forest as it rises up to sheer rock faces of granite cliffs and talus slopes, with a flat valley bottom serving as a contrasting foreground. The juxtaposition of granite domes and waterfalls is unique, as is the concentration of river-related views found in the Valley.

During development of the *Yosemite General Management Plan* in the late 1970s, the NPS conducted an analysis of existing and historic viewing conditions in Yosemite Valley and identified the landscape features most visitors look for and are able to distinguish (NPS 1980). The study found the 11 most important features in the Valley to be Half Dome, Yosemite Falls, El Capitan, Bridalveil Fall, Three Brothers, Cathedral Rocks and Spires, Sentinel Rock, Glacier Point, North Dome, Washington Column, and Royal Arches. The study also evaluated all points from which these features could be seen (assuming no vegetation or structures obstructed the view) to establish the scenic viewing potential of different locations on the Valley floor. Existing viewpoints were identified, and the quality of their views and their proximity to roads and trails were noted. All of the identified “most important features” included in the *Yosemite General Management Plan* analysis are visible from various sections of the Merced River through Yosemite Valley.



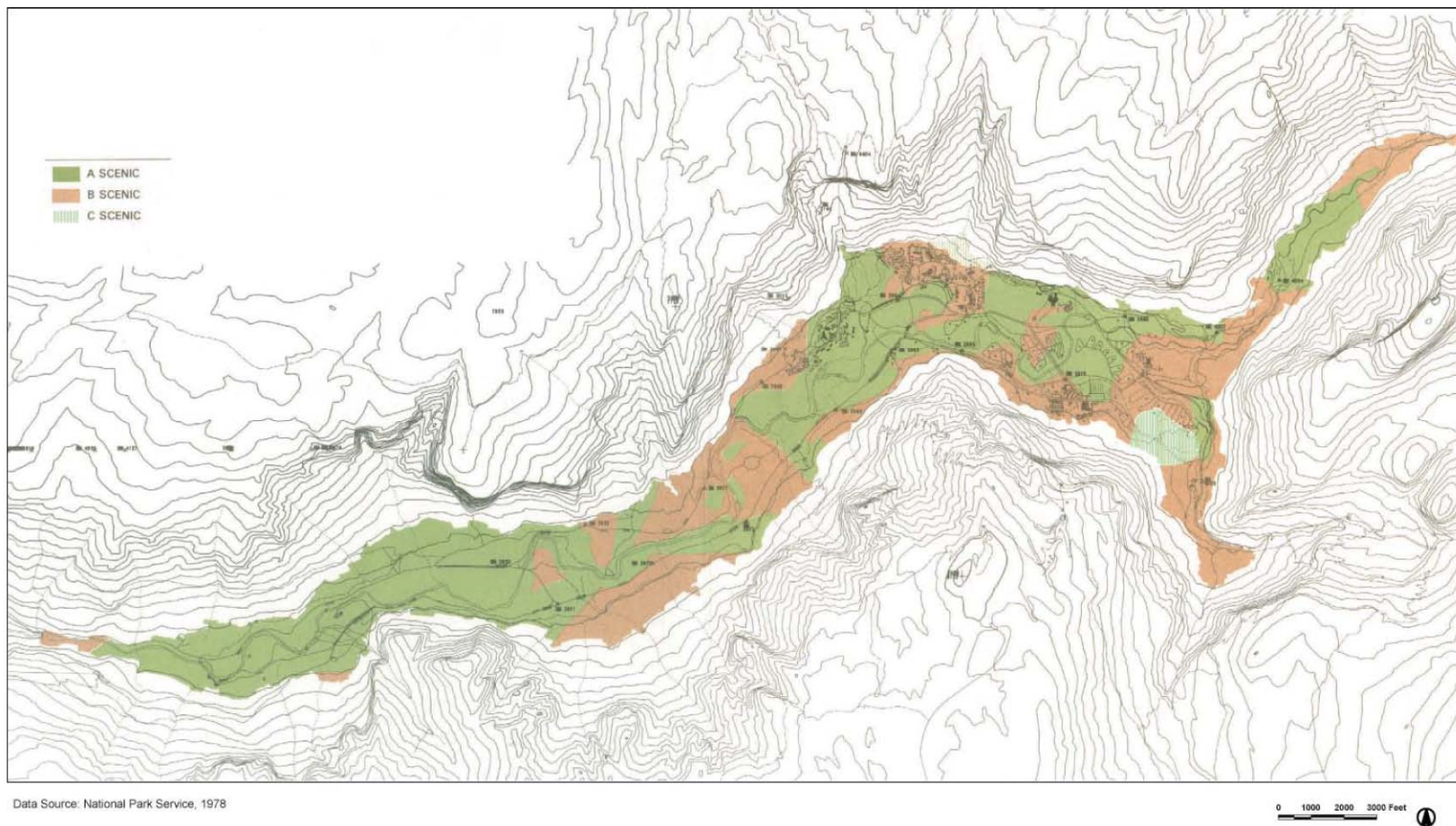
**Photo SCN-4:** El Capitan – 2009 (Yochim 2009) **Photo SCN-5:** Half Dome – 2010 (Yochim 2010)

The viewpoint analysis conducted for the *Yosemite General Management Plan* identified areas in Yosemite Valley that were consistently selected by eminent early photographers and painters as the best areas to pursue their activities. The Merced River is featured prominently in many representations of the Valley as both a foreground subject in the river corridor and a scenic feature from outside the river corridor. When the existing and historical viewpoints were established for the *Yosemite General Management Plan* viewpoint analysis, Yosemite Valley was classified according to the following criteria:

- A-Scenic: Areas included in scenic views commonly chosen by eminent early photographers and painters, or included in the most significant scenic views that exist today (includes all meadows and the entire length of the Merced River in the Valley).
- B-Scenic: Areas included in scenic views less commonly chosen by historic photographers and painters, or that compose less-significant modern views based on park management observations.
- C-Scenic: Areas of minor scenic quality and areas that can absorb visual intrusion without detracting from either primary or secondary views.

The viewpoint analysis considered potential opportunities, as well as existing and historic viewpoints, and resulted in the development of the Yosemite Valley Scenic Analysis map (see **figure 9-38**). The acreage of the classification areas is as follows: 1,800 acres classified as A-Scenic, 1,116 acres classified as B-Scenic, and 73 acres classified as C-Scenic. In these areas, the study found visual intrusions resulting from human-made features and vegetation affected views, and the major visual intrusions were roads and traffic through Ahwahnee Meadow, Stoneman Meadow, and other meadows when viewing Half Dome and other important features of Yosemite Valley from the Valley floor (including





SOURCE: NPS, 1978

Merced River Comprehensive Management Plan and EIS

**Figure 9-38**  
Yosemite Valley Scenic Analysis

from lands in the Merced River corridor). Other major intrusions into the scenic beauty of the Valley included NPS and concessioner maintenance and warehouse facilities, Camp 6, Housekeeping Camp, and Curry Village (NPS 1980).

Views from trails, bridges, and vista points throughout Yosemite Valley continue to retain high aesthetic value. However, the built and natural environments have changed somewhat since the river was designated as Wild and Scenic and the Yosemite Valley segment was classified as Recreational. These changes include those associated with damaged and removed structures, meadow and riparian conditions, park visitation patterns, and altered conditions at scenic viewpoints, as described below.

The January 1997 flood caused perhaps the most significant change in views across the Yosemite Valley segment since completion of the viewpoint analysis. The flood damaged or destroyed approximately half of the lodging units at Yosemite Lodge (which were subsequently removed) as well as many campgrounds in the Merced River floodplain. Other more recent changes to the human-made environment include installation of curbing along Northside and Southside Drives, which reduced the number of cars that could be parked in the foreground of scenic resource views; completion of the Yosemite Falls project, which removed idling buses from distant views of the falls; replacement of Sentinel Bridge; and removal of employee housing (tent cabins) at Yosemite Lodge.

Over the past 20 years, the park has undertaken a number of meadow restoration projects, including the construction of meadow boardwalks, planting native vegetation, removing nonnative vegetation, and implementing monitoring programs. While meadow conditions continue to experience damage associated with ongoing informal trail use, soil disturbance, etc., overall meadow conditions have improved; as a result, direct views of meadows as well as the contribution of foreground meadow views to iconic scenic vistas have improved as well. Constrictions to the free-flowing condition of the Merced River occur at bridges with openings too small to accommodate spring floods, resulting in bank erosion which affects views of the river or other scenic resources where eroded areas are seen in the foreground. In addition, vegetation trampling associated with visitor access to river points also causes bank erosion. Both actions affect direct views of the river and long-range iconic views where the river is visible in the foreground (see Photo SCN-6).



**Photo SCN-6:** Informal trails along Merced River riverbank – 2010 (ESA 2010)

The *Scenic Vista Management Plan* describes vegetation changes that have affected scenic viewpoints, rates and ranks the quality of viewpoints, and defines limits on management actions based on ecological conditions. The *Scenic Vista Management Plan* (NPS 2011d) prioritizes sites based on a visual resource assessment. These assessments include scores (compiled points assigned to vividness, uniqueness, access



and intactness) for vista points as of 2009. Scores of 10 to 18 (the highest possible) are considered “high value,” scores above 7 to 9.99 are considered “medium value,” and scores of 7 and below are considered “low value.” The assessment results for sites in the Merced River corridor and for sites that provide views of the river and river-dependent resources are included in Appendix H. The assessment describes the iconic features visible from each vista point and provides recommendations for vegetation management actions that would improve scenic views. The study found that vegetation currently obstructs scenic views at many of the Valley (Segment 2) vista points due to conifer encroachment in the meadows. Scenic vistas can also be obscured by regional air pollution, which results in occasional haze during the summer (NPS and Colorado State University 2002). It is noted that specific initial management actions for vista points in or near the Tuolumne River Wild and Scenic River corridor or the Merced River Wild and Scenic River corridor will be analyzed and directed by the respective river plan. No actions will be taken on vista points within either Wild and Scenic River corridor until a Record of Decision (ROD) is signed for the respective river plans.

While a substantial number of structures were removed from Segment 2 following the January 1997 flood, and several restoration projects have been completed, a number of visual intrusions identified in the *Yosemite General Management Plan* remain throughout the Valley, including traffic, parking, and crowding at popular visitor attraction sites; roads and traffic through Ahwahnee, Stoneman, and other meadows; NPS and concessioner maintenance and warehouse facilities; Housekeeping Camp; and Cathedral Beach Picnic Area.

### ***Segment 3: Merced River Gorge***

Visual resources in the V-shaped Merced River gorge downstream from Yosemite Valley are somewhat limited because of the steep terrain and forest cover. Important views from the Merced River or its banks in the gorge include panoramic views of the steep walls and rock features that define the gorge, such as Pulpit Rock, the Rostrum, and Elephant Rock, as well as the Cascades and other spectacular rapids among giant boulders.

Roadway pullouts along Segment 3 allow for short- and long-range views of the river (see Photo SCN-7). The river and Cascades Fall are intermittently visible from vehicles traveling along El Portal Road and Big Oak Flat Road. Some structures in the gorge do intrude into



**Photo SCN-7:** Merced River Gorge – 2010 (Yochim 2010)

scenic views of Segment 3, such as the Cascades Powerhouse. However, these structures do not dominate the natural landscape from any viewpoint.

With the exception of El Portal Road and the structures described above, there are few visual intrusions along Segment 3. Views from the river and roads in the Merced River gorge continue to have high aesthetic value. However, regional air pollution periodically results in haze during the summer, which can limit views.

#### ***Segment 4: El Portal***

As the river gorge widens into the El Portal area, views are slightly expanded. As in Yosemite Valley and the Merced River gorge, the canyon walls are still steep in El Portal. No formal visual resource studies have been conducted for this portion of the Merced River, and the landscape viewed from in the Merced River corridor consists primarily of the river and the canyon walls. Because the vegetation has changed from a Sierran mixed conifer to oak woodland in the lower part of the Gorge, and because the canyon walls illustrate the geologic transition from granite to metasedimentary bedrock, the El Portal segment provides scenery that is different from other parts of the Merced River corridor in Yosemite. Distinct views of Chinquapin Fall to the east of El Portal are visible from several locations in Segment 4. Human-made structures (including stores, housing, a fuel station, a trailer village, park administrative facilities, aboveground utilities, abandoned infrastructure, and riprap) and Highway 140 are adjacent to the river and some of these structures contrast in color, materials, and form, and/or lack screening (trees) from views of the river.

#### ***Segments 5 and 8: South Fork Merced River Above and Below Wawona***

The South Fork Merced River above and below Wawona is largely inaccessible, with just a few trail crossings above Wawona and none below (see Photos SCN-8 and SCN-9). While no formal visual resource studies have been conducted for this portion of the river, the wilderness segments of the South Fork Merced River remain largely natural and undisturbed. As discussed in the previous sections, summer haze can also limit views to and in Segments 5 and 8.

Scenery that can be directly viewed from in the river corridor above Wawona is generally limited to the South Fork Merced River itself at trail crossings, as well as longer-range views from the trails to Breeze Lake, Chain Lakes, Buck Camp, and Wawona Point areas (see Photo SCN-10). Views from the river corridor include distant views of forests and granite features such as Wawona Dome. Scenery along the South Fork Merced River below.

Wawona is characterized by forested slopes descending to the meandering river, with intermittent gravel bars apparent. With river access difficult and few turnouts, viewing opportunities are typically brief and experienced by motorists from the road. One scenic viewpoint in Segment 8 below Wawona and one viewpoint that provides views to the South Fork Merced River above Wawona (Segment 5) are characterized in the *Scenic Vista Management Plan*, as summarized in Appendix H.



**Photo SCN-8:** South Fork Merced River above Wawona Crossing – 2010 (Yochim 2010)



**Photo SCN-9:** South Fork Merced River – 2010 (Yochim 2010)



**Photo SCN-10:** South Fork Merced River above Wawona from a ridge between Chain Lakes and Breeze Lake (Yochim 2010)



### ***Segments 6 and 7: Wawona Impoundment and Wawona***

Scenery viewed directly from in the river corridor in the Wawona area is primarily of the South Fork Merced River itself, with distant views of forests and granite features, such as Wawona Dome. In the foreground, views include managed landscapes throughout the private development in Section 35, which consists of the largest privately owned area in the park, and downriver to the Wawona Campground. In the broader context of the watershed, these elements do not dominate the landscape but are certainly apparent among the mix of landscapes in the region. The *Scenic Vista Management Plan Environmental Assessment* (described above for the valley segment) includes an evaluation of scenic viewpoints in Segment 7 and viewpoints that afford views of this segment; the visual resources assessment findings for these segments are presented in Appendix H.

### ***Environmental Consequences Methodology***

The impact analysis associated with scenic resources is based on comparisons between Alternative 1 (No Action) and Alternatives 2–6. The effects of each alternative are evaluated by analyzing potential impacts on natural and cultural landscape features and how impacts might be experienced by visitors. Professional judgment was applied to reach reasonable conclusions as to the context, intensity, duration, and type of potential impacts.

- **Context.** For the purposes of this analysis, only local impacts are considered. This includes impacts that would occur in the Merced River corridor.
- **Intensity.** Scenic resources impacts would be assessed based on a substantial: (a) change in existing landscape character, whether foreground, intermediate ground, or background, and be visible from viewpoints the NPS has identified as important; (b) change in access to historically important viewpoints; or (c) change in the visibility of a viewpoint. The magnitude of impacts to scenic resources, either on the physical component of the natural or cultural landscape (quantitative) or on how the change might be experienced (qualitative), is described as negligible, minor, moderate, or major.
  - **Negligible:** Effects would be undetectable by visitors.
  - **Minor:** Effects would be detectable, but would only impact areas that are not highly visible.
  - **Moderate:** Effects would be noticeable and would impact highly visible areas.
  - **Major:** Effects would be clearly detectable and would impact outstanding vista points identified by the Merced River Plan.
- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be short-lived or temporary, usually due to construction, restoration, or demolition activities. A long-term impact would have a permanent and continual effect.
- **Type.** Impacts are evaluated in terms of whether they would be beneficial or adverse to scenic resources in the Merced River corridor. Impacts are considered beneficial if the quality of the visual experience would be improved and adverse if the quality of the visual experience would be diminished.

## ***Environmental Consequences of Alternative 1 (No Action)***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), riprap and abandoned infrastructure would remain in the river channel and meadow floodplains. Informal trails in meadows would remain and conifers would continue to encroach in meadows. In addition, localized riverbank erosion and scouring effects associated with bridges would remain. This would continue to result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources. In addition, traffic congestion would continue to affect scenic views where seen in the foreground of the river and scenic views. Scenic vista management actions would not be implemented. Regional haze, as discussed in the “Air Quality” subsection, could adversely affect scenic vistas in the project area seasonally.

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

As discussed in the natural resources analysis topic subsection, Alternative 1 (No Action) would result in increased park visitation compared with existing conditions, based on projected population increases. Ongoing visitor use impacts on natural resources, such as the creation of informal trails, trampling of vegetation, and increased bank erosion, would continue similar to existing conditions and result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), high levels of bare ground and trampling associated with administrative pack stock grazing and informal trails would remain. This would result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources. These conditions would result in local, long-term, minor, adverse impacts on the scenic resources in Segment 1.

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Scenic resources and views from the Merced River and its banks in Segment 1 are largely uncompromised, with the exception of human use areas that affect the scenic quality of the segment (e.g., Merced Lake High Sierra Camp and associated stock corral, the Little Yosemite Valley Campground and associated composting toilet, the Little Yosemite Ranger Station, the Moraine Dome Backpackers Campground, and the Merced Lake Backpackers Campground). Under Alternative 1 (No Action), these facilities would continue to be present, consistent with existing conditions. Since park visitation could increase over existing levels, Segment 1 could experience a higher concentration of visitors than existing levels. In the absence of a comprehensive planning effort to manage increased



visitation, increased vegetation trampling, erosion, and other damage to resources could occur (as discussed in the natural resources impact subsections of this chapter), which would affect the scenic quality of Segment 1 where damaged resources are visible from scenic viewpoints or are in the foreground of a scenic viewpoint. It is not expected that access to historically important viewpoints would change or that changes in the visibility of a viewpoint would occur. Alternative 1 would result in local, long-term, minor, adverse impacts on the scenic resources of Segment 1.

In summary, under Alternative 1 (No Action), scenic resources and views from the Merced River and its banks in Segment 1 would continue to be largely uncompromised. However, the continued presence of human-made structures and areas of disturbance continue to detract from the scenic quality of views and increased visitation could result in impacts on the scenic quality of Segment 1. No changes in access and visibility would occur under this alternative. Alternative 1 would result in local, long-term, minor, adverse impacts on the scenic resources of Segment 1.

**Segment 1 Impact Summary.** Implementation of Alternative 1 (No Action) would result in local, long-term, minor, adverse impact on the scenic resources of Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), the Merced River could continue to widen in certain areas as a result of human-caused erosion, loss of bank vegetation, and trampling. Constrictions of the free-flowing condition of the Merced River would continue to result in acceleration of water velocity at bridges with openings too small to accommodate spring floods, resulting in continued erosion. The bridges themselves contribute to the landscape character of the area. Abutments and abandoned infrastructure associated with the former bridge at Happy Isles and the gage base, and Pohono Bridge gaging station would remain. Abandoned infrastructure would remain at many meadows and riparian areas. This would result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources, and these impacts could continue to occur similar to existing conditions.

The park would proceed with restoration projects at Bridalveil, Cook's, and El Capitan meadows, as well as riverbank restoration at North Pines Campground. The park would also continue invasive species control and conifer removal from some meadows. These projects and activities would improve the scenic quality of these areas. As noted above, the *Scenic Vista Management Plan* describes vegetation changes that have resulted in intrusions on scenic viewpoints, ranks the quality of viewpoints, and defines limits on management actions based on ecological conditions. There are approximately 50 scenic vista points identified within Segment 2 or near Segment 2 that provide views of the segment with recommended vegetation management to improve scenic view quality. These vegetation management actions would not be implemented under Alternative 1 (No Action). Alternative 1 (No Action) would therefore result in local, long-term, minor to moderate, adverse impacts on the scenic resources of Segment 2.

### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Change in access to historically important viewpoints is not expected to occur under Alternative 1 (No Action). Because park visitation is anticipated to increase 3% annually over existing levels, Segment 2 could experience a higher concentration of visitors than existing levels. Though applicable throughout the park, human-caused erosion and other resource damage is likely to be much more of a concern in Yosemite Valley than in the Wilderness, El Portal, or Wawona because of the Valley's much higher concentration of visitors. In the absence of a comprehensive planning effort to manage increased visitation and improve banks or bridges in areas where they currently constrict the free-flowing condition of the river, increased damage to resources would occur. These actions affect direct views of the river and long-range iconic views where the river is visible in the foreground.

Under Alternative 1 (No Action), facilities that are visible within the foreground of views of the river or other scenic viewpoints (including roads and traffic through Ahwahnee, Stoneman, and other meadows when viewing Half Dome from the Valley floor, NPS and concessioner maintenance and warehouse facilities, and Housekeeping Camp) would continue to be present, consistent with existing conditions. Design and construction of new structures and renovation of existing structures would be subject to the design guidelines requirements of *A Sense of Place*. Alternative 1 (No Action) would therefore result in local, long-term, minor to moderate, adverse impacts on the scenic resources of Segment 2.

**Segment 2 Impact Summary.** Under Alternative 1 (No Action), scenic resources and views of and from the Merced River and its banks in Segment 2 would continue to retain high aesthetic value. However, the continued presence of visual intrusions, some structures and facilities, and increased visitation could result in impacts on the scenic quality of Segment 2. Some meadow restoration and riverbank restoration projects, and invasive species removal would improve scenic quality and the visibility of a number of scenic viewpoints. Overall, there would be no change in access under Alternative 1. Alternative 1 (No Action) would result in local, long-term, minor to moderate, adverse impacts on the scenic resources of Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Scenic resources and views from the Merced River and its banks in the Merced River Gorge include short- and long-range views of the river. Abandoned infrastructure and human-made structures would continue to be present at in El Portal, as described in Regional Scenic Context. This would result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources, and these impacts could continue to occur similar to existing conditions.

As noted above, the Scenic Vista Management Plan describes vegetation changes that have resulted in intrusions on scenic viewpoints, ranks the quality of viewpoints, and defines limits on management actions based on ecological conditions. The quality of viewpoints was scored based on vividness, uniqueness, and intactness of the viewpoints. There is one scenic vista point identified within Segment 3, and more than 10 that provide views to the segment. The plan includes recommendations

for vegetation management to improve scenic view quality. These vegetation management actions would not be implemented under Alternative 1 (No Action). Consequently, Alternative 1 (No Action) would result in local, long-term, minor, adverse impacts on the scenic resources of Segments 3 and 4. **Impacts of Actions to Manager User Capacity, Land Use, and Facilities**

Because park visitation is expected to increase over existing levels, Segment 3 could experience a higher concentration of visitors than existing levels. In the absence of a comprehensive planning effort to manage increased visitation, increased vegetation trampling, erosion, and other damage to resources could occur. Access from the El Portal Road and Highway 140 to the river is largely via informal trails, some of which are eroding into the river and would continue to erode with increased visitation. Damage to resources would affect the scenic quality of Segments 3 and 4 where the resources are visible from scenic viewpoints or are in the foreground of a scenic viewpoint.

The El Portal Administrative Site was established by Congress in 1958 to allow relocation of operations and maintenance utilities, facilities, and services out of the park. Roadside parking and river access are largely informal, and while river use levels are low enough such that informal access is acceptable, increased visitation could result in bank erosion and vegetation trampling, which would affect the overall scenic quality of the area. Alternative 1 (No Action) would therefore result in local, long-term, minor, adverse impacts on the scenic resources of Segments 3 and 4. In summary, under Alternative 1 (No Action), scenic resources and views from the Merced River and its banks in Segments 3 and 4 would continue to be largely uncompromised. However, the continued presence of human-made structures would continue and increased visitation could result in impacts on the scenic quality of Segments 3 and 4. Increased park visitation could result in damage to resources that would affect the scenic quality of these segments. Implementation of the *Scenic Vista Management Plan* would not occur. Overall, there would be no change in access under Alternative 1. Alternative 1 (No Action) would result in local, long-term, minor, adverse impacts on the scenic resources of Segments 3 and 4.

**Segments 3 & 4 Impact Summary.** Implementation of Alternative 1 would result in local, long-term, minor, adverse impacts on the scenic resources of Segments 3 & 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Scenic resources and views from the river and its banks along the South Fork Merced River are largely natural and undisturbed and have high aesthetic value. However, there are existing structures and facilities in the Segment 7 viewshed, including the Wawona maintenance yard, Wawona RV dump station, and abandoned metal pipes in South Fork Merced River side channels. These structures and facilities would continue to be present under Alternative 1 (No Action). In addition, vegetation trampling and bank erosion has occurred in the vicinity of campgrounds and picnic areas. This would result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources, and these impacts could continue to occur similar to existing conditions.

As noted above, the *Scenic Vista Management Plan* describes vegetation changes that have resulted in intrusions on scenic viewpoints, ranks the quality of viewpoints, and defines limits on management actions based on ecological conditions. The quality of viewpoints was scored based on vividness, uniqueness, and intactness of the viewpoints. There are approximately 9 scenic vista points identified within these segments or near Segment 3 that provide views of the segment. The *Plan* recommends vegetation management to improve scenic view quality at these locations. These vegetation management actions would not be implemented under Alternative 1 (No Action). The resulting impacts on the scenic resources of Segments 5, 6, and 7 would continue to be local, long-term, minor, and adverse.

### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Since park visitation could increase over existing levels, Wawona could experience a higher concentration of visitors than existing levels, which could result in further trampling of vegetation and damage to resources. Damage to resources would affect the scenic quality of the segments where the resources are visible from scenic viewpoints or are in the foreground of a scenic viewpoint. Alternative 1 (No Action) would result in local, long-term, minor, adverse impacts on the scenic resources of Segments 5, 6, 7, and 8.

**Segments 5-8 Impact Summary.** Under Alternative 1 (No Action), scenic resources and views from the South Fork Merced River and its banks would continue to be largely uncompromised. However, the presence of human-made structures would continue and increased visitation could result in impacts on the scenic quality of the segments. Overall, there would be no change in access under Alternative 1. The resulting impacts on the scenic resources of Segments 5, 6, and 7 would continue to be local, long-term, minor, and adverse.

### **Summary of Alternative 1 (No Action) Impacts**

In the absence of a comprehensive planning effort to manage increased visitation, reduce human-made structures, and restore areas of natural resource damage, scenic resources impacts would continue. These effects would be most pronounced in areas with concentrated facilities that intrude on the landscape character of the river segments and visitor use (e.g., Yosemite Valley and Wawona) that result in vegetation trampling, erosion, and other resource damage that affects the scenic quality of the segment where the resources are visible from scenic viewpoints or are in the foreground of a scenic viewpoint. NPS administrative requirements do afford some protection to the river from future actions, but no comprehensive or unified plan exists to protect the scenic resources of the Merced River. Alternative 1 (No Action) would have a local, long-term, minor to moderate, adverse impact on scenic resources.

### **Cumulative Impacts of Alternative 1 (No Action)**

The discussion of cumulative impacts on scenic resources is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of Alternative 1 (No Action). The projects identified below include those projects that have the potential to affect the scenic resources of the Merced River.

### ***Past Actions***

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include removal of structures and restoration of natural drainage features and meadow restoration and removal of vegetation that blocked scenic views. Specific examples of past projects include the following:

***Restoration/Removal:*** Cascades Housing Removal, Cascades Diversion Dam Removal, Happy Isles Gauging Station Bridge Removal, Cook's Meadow Ecological Restoration, Fern Springs Restoration, Happy Isles Fen Habitat Restoration Project, Merced River Ecological Restoration at Eagle Creek Project, Wawona Tunnel View Project, Lower Yosemite Fall Project

***Facility Development:*** Bridges provide scenic viewing opportunities and are viewed by some visitors as scenic features.

Adverse impacts from past actions include the introduction of obstructions in the Merced River channel, which results in bank erosion, and the introduction of facilities that intrude on the scenic quality of the river. Specific examples of such past projects include the following:

***Modified Hydrological Features:*** Previous development of bridges, riprap, dikes, flood walls, impoundments, dams, and facilities in the river channel or floodplain.

***Facility Development:*** Curry Village Employee and Temporary Housing and Showerhouse

### ***Present Actions***

Present actions contribute to similar beneficial and adverse impacts as described for past actions.

Beneficial impacts for present actions are similar to those discussed for past actions. Specific examples of present projects include the following:

***Management and Planning:*** Half Dome Trail Stewardship Plan, 2004 Fire Management Plan/EIS, upcoming Yosemite Wilderness Stewardship Plan/EIS

Adverse impacts from present actions are similar to those discussed for past actions. Specific examples of present projects include the following:

***Facility Development:*** East Yosemite Valley Utilities Improvement Plan/EA, Wauhoga Indian Cultural Center, Parkwide Communication Data Network, Yosemite Environmental Education Campus

### ***Reasonably Foreseeable Future Actions***

Impacts from future actions would be similar to those discussed for past and present actions. The Yosemite Wilderness Stewardship Plan/EIS (Management and Planning) is an example of a future projects with beneficial impacts.

### ***Overall Cumulative Impact***

Overall development and recreational uses in the Merced River watershed have resulted in localized, long-term, minor to moderate, adverse impacts on scenic resources. A number of past, present, and future projects have limited or would limit visitor uses through planning (which decreases the potential for secondary scenic resources effects), or restore vegetation and river banks, though the overall impact remains adverse. Alternative 1 (No Action) would contribute to worsening localized, adverse conditions in areas with concentrated visitor use and through the continued presence of facilities and infrastructure that are visible within scenic views, and presence of vegetation that is blocking scenic views. Cumulatively, the scenic resources impacts would be local, long term, minor to moderate, and adverse.

### ***Environmental Consequences Common to Alternatives 2–6***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Actions that would take place throughout the Merced River corridor under Alternatives 2–6 include removal of riverbank riprap and abandoned infrastructure in the river channel where possible. Denuded vegetation and informal trails would be restored in several meadows, and beach access and trails would be defined and delineated. In addition, areas of riverbank erosion would be repaired (see Appendix E). Selected scenic vista points would be improved by thinning of conifers and other trees that encroach on views (see Appendix H). Restoration activities would result in short-term, temporary intrusions into views when construction and restoration activities and equipment would be visible from area trails and visitor use areas. However, implementation of these actions would remove areas of resource damage that detract from the scenic quality of the river corridor and adjacent areas. Upon completion of restoration activities, restored areas would be more natural in appearance. Regional haze could adversely affect scenic vistas in the project area seasonally. The resulting impact on scenic resources would be local, long-term, minor, and beneficial.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, the Merced River and its banks in Segment 1 would remain largely uncompromised. Implementation of these alternatives would include restoration of informal trails and other denuded areas at Merced Lake meadow and shoreline. Implementation of these actions would remove areas of resource damage that detract from the scenic quality of the Merced Lake area. Upon completion of restoration activities, the Merced Lake area would be more natural in appearance, as viewed from the Merced Lake Trail and the visitor use areas that would be retained. Views of Merced Lake shoreline and meadows would be improved where restoration areas are in the foreground, as well as views of peaks where restored areas are in the foreground. The resulting impact on the scenic resources of Segment 1 would be local, long-term, minor, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, minor, beneficial impacts on scenic resources of Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

In the Happy Isles area, the former Happy Isles footbridge footings and river gage base would be removed from the bed and banks of the Merced River; informal trails would be revegetated; and wayfinding between Happy Isles and the Mist Trail from the shuttle stop would be improved to discourage further formation of informal trails. In addition, bank improvements would be installed downstream of the Happy Isles road bridge. These actions would improve the scenic quality of the area by reducing the number of human-made structures in the area and restoring vegetation, as seen from the Mist Trail, and would improve the scenic quality of the river in the area of the riverbank improvements, including views from the road bridge and the bicycle path on the downstream side of the bridge. The resulting impact on scenic resources would be local, long-term, minor, and beneficial.

In the Lower Pines and North Pines campground areas, campsites would be removed. Riverbank conditions would be improved downstream of Clark's and Ahwahnee bridges. In addition, river access would be improved to direct visitors to access points at sandy beach areas, which would reduce riparian vegetation and riverbank damage. River general restoration activities would be conducted as applicable, including riprap removal, removal of informal trails, and riverbank restoration in the area between Clark's and Stoneman bridges. These actions would reduce the number of human-made structures in the area and improve the condition of riparian vegetation and riverbanks, which would improve views of the river from the Clark's Bridge (Scenic Vista point 7), beach areas, and trails that cross the area. The resulting impact on scenic resources would be local, long-term, minor, and beneficial.

In the Housekeeping Camp area, lodging units and associated structures would be removed and restored, including removal of riprap upstream of the Housekeeping footbridge and downstream of the camp. In addition, general restoration activities would be conducted as applicable, including removal of informal trails and revegetation. These actions would reduce the number of human-made structures in the area and improve the condition of riparian vegetation and river banks, which would improve views of the river from the Housekeeping footbridge (Scenic Vista point 92), Housekeeping Beach (Scenic Vista point 26), Housekeeping Bridge Trail, Southside Drive, and the adjacent bicycle path. Views of North Dome, Glacier Point, Yosemite Falls, El Capitan, and Cathedral Rocks from the scenic vista points with the restoration areas in the foreground would be improved. The resulting impact on scenic resources would be local, long-term, minor to moderate, and beneficial.

Bank restoration downstream of Sentinel Bridge would be implemented. In addition, roadbed and roadside parking improvements would be implemented adjacent to Cook's Meadow. Roadside parking improvements would also be implemented along Sentinel Drive crossover. Improvements would also be made to areas of Sentinel Meadow and the boardwalk. These actions would improve the scenic quality and appearance of the meadows as seen from the boardwalk, trails, and Northside Drive, and also



improve views of north Valley wall scenic features as seen from the Sentinel Meadow boardwalk vista point (24). The resulting impact on scenic resources would be local, long-term, minor, and beneficial.

A number of restoration actions are proposed in the area between Swinging Bridge and El Capitan Picnic Area, in addition visitor use facility improvements that would focus visitor use away from sensitive resource areas. Riverbank restoration would occur downstream from Swinging Bridge. The Swinging Bridge and Sentinel Beach picnic areas and day use areas would be improved and nearby sensitive habitat would be restored. Informal trails would be removed from Leidig Meadow, bicycle path areas would be improved, and additional meadow restoration activities would be implemented. In addition, general restoration activities would be conducted as applicable, including removal of informal trails and revegetation. Bank conditions and riparian vegetation restoration would improve the scenic quality of the river, including views from Swinging Bridge beach and Swinging Bridge, and of the bridge itself (Scenic Vista points 22 and 23) and of the Swinging Bridge Picnic Area. Views of restored meadows as seen from these areas, as well as vista points on the west end of Leidig Meadow, would also be improved (Scenic Vista points 31). In addition, views of Yosemite Falls, North Dome, Sentinel Rock, Cathedral Rocks, Washington Column, and other iconic vistas with the river and/or meadows in the foreground would be improved. The resulting impact on scenic resources would be local, long-term, minor to moderate, and beneficial.

A number of restoration actions are proposed in the area between El Capitan Picnic Area and the Bridalveil parking lot, in addition to visitor use facility improvements. Bridalveil Meadow would be restored in an area near El Capitan moraine, in addition to Eagle Creek Meadow and Slaughterhouse Meadow. River access points would be improved and nearby sensitive habitat would be restored. In addition, general restoration activities would be conducted as applicable, including removal of informal trails and revegetation. Improved bank and meadow would improve the quality of views, particularly as seen from Northside Drive and the Valley Loop Trail. In addition, views of El Capitan and Cathedral Rocks, with restoration areas in the foreground, would be improved.

In the Bridalveil Meadow area, the riverbank and meadow would be restored, and conifers encroaching on the meadow would be removed. The park would remove one and pave and formalize five other roadside pullouts for river access between Pohono Bridge and the intersection of the Big Oak Flat Road. The former sewer plant area would be restored and an abandoned gaging station at Pohono Bridge would be removed and the area restored. In addition, general restoration activities would be conducted as applicable, including removal of informal trails and revegetation. These actions would generally reduce human-made structures and/or reduce ongoing disturbance within these areas by improving riverbank, riparian vegetation, and meadow conditions, which would improve the quality of views of the river and meadows. Conifer removal would open view of the meadow, particularly as seen from Northside Drive and the Valley View roadside turnout (Scenic Vista point 146). The resulting impact on scenic resources would be local, long-term, minor to moderate, and beneficial.

Throughout Segment 2, there are several isolated restoration and resource protection measures that would result in improvement in the scenic quality of the immediate area. However, these restorations are in heavily wooded areas that are not in the vicinity of the river, meadows, or other scenic resources. The impacts of these actions would be local, long-term, negligible, and beneficial.

***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternatives 2–6, an interpretive nature walk would be constructed through the Lower River area that emphasizes river-related processes, and the Upper Pines dump would be moved away from the river. Yosemite Lodge concessioner housing would be removed, several picnic areas would be improved, and use areas would be directed away from sensitive resource areas. Several other structures would be removed or relocated away from the river. Creation of an interpretive nature walk would result in a small increase in human-made structures in the area. However, these changes would be minor and would not substantially affect views of the river where the trail is in the foreground. Furthermore, an interpretive nature walk could improve visitor understanding and appreciation of the scenic resources and vistas in this area. These actions would improve the scenic quality of the area by reducing the number of human-made structures in the area, providing educational opportunities focused on scenic view opportunities, and protect the riverbank and riparian vegetation. Views of the river with the restoration areas in the foreground would be improved. Design and construction of new structures and renovation of existing structures would be subject to the design guidelines requirements of *A Sense of Place*. The resulting impact on scenic resources would be local, long-term, minor to moderate, and beneficial.

**Curry Village and Campgrounds.** The park would remove the Happy Isles Snack Stand at Curry Village. At The Ahwahnee, the park would remove the swimming pool and tennis courts; redesign, formalize, and improve drainage within the existing parking lot; and construct a new 50 parking space lot east of the current parking area. These actions would generally improve the scenic quality of the area by reducing the number of human-made structures. Parking expansion would increase human-made structures, but these would not be expected to impact scenic views. The resulting impact would be local, long-term, negligible, and beneficial.

**Camp 6 and Yosemite Village.** The park would remove from Yosemite Village the Concessioner General Office, Concessioner Garage, and the Arts and Activities Center (Bank Building), and repurpose the Village Sports Shop for public use. It would also construct a new maintenance building near the Government Utility Building. The park would remove roadside parking along Sentinel Drive and expand Camp 6 parking into the footprint of the Valley Garage. To improve visitor access between the Camp 6 area and Village, the park would construct a pathway connecting the new Camp 6 parking lot with the repurposed Village Sports Shop. The repurposing and replacement of structures within already developed areas would not be expected substantially increase the number of human-made structures or impact scenic views. The resulting impact would be local, long-term, negligible, and adverse.

**Camp 4 and Yosemite Lodge.** The park would remove the NPS Volunteer Office, post office, swimming pool, and snack stand. It would also remove old and temporary employee housing (Thousands Cabins and Highland Court) and replace it with new housing. In addition, the park would relocate the Yosemite Lodge maintenance and housekeeping facilities and repurpose the food court. These actions would reduce the number of human-made structures in the area, thereby improving the natural character of these areas. The resulting impact would be local, long-term, negligible, and beneficial.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in segment-wide, long-term moderate, beneficial impacts on scenic resources in Segment 2. Actions to manage

user capacities, land use, and facilities would have local, long-term, minor, beneficial impacts on scenic resources within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, the abandoned infrastructure and imported fill would be removed at the Cascades Picnic Area, Abbieville, and Trailer Village. Management actions proposed for Segment 3 include restoration activities would be conducted as applicable, including removal of informal trails, riverbank restoration, riparian zone protection, and revegetation. Management actions proposed for Segment 4 include riverbank protection and trail, road, and structure removal and restoration. In addition, general restoration activities would include removal of informal trails, bank restoration, riparian zone protection, and revegetation. The Greenemeyer sand pit would be restored to natural conditions. These actions would improve the scenic quality of restoration areas and views of the river in the vicinity of these areas, as seen from Highway 140 and El Portal Road. The resulting impact on scenic resources within Segment 4 would be local, long-term, minor to moderate, and beneficial.

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternatives 2–6, 31 employee housing units would be constructed in the El Portal area, increasing the number of human-made structures in Segment 4. However, the new structures would be in areas of existing development and would not substantially affect the scenic quality of the river corridor and adjacent areas. The resulting impact on scenic resources within Segment 4 would be local, long-term, minor, and adverse.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in segment-wide, long-term minor to moderate, beneficial impacts on scenic resources in Segment 4. Actions to manage user capacities, land use, and facilities would have local, long-term, minor, adverse impacts on scenic resources within Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, the Wawona RV dump site would be relocated away from the river, and river access and picnicking would be delineated at the South Fork Merced River Picnic Area to focus public use away from areas subject to riverbank erosion. Restoration activities would result in short-term, temporary intrusions into views when construction and restoration activities and equipment would be visible from area trails and visitor use areas. However, implementation of these actions would remove areas of resource damage that detract from the scenic quality of the river corridor and adjacent areas, and views of the river with restoration areas in the foreground. Upon completion of restoration activities, restored areas would be more natural in appearance. The resulting impact on scenic resources within Segment 7 would be local, long-term, minor, and beneficial.

***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternatives 2–6, an operations building and grounds facility would be constructed, thus increasing the number of human-made structures in this area. However, the new structures would be in areas of existing development and would not substantially affect the scenic quality of the river corridor and adjacent areas. The resulting impact on scenic resources within Segment 7 would be local, long-term, minor, and adverse.

**Wawona.** The park would redesign the bus stop at the Wawona Store to accommodate increased visitor use. However, the new structures would be in areas of existing development and would not substantially affect the scenic quality of the river corridor and adjacent areas. The resulting impact on scenic resources within Segment 7 would be local, long-term, negligible, and adverse.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values would result in segment-wide, long-term minor, beneficial impacts on scenic resources in Segment 7. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on scenic resources within Segment 7.

**Summary of Impacts from Actions Common to Alternatives 2-6**

The alternatives include several common restoration actions that would improve the appearance of riverbanks, meadows, and riparian vegetation, and a number of actions that would result in removal of human-made structures and paved/graded areas. These actions would improve the scenic quality of restoration areas and views of the river and meadows in the vicinity of restoration areas. In addition, views from scenic vistas with restoration areas in the foreground would be improved. New facilities or structures included in management actions are proposed in existing developed areas, would adhere to the park's design guidelines, and would not result in reduced scenic quality. Overall, with implementation of MM-VEX-2, as appropriate, (see Appendix C), actions common to Alternatives 2-6 would result in local, long-term, moderate, beneficial impacts on scenic resources.

***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration*****All River Segments*****Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

As discussed in the natural resources impact subsections of this chapter, Alternative 2 would result in reduced park visitation compared to Alternatives 2–6, which would reduce the potential for ongoing visitor use impacts on natural resources, such as creation of informal trails, trampling of vegetation, and increased riverbank erosion, which results in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources.

## **Segment 1: Merced River Above Nevada Fall**

### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Implementation of Alternative 2 would include conversion of the Little Yosemite Valley and Merced Lake Backpackers Camping Areas to dispersed camping, and the Moraine Dome Camping Area would be discontinued, along with general restoration activities as applicable in the Little Yosemite Valley area. Grazing of the Merced Lake East Meadow would be prohibited. Implementation of these actions would remove human-made structures and restore areas of resource damage that detract from the scenic quality of the area. Upon completion of restoration activities, the Little Yosemite Valley area would be more natural in appearance, as viewed from the Merced Lake Trail and the visitor use areas that would be retained. Views of the river would be improved where restoration areas are in the foreground, as well as views of peaks where restored areas are in the foreground.

Little Yosemite Valley Wilderness zone capacity would be decreased, which would substantially reduce trail use in the area between Little Yosemite Valley and Merced Lake. This action, in addition to reducing the number of overnight units available in Segment 1, would reduce overall visitation to the area compared to existing conditions. Therefore, the potential for ongoing visitor use impacts on the natural resources of Segment 1, as well as secondary effects on the scenic quality of the area would be reduced. Implementation of management actions related to visitor use management and facilities under Alternative 2 would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 1.

**Merced Lake High Sierra Camp.** Under Alternative 2, the Merced Lake High Sierra Camp would be removed and restored. Implementation of these actions would remove human-made structures that detract from the scenic quality of the Merced Lake area. Upon completion of restoration activities, the Merced Lake area would be more natural in appearance, as viewed from the Merced Lake Trail and the visitor use areas that would be retained. Views of Merced Lake shoreline and meadows would be improved where restoration areas are in the foreground, as well as views of peaks where restored areas are in the foreground. The resulting impacts on the scenic character of Segment 1 would be local, long-term, moderate, and beneficial.

**Segment 1 Impact Summary:** Implementation of management actions related to visitor use management and facilities under Alternative 2 would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, in addition to actions common to Alternatives 2–6, Stoneman, Sugar Pine, and Ahwahnee bridges would be removed and the riverbank areas would be restored. Additional meadow and riparian restorations would be implemented, including areas of Housekeeping Camp, Upper and Lower Rivers Campgrounds, Stoneman Meadow, El Capitan Meadow, and other highly visible meadow areas. All campgrounds and infrastructure in the 100-year floodplain would be removed, and

the floodplain and habitat would be restored. Implementation of these actions would remove areas of resource damage that detract from the scenic quality of the river corridor and adjacent areas, and views of the river with restoration areas in the foreground. Upon completion of restoration activities, restored areas would be more natural in appearance. However, it is noted that the bridges contribute to the scenic quality of the area and provide opportunities to view scenic areas, including the river. Implementation of management actions related to protecting and enhancing river values under Alternative 2 (including actions common to all alternatives) would result in local, long-term, moderate to major, beneficial impacts on the scenic resources of Segment 2.

### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternative 2, lodging units and would be reduced at Housekeeping Camp. Yosemite Village would be substantially retained, with some structures repurposed and several structures removed. Yosemite Lodge would be converted to day use, with some visitor uses repurposed and a campsite developed northwest of the lodge area. Several lodge buildings would be removed. Restoration activities would improve the scenic quality in the immediate vicinity of building removal and restoration areas. These actions would improve the scenic quality of the area by reducing the number of human-made structures in the area and restoring vegetation, and would improve the scenic quality of the river, including views from scenic viewpoints.

In addition, visitor use would be substantially reduced from existing conditions in Segment 2. This action, in addition to the above actions, would reduce the potential for ongoing visitor use impacts on the natural resources of the area that could result in secondary effects on the scenic quality of the area. Implementation of management actions related to visitor use management and facilities under Alternative 2 (including actions common to all alternatives) would result in local, long-term, moderate, beneficial impacts on the scenic resources of Segment 2.

**Curry Village and Campground.** The park would construct 78 new hard-sided units in Boys Town, bringing the total number of new and retained units at Curry Village to 433. The park would remove campsites from Lower Pines (32), North Pines (86), and Upper Pines (24). New structures would be constructed in an already developed area, generally within previously developed sites. These actions would collectively result in a reduction in human-made structures in the Curry Village and Campground areas, and a return to more natural conditions. The impact on scenic resources would, therefore, be local, long-term, minor, and beneficial.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. As these actions would occur within already developed areas and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, negligible, and adverse.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing between Camp 4 and Yosemite Lodge. The park would convert the Highland Court area to a walk-in campground; reconfigure pedestrian crossing of Northside Drive and Yosemite Lodge Drive, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses.

Conversion of the Highland Court area would have a beneficial impact by reducing the number of human-made structures in the area and return it to more natural conditions. Additional parking at Yosemite Lodge would have the opposite effect as it would increase the development footprint and bring more vehicles and visitors into this area. However, as these actions would occur within already developed areas and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in segment-wide, long-term moderate to major, beneficial impacts on scenic resources within Segment 2. Actions to manage user capacities, land use, and facilities would also have local, long-term, moderate to major, beneficial impacts on the scenic resources of Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 2.25-acre oak recruitment zone in the vicinity of Odger's fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. These measures would have a local, long-term, minor, beneficial impact on scenic resources in the vicinity of the former fuel station.

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternative 2, employee housing would be added to the Abbieville and Rancheria Flat, along with parking for these areas. These actions would increase the number of human-made structures in the area. However, these areas are currently developed, and the addition of these structures would not substantially decrease the scenic quality of the area. Overall, visitor use would be reduced from existing conditions, which would reduce the potential for ongoing visitor use impacts on the natural resources and associated secondary effects on the scenic quality of the area. Implementation of these actions would result in local, long-term, negligible to minor, adverse impacts on the scenic resources of Segment 4.

**Segments 3 & 4 Impact Summary:** Implementation of actions to protect and enhance river values would have a local, long-term, beneficial impact on scenic resources within Segment 4. Actions to management visitor use and facilities under Alternative 2 would result in local, long-term, negligible to minor, adverse impacts on the scenic resources of Segment 4. Segments 5, 6, 7, and 8: South Fork Merced River.

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, a portion of the maintenance yard would be restored and other structures would be removed. The Wawona Golf Course and tennis courts would be removed. Implementation of these management actions would improve the scenic quality of the restoration areas. In particular, the restored golf course restoration area would be visible from Chowchilla Road, Highway 41, and vista



points along that road. The impact on scenic resources of Segment 7 would be local, long-term, moderate, and beneficial.

### *Impacts of Actions to Manager User Capacity, Land Use, and Facilities*

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions would be expected to decrease overall visitation within this Segments 5-8.

As a result, the potential for ongoing visitor use impacts on the natural resources of Segments 5–8, and associated secondary effects on the scenic quality of these segments would be reduced.

Implementation these actions would result in local, long-term, minor, beneficial impacts on the scenic resources of Segments 5–8.

**Wawona Campground:** Under Alternative 2, the park would reduce the size of the Wawona Campground. Thirty-two campsites, or 33% of all campsites within Wawona, would be removed from the floodplain. These actions would further reduce visitation and the number of human-made structures in the vicinity, and restore the area to more natural conditions. The resulting impact on scenic resources within Segment 7 would be local, long-term, minor, and beneficial.

**Segments 5-8 Impact Summary:** Overall, implementation of management actions related to visitor use management and facilities under Alternative 2 would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segments 5–8.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Alternative 2 includes a substantial number of restoration actions that would improve the appearance of riverbanks, meadows, and riparian vegetation and a number of actions that would result in removal of human-made structures and paved/graded areas. These actions would improve the scenic quality of restoration areas and views of the river and meadows in the vicinity of restoration areas. In addition, views from scenic vistas with restoration areas in the foreground would be improved. New facilities or structures included in management actions are proposed in existing developed areas and would not result in reduced scenic quality. In addition, visitor use capacity management would be implemented, resulting in visitor use that is substantially lower than existing levels, which would reduce the potential for ongoing visitor use impacts on natural resources that could result in secondary effects on scenic resources. Overall, with implementation of MM-VEX-2, as appropriate, (see Appendix C), Alternative 2 would result in local, long-term, moderate to major, beneficial impacts on scenic resources.

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

The discussion of cumulative impacts to scenic resources is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of

Alternative 2. The projects identified below include those projects that have the potential to affect the scenic resources of the Merced River. See Appendix C for a full list of cumulative projects.

***Past, Present and Reasonably Foreseeable Actions***

Past, present and reasonably foreseeable actions that would contribute towards cumulative effects towards scenic resources under this alternative are the same as those listed for Alternative 1.

***Overall Cumulative Impact***

Overall development and recreational uses in the Merced River watershed have resulted in localized, long-term, minor to moderate, adverse impacts on scenic resources. A number of past, present, and future projects have beneficially limited uses through planning or restored vegetation and riverbanks, and management of vegetation that is blocking scenic views, although the overall impact remains adverse. Alternative 2 would result in local, long-term, moderate, beneficial impacts on scenic resources related to restoration activities throughout the planning area, removal of human-made structures, and reduced visitor use capacity, which result in overall improvement in the scenic quality of the planning area. Cumulatively, the impact on scenic resources would be local, long term, moderate, and beneficial.

***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

**All River Segments**

***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

As discussed in the natural resources impact subsections of this chapter and similar to Alternative 2, Alternative 3 would result in reduced park visitation compared to Alternative 1 (No Action), which would reduce the potential for ongoing visitor use impacts on natural resources, such as creation of informal trails, trampling of vegetation, and increased bank erosion. These visitor use impacts result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources.

**Segment 1: Merced River Above Nevada Fall**

***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternative 3, the Little Yosemite Valley Campground would be reduced and portions of the designated camping area would be restored, rather than restoration of the entire designated camping area and conversion to dispersed camping under Alternative 2. Merced Lake Backpackers Camping Area would be expanded. Grazing of the Merced Lake East Meadow would be regulated. Restoration activities and reduced visitor capacity would improve the scenic quality of Segment 1, and reduce ongoing visitor use impacts on the natural resources of the area and associated secondary impacts on the scenic quality of the area. Implementation of management actions related to visitor use

management and facilities under Alternative 3 would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 1.

**Merced Lake High Sierra Camp.** The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and use the former camp area for a temporary stock camp. Upon completion of restoration activities, despite the continued use of the area as a stock camp, the Merced Lake area would be more natural in appearance, as viewed from the Merced Lake Trail and the visitor use areas that would be retained. Views of Merced Lake shoreline and meadows would be improved where restoration areas are in the foreground, as well as views of peaks where restored areas are in the foreground. The resulting impacts on the scenic character of Segment 1 would be local, long-term, minor to moderate, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, minor to moderate, beneficial impacts on scenic resources in Segment 1.

## **Segment 2: Yosemite Valley**

### *Impacts of Actions to Protect and Enhance River Values*

Actions under Alternative 3 would be similar to Alternative 2 and would also result in an overall improvement in the scenic quality of Segment 2. For many actions, the meadow or riverbank restoration approach proposed under Alternative 3 would be different than that proposed for Alternative 2; however, the scenic quality of the restoration areas following restoration activities would be similarly improved. Implementation of management actions related to protecting and enhancing river values under Alternative 3 (including actions common to all alternatives) would result in local, long-term, moderate to major, beneficial impacts on the scenic resources of Segment 2.

### *Impacts of Actions to Manager User Capacity, Land Use, and Facilities*

A greater number of campsites would be retained and less restoration would occur under Alternative 3 than under Alternative 2. In addition, a recreational vehicle (RV) campground would be developed. However, the proposed expanded campground is in a heavily wooded area that could be seen from the bicycle path adjacent to the river and Happy Isles Loop Road. Views of the Merced River with the campground areas in the foreground would not be improved to the same degree as under Alternative 2, including views from Happy Isles bridge (Scenic Vista point 14), Clark's Bridge (Scenic Vista point 7), Housekeeping Camp footbridge (Scenic Vista point 92), Housekeeping Beach (Scenic Vista point 26), Housekeeping Bridge trail, Southside Drive, and the adjacent bicycle path and trails that cross this area. In addition, views of North Dome, Glacier Point, Yosemite Falls, El Capitan, and Cathedral Rocks from the scenic vista points with the campground areas in the foreground would not be improved to the same degree under Alternative 3 as under Alternative 2.

In Curry Village, a greater number of lodging units and parking spaces would be retained at the Curry Orchard Parking Area, than under Alternative 2. In the Yosemite Village area, some structures would be retained, rather than removed as under Alternative 2. Yosemite Lodge would be retained, rather

than converted to day use with a campground to the west as under alternative 2. However, these areas are in existing developed areas.

While Alternative 3 would retain more campground and overnight accommodations compared with Alternative 2, restoration activities and reduced visitor capacity would improve the scenic quality of Segment 2 and reduce ongoing visitor use impacts on the natural resources of the area that could result in secondary effects on the scenic quality of the area. Implementation of management actions related to visitor use management and facilities under Alternative 3 would result in local, long-term, moderate, beneficial impacts on the scenic resources of Segment 2.

**Curry Village and Campground.** The park would retain 355 guest units at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. These actions would collectively result in a reduction in human-made structures in the Curry Village and Campground areas, and a return to more natural conditions. The impact on scenic resources would, therefore, be local, long-term, minor, and beneficial.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. As these actions would occur within already developed areas and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, negligible, and adverse.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing to west of the Northside Drive and Yosemite Lodge Drive, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. Additional parking at Highland Court and Yosemite Lodge would bring more visitors and vehicles into these areas. In the latter case, the proposed actions would increase the development footprint within the area. However, as these actions would occur within already developed areas and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, long-term moderate to major, beneficial impacts on scenic resources within Segment 2. Actions to manage user capacities, land use, and facilities would also have local, long-term, moderate, beneficial impacts on the scenic resources of Segment 2.

## **Segments 3 and 4: Merced River Gorge and El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 2.25-acre oak recruitment zone in the vicinity of Odger's fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. These measures

would have a local, long-term, minor, beneficial impact on scenic resources in the vicinity of the former fuel station in Segment 4.

***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

New low- and medium-density housing and parking would be constructed as infill development in Rancheria, outside the 100-year floodplain. These actions would increase the number of human-made structures in the area. However, these areas are currently developed, and the addition of these structures would not substantially decrease the scenic quality of the area. Overall, visitor use would be reduced from existing conditions, which would reduce the potential for ongoing visitor use impacts on the natural resources and associated secondary effects on the scenic quality of the area.

Implementation of these actions would result in local, long-term, negligible to minor, adverse impacts on the scenic resources of Segment 4. Implementation of these actions would result in local, long-term, minor, adverse impacts on the scenic resources of Segment 4.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 4. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor, adverse impacts on the scenic resources of Segments 3 & 4.

**Segments 5, 6, 7, and 8: South Fork Merced River**

***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values within Segment 7 include removal of the Wawona Golf Course. Implementation of these management actions would improve the scenic quality of the restoration areas. In particular, the restored golf course restoration area would be visible from Chowchilla Road, Highway 41, and vista points along that road. The impact on scenic resources of Segment 7 would be local, long-term, moderate, and beneficial.

***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. Reduced visitor capacity would improve the scenic quality of the segments and reduce ongoing visitor use impacts on the natural resources of the area, and associated secondary effects on the scenic quality of the area. Implementation of these management actions would result in local, long-term, minor, beneficial impacts on the scenic resources of Segments 5–8.

**Wawona Campground.** Under Alternative 3, the park would reduce the size of the Wawona Campground. Twenty seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. These actions would further reduce visitation and the number of human-made structures in the vicinity, and restore the area to more natural conditions. The resulting impact on scenic resources within Segment 7 would be local, long-term, minor, and beneficial.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segments 5-8. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segments 5–8.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Alternative 3 would include a substantial number of restoration actions that would improve the appearance of riverbanks, meadows, and riparian vegetation, and a number of actions that would result in removal of human-made structures and paved/graded areas. These actions would improve the scenic quality of restoration areas and views of the river and meadows in the vicinity of restoration areas. In addition, views from scenic vistas with restoration areas in the foreground would be improved. New facilities or structures included in management actions are proposed in existing developed areas and would not result in reduced scenic quality. In addition, visitor use capacity management would be implemented, resulting in visitor use substantially lower than existing levels, which would reduce the potential for ongoing visitor use impacts on natural resources that could result in secondary effects on scenic resources. Overall, with implementation of MM-VEX-2, as appropriate, (see Appendix C), Alternative 3 would result in local, long-term, moderate to major, beneficial impacts on scenic resources.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The discussion of cumulative impacts to scenic resources is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of Alternative 3. The projects identified below include those projects that have the potential to affect the scenic resources of the Merced River.

#### ***Past, Present and Reasonably Foreseeable Actions***

Past, present and reasonably foreseeable actions that would contribute towards cumulative effects towards scenic resources under this alternative are the same as those listed for Alternative 1.

#### ***Overall Cumulative Impact***

Overall development and recreational uses in the Merced River watershed have resulted in moderate localized, long-term, minor to moderate, adverse impacts on scenic resources. A number of past, present, and future projects have beneficially limited uses through planning or restored vegetation and riverbanks, and management of vegetation that is blocking scenic views, although the overall impact remains adverse. Alternative 3 would result in local, long-term, moderate to major, beneficial impacts on scenic resources related to restoration activities throughout the planning area, removal of human-made structures, and reduced visitor use capacity which result in overall improvement in the scenic quality of the planning area. Cumulatively, the impact on scenic resources would be local, long-term, moderate, and beneficial.

## ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

As discussed in the natural resources impact sections and similar to Alternative 2, Alternative 4 would result in reduced park visitation compared to Alternative (No Action), which would reduce the potential for ongoing visitor use impacts on natural resources, such as creation of informal trails, trampling of vegetation, and increased bank erosion. These visitor use impacts results in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources. However, visitor use numbers would only be slightly reduced compared with Alternative 1 (No Action) and more visitation would result compared with Alternative 2. Visitor use management strategies would result in higher visitation than would occur under Alternative 2. Therefore, secondary impacts on scenic resources would not be improved to the same degree as Alternative 2 but could be improved compared to existing conditions.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternative 4, the Little Yosemite Valley Campground would be retained, rather than restoring the entire designated camping area and converting it to dispersed camping as under Alternative 2. Restoration and prohibitions on grazing of Merced Lake East Meadow, along with other general restoration activities would improve the scenic quality of the area, but not to the degree as would occur under Alternative 2. Therefore, improvement in scenic quality in Segment 1 would be less under Alternative 4 than under Alternative 2 because areas of barren ground, designated camping areas, and other human-made structures would be retained (and expanded at the Merced Lake Backpackers Camping Area), and therefore less restoration would be implemented. While more campground sites would be retained with Alternative 4 than with Alternative 2, restoration activities and reduced visitor capacity would improve the scenic quality of Segment 1 and reduce ongoing visitor use impacts on the natural resources of the area, which could result in secondary effects on the scenic quality of the area. Implementation of management actions related to visitor use management and facilities under Alternative 4 would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 1. Merced Lake High Sierra Camp. The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and restoration of the former camp area to natural conditions. Implementation of these actions would remove human-made structures that detract from the scenic quality of the Merced Lake area. Upon completion of restoration activities, the Merced Lake area would be more natural in appearance, as viewed from the Merced Lake Trail and the visitor use areas that would be retained. Views of Merced Lake shoreline and meadows would be improved where restoration areas are in the foreground, as well as views of peaks where restored areas are in the foreground. The resulting impacts on the scenic character of Segment 1 would be local, long-term, minor to moderate, and beneficial.



**Segment 1 Impact Summary:** Implementation of management actions related to visitor use management and facilities under Alternative 4 would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions under Alternative 4 in Segment 2 would be similar to Alternative 2 and would also result in an overall improvement in the scenic quality of this segment. For many actions, the meadow or riverbank restoration approach proposed under Alternative 4 would be different than that proposed under Alternative 2. In addition, slightly less road and trail removal/relocation would occur. However, the scenic quality of the restoration areas following restoration activities would be similarly improved. Implementation of management actions related to protecting and enhancing river values under Alternative 4 (including actions common to all alternatives) would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segment 2.

### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

A greater number of units would be retained under Alternative 4 than under Alternative 2. In addition, a recreational vehicle campground and a walk-in campground would be developed. However, riverbank, riparian, and other restoration actions would be implemented as under Alternative 2. The proposed expanded campground is in a heavily wooded area, but could be seen from the bicycle path adjacent to the river and Happy Isles Loop Road. The riverbank downstream of Stoneman Bridge would be restored; however, the bridge would be retained. Views of the Merced River with these areas in the foreground would not be improved under Alternative 4 to the same degree as Alternative 2, including views from Happy Isles bridge (Scenic Vista point 14), Clark's Bridge (Scenic Vista point 7), Housekeeping footbridge (Scenic Vista point 92), Housekeeping Beach (Scenic Vista point 26), Housekeeping Bridge Trail, Southside Drive, and the adjacent bicycle path and trails that cross the area. In addition, views of North Dome, Glacier Point, Yosemite Falls, El Capitan, and Cathedral Rocks from the scenic vista points with the campground areas in the foreground would be not be improved to the same degree under Alternative 4 as under Alternative 2.

In Curry Village, a greater number of lodging units and parking spaces would be retained under Alternative 4 than under Alternative 2. Yosemite Lodge would be retained, rather than converted to day use as under Alternative 2, and a campground would be developed. However, these areas are in existing developed areas.

While Alternative 4 would retain more campground and overnight accommodations compared with Alternative 2, restoration activities and maintained visitor capacity would improve the scenic quality of Segment 2 and maintain ongoing visitor use impacts on the natural resources of the area that could result in secondary effects on the scenic quality of Segment 2. Implementation of management actions related to visitor use management and facilities under Alternative 4 would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segment 2.

**Curry Village and Campground.** The park would retain 355 guest units and construct a new 40 site campground at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). New structures would be constructed in an already developed area, generally within previously developed sites. These actions would collectively result in a reduction in human-made structures in the Curry Village and Campground areas, and a return to more natural conditions. The impact on scenic resources would, therefore, be local, long-term, minor, and beneficial.

**Camp 6 and Yosemite Village.** The park would improve the configuration of and on-grade pedestrian crossing at the Northside Drive-Yosemite Village Drive intersection, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 750 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. Additional parking at Camp 6 would bring more visitors and vehicles into these areas. However, as the project would occur within the footprint of an already developed area, and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. Additional parking at Highland Court and Yosemite Lodge would bring more visitors and vehicles into these areas. In the latter case, the proposed actions would increase the development footprint within the area. However, as these actions would occur within already developed areas and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, long-term minor to moderate, beneficial impacts on scenic resources within Segment 2. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segment 2.

## **Segments 3 and 4: Merced River Gorge and El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 1-acre oak recruitment zone in the vicinity of Odger's fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. These measures would have a local, long-term, negligible, beneficial impact on scenic resources in the vicinity of the former fuel station in Segment 4.

### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

New high-density housing and parking would be constructed as infill development in Rancheria, outside the 100-year floodplain. These actions would increase the number of human-made structures in the area. However, these areas are currently developed, and the addition of these structures would not

substantially decrease the scenic quality of the area. Overall, visitor use would be reduced from existing conditions, which would reduce the potential for ongoing visitor use impacts on the natural resources and associated secondary effects on the scenic quality of the area. Implementation of these actions would result in local, long-term, minor, adverse impacts on the scenic resources of Segment 4. **Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 4. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor, adverse impacts on the scenic resources of Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions would be expected to decrease overall visitation within this Segments 5-8. As a result, the potential for ongoing visitor use impacts on the natural resources of Segments 5-8, and associated secondary effects on the scenic quality of these segments would be reduced. Implementation of these actions would result in local, long-term, minor, beneficial impacts on the scenic resources of Segments 5-8.

**Wawona Campground.** Under Alternative 4, the park would reduce the size of the Wawona Campground. Twenty-seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. These actions would further reduce visitation and the number of human-made structures in the vicinity, and restore the area to more natural conditions. The resulting impact on scenic resources within Segment 7 would be local, long-term, minor, and beneficial.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would also have local, long-term, minor, beneficial impacts on the scenic resources of Segments 5-8.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

A substantial number of restoration actions under Alternative 4 would improve the appearance of riverbanks, meadows, and riparian vegetation and a number of actions would result in removal of human-made structures and paved/graded areas. These actions would improve the scenic quality of restoration areas and views of the river and meadows in the vicinity of restoration areas. In addition, views from scenic vistas with restoration areas in the foreground would be improved. New facilities or structures included in management actions are proposed in existing developed areas and would not result in overall reduced scenic quality. In addition, visitor use capacity management would be implemented, resulting in visitor use being maintained at slightly less than or similar to existing levels, which would maintain the potential for ongoing visitor use impacts on natural resources, which could result in secondary effects on scenic resources. Overall, with implementation of MM-VEX-2, as appropriate, (see Appendix C), Alternative 4 would result in local, long-term, minor to moderate, beneficial impacts on scenic resources.

### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The discussion of cumulative impacts on scenic resources is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of Alternative 4. The projects identified below include those projects that have the potential to affect the scenic resources of the Merced River.

#### ***Past, Present and Reasonably Foreseeable Actions***

Past, present and reasonably foreseeable actions that would contribute towards cumulative effects towards scenic resources under this alternative are the same as those listed for Alternative 1.

#### ***Overall Cumulative Impact***

Overall development and recreational uses in the Merced River watershed have resulted in localized, long-term, minor to moderate, adverse impacts on scenic resources. A number of past, present, and future projects have beneficially limited uses through planning or restored vegetation and riverbanks, and management of vegetation that is blocking scenic views, although the overall impact remains adverse. Alternative 4 would result in local, long-term, moderate, beneficial impacts on scenic resources related to restoration activities throughout the planning area, removal of human-made structures, and reduced visitor use capacity, which result in overall improvement in the scenic quality of the planning area. Cumulatively, the impact on scenic resources would be local, long term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### **All River Segments**

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

As discussed in the natural resources impact subsections of this chapter, Alternative 5 would result in similar park visitation compared to Alternative 1 (No Action) and ongoing visitor use impacts on natural resources, such as creation of informal trails, trampling of vegetation, and increased bank erosion, which result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources, and these visitor use impacts could continue similar to existing conditions.

#### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Under Alternative 5, the Merced Lake Backpackers Camping Area would be retained. In addition, the Little Yosemite Valley and Moraine Dome Camping Areas would be retained, rather than being

restored and converted to dispersed camping as under Alternative 2. Wilderness zone capacity would be maintained at existing levels. Restoration and restrictions on grazing at Merced Lake East Meadow, and other general restoration activities would be implemented. As such, the scenic quality of the area would be improved, but not to the degree as would occur under Alternative 2 because the designated camping areas would be retained. Therefore, improvement in scenic quality in Segment 1 would be less under Alternative 5 than under Alternative 2 because areas of barren ground, designated camping areas, and other human-made structures would be retained; therefore, less restoration would be implemented. Maintenance of existing wilderness permit numbers could result in ongoing visitor use impacts on the natural resources of the area, and associated secondary effects on the scenic quality of the area, similar to existing conditions. Implementation of management actions related to visitor use management and facilities under Alternative 5 would result in local, long-term, negligible, beneficial impacts on the scenic resources of Segment 1.

**Merced Lake High Sierra Camp.** The park would reduce the capacity of the Merced Lake High Sierra Camp to 42 beds and replace the flush toilets with composting toilets. Continued operation of the facility, albeit at reduced capacity, would result in impacts similar to those of Alternative 1 (No Action) as the major components of the facility and its visitors would remain. The resulting impact would be local, long-term, negligible, and adverse.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, negligible, adverse impacts on scenic resources in Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Segment 2 actions under Alternative 5 would be similar to actions under Alternative 2 and would also result in an overall improvement in the scenic quality of this segment. For many actions, the meadow or riverbank restoration approach proposed under Alternative 5 would be different than under Alternative 2. In addition, slightly less road area would be removed at Ahwahnee Meadow. However, the scenic quality of the restoration areas after restoration activities would be similarly improved. Implementation of management actions related to protecting and enhancing river values under Alternative 5 (including actions common to all alternatives) would result in local, long-term, moderate, beneficial impacts on the scenic resources of Segment 2.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

A greater number of campsites would be retained under Alternative 5 than under Alternative 2. In addition, an RV campground and a walk-in campground would be developed. However, riverbank, riparian, and other restoration actions would be implemented as under Alternative 2. The proposed expanded campground is in a heavily wooded area, but could be seen from the bicycle path adjacent to the river and Happy Isles Loop Road. Restoration would occur at the former Upper River and Lower River campgrounds; however, due to the addition of campsites at Upper River, the total acreage of restoration would be less than that of Alternatives 2 through 4. The riverbank downstream of Stoneman Bridge would be restored; however, the bridge would be retained. Views of the Merced

River with the these areas in the foreground would not be improved to the same degree as with Alternative 2, including views from Happy Isles bridge (Scenic Vista point 14), Clark's Bridge (Scenic Vista point 7), Housekeeping footbridge (Scenic Vista point 92), Housekeeping Beach (Scenic Vista point 26), Housekeeping Bridge Trail, Southside Drive, and the adjacent bicycle path and trails that cross the area. In addition, views of North Dome, Glacier Point, Yosemite Falls, El Capitan, and Cathedral Rocks from the scenic vista points with the campground areas in the foreground would be not be improved under Alternative 5 to the same degree as under Alternative 2.

In Curry Village, most lodging units and parking spaces would be retained. Yosemite Lodge would be retained, rather than converted to day use as under Alternative 2. However, these areas are in existing developed areas.

Valley visitor capacity would be maintained at the same level as existing conditions. While Alternative 5 would retain more campground and overnight accommodations compared with Alternative 2, restoration activities and maintained visitor capacity would improve the scenic quality of Segment 2 and maintain ongoing visitor use impacts on the natural resources of the area that could result in secondary effects on the scenic quality of the area. Implementation of management actions related to visitor use management and facilities under Alternative 5 would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 2.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). New structures would be constructed in an already developed area, generally within previously developed sites. Campsite removal would reduce human-made structures in the Curry Village and Campground areas and return them to more natural conditions. The impact on scenic resources would, therefore, be local, long-term, negligible, and beneficial.

**Camp 6 and Yosemite Village.** The park would construct a pedestrian underpass and a traffic circle at the intersection of Northside and Yosemite Village Drives, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. The traffic circle, new intersection, and additional parking at Camp 6 would increase the development footprint and bring more visitors and vehicles into these areas. However, as these projects would occur largely within the footprint of an already developed area, and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would redevelop the disturbed footprint of the former Yosemite Lodge units removed after being damaged by the 1997 flood, design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. Additional parking at Highland Court and Yosemite Lodge would bring more visitors and vehicles into these areas. In the latter case, the proposed actions would increase the development footprint within the area. However, as these actions would occur within

already developed areas and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, long-term minor to moderate, beneficial impacts on scenic resources within Segment 2. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor, beneficial impacts on the scenic resources of Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a one-acre oak recruitment zone in the vicinity of Odger's fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. These measures would have a local, long-term, negligible, beneficial impact on scenic resources in the vicinity of the former fuel station in Segment 4.

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

New high-density housing and parking would be constructed as infill development in Rancheria, outside the 100-year floodplain. These actions would increase the number of human-made structures in the area. However, these areas are currently developed, and the addition of these structures would not substantially decrease the scenic quality of the area. Overall, visitor use would be reduced from existing conditions, which would reduce the potential for ongoing visitor use impacts on the natural resources and associated secondary effects on the scenic quality of the area. Implementation of these actions would result in local, long-term, minor, adverse impacts on the scenic resources of Segment 4.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 4. Actions to manage user capacities, land use, and facilities would have local, long-term, minor, adverse impacts on the scenic resources of Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions would not be expected to substantially change overall visitation within Segments 5-8. As a result, the potential for ongoing visitor use impacts on the natural resources of Segments 5-8, and associated secondary effects on the scenic quality of these segments would be similar to those of Alternative 1 (No Action). Implementation of these actions would result in local, long-term, negligible, beneficial impacts on the scenic resources of Segments 5-8.



**Wawona Campground.** Under Alternative 5, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. These actions would reduce overnight visitation and the number of human-made structures in the vicinity, and restore the area to more natural conditions. The resulting impact on scenic resources within Segment 7 would be local, long-term, negligible, and beneficial.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would also have local, long-term, negligible, beneficial impacts on the scenic resources of Segments 5–8.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Alternative 5 includes a substantial number of restoration actions that would improve the appearance of riverbanks, meadows, and riparian vegetation, and a number of actions that would result in removal of human-made structures and paved/graded areas. These actions would improve the scenic quality of restoration areas and views of the river and meadows in the vicinity of restoration areas. In addition, views from scenic vistas with restoration areas in the foreground would be improved. New facilities or structures included in Alternative 5 management actions are proposed in existing developed areas and would not result in overall reduced scenic quality. In addition, visitor use capacity management would be implemented, which would maintain in visitor use at existing levels and therefore maintain the potential for ongoing visitor use impacts on natural resources that could result in secondary effects on scenic resources. Overall, with implementation of MM-VEX-2, as appropriate, (see Appendix C), Alternative 5 would result in local, long-term, minor, beneficial impacts on scenic resources.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The discussion of cumulative impacts on scenic resources is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of Alternative 5. The projects identified below have the potential to affect the scenic resources of the Merced River.

#### ***Past, Present and Reasonably Foreseeable Actions***

Past, present and reasonably foreseeable actions that would contribute towards cumulative effects towards scenic resources under this alternative are the same as those listed for Alternative 1.

#### ***Overall Cumulative Impact***

Overall development and recreational uses in the Merced River watershed have resulted in localized, long-term, minor to moderate, adverse impacts on scenic resources. A number of past, present, and future projects have beneficially limited uses through planning or restored vegetation and riverbanks, and management of vegetation that is blocking scenic views, although the overall impact remains adverse. Alternative 5 would result in local, long-term, minor to moderate, beneficial impacts on scenic resources related to restoration activities throughout the planning area, removal of human-made

structures, and reduced visitor use capacity, which could result in overall improvement in the scenic quality of the planning area. Cumulatively, the impact on scenic resources would be local, long term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

As discussed in the natural resources impact subsections of this chapter, Alternative 6 would accommodate an increase in park visitation compared with Alternative 1 (No Action) and ongoing visitor use impacts on natural resources, such as creation of informal trails, trampling of vegetation, and increased bank erosion. These visitor use impacts would result in secondary scenic resources impacts where affected natural resources areas are in scenic views or are the foreground to scenic resources and could continue similar to existing conditions.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

The Merced Lake Backpackers, Little Yosemite Valley, and the Moraine Dome Camping Areas would be retained, rather than being restored and converted to dispersed camping as under Alternative 2. Wilderness zone capacity would be maintained at existing levels. Restoration and grazing restrictions at Merced Lake East Meadow, and other general restoration activities would be implemented. As such, the scenic quality of the area would be improved, but not to the degree as would occur under Alternative 2 because of the retention of designated camping areas. Therefore, improvement in scenic quality in Segment 1 would be less under Alternative 6 than under Alternative 2 because areas of barren ground, designated camping areas, and other human-made structures would be retained and, therefore, less restoration would be implemented. Maintenance of existing Wilderness permit numbers could result in ongoing visitor use impacts on the natural resources of Segment 1 that could result in secondary effects on the scenic quality of the area, similar to existing conditions. Implementation of management actions related to visitor use management and facilities under Alternative 6 would result in local, long-term, negligible, beneficial impacts on the scenic resources of Segment 1.

**Merced Lake High Sierra Camp.** Continued operation of the facility would result in impacts similar to those of Alternative 1 (No Action). The resulting impact would be local, long-term, negligible, and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, negligible, beneficial impacts on scenic resources in Segment 1.

## Segment 2: Yosemite Valley

### *Impacts of Actions to Protect and Enhance River Values*

Segment 2 actions under Alternative 6 would be similar to Alternative 2 and would also result in an overall improvement in the scenic quality of Segment 2. For many actions, the meadow or riverbank restoration approach proposed under Alternative 6 would be different than under Alternative 2. In addition, slightly less road area would be removed at Ahwahnee Meadow. However, the scenic quality of the restoration areas after restoration activities would be similarly improved. Implementation of management actions related to protecting and enhancing river values under Alternative 6 (including actions common to all alternatives) would result in local, long-term, moderate, beneficial impacts on the scenic resources of Segment 2.

### *Impacts of Actions to Manager User Capacity, Land Use, and Facilities*

A greater number of campsites would be retained under Alternative 6 than under Alternative 2. In addition, an RV campground and a walk-in campground would be developed. However, riverbank, riparian, and other restoration actions would be implemented, as under Alternative 2. The proposed expanded campground is in a heavily wooded area but could be seen from the bicycle path adjacent to the river and Happy Isles Loop Road. The riverbank downstream of Stoneman and Sugar Pine bridges would be restored; however, the bridges would be retained. Restoration would occur at the former Upper River and Lower River campgrounds; however, approximately half the acreage of restoration would be implemented compared to Alternatives 2 through 4. Views of the river with these areas in the foreground would not be improved under Alternative 6 to the same degree as under Alternative 2, including views from Happy Isles bridge (Scenic Vista point 14), Clark's Bridge (Scenic Vista point 7), Housekeeping footbridge (Scenic Vista point 92), Housekeeping Beach (Scenic Vista point 26), Housekeeping Bridge Trail, Southside Drive, and the adjacent bicycle path and trails that cross this area of Segment 2. In addition, views of North Dome, Glacier Point, Yosemite Falls, El Capitan, and Cathedral Rocks from the scenic vista points with the campground areas in the foreground would be not be improved under Alternative 6 to the same degree as under Alternative 2.

In Curry Village, most lodging units and parking spaces would be retained. Yosemite Lodge would be retained, rather than converted to day use as under Alternative 2. These areas are in existing developed areas.

The Valley visitor capacity would increase compared with Alternative 1 (No Action). Alternative 6 would retain more campground and overnight accommodations compared with Alternative 2, and ongoing visitor use impacts on the natural resources of the area could result in secondary effects on the scenic quality of the area could increase compared to Alternative 2. However, extensive meadow and riverbank restoration would be implemented. Implementation of management actions related to visitor use management and facilities under Alternative 6 would result in local, long-term, minor beneficial impacts on the scenic resources of Segment 2.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). New structures would be

constructed in an already developed area, generally within previously developed sites. Campsite removal would reduce human-made structures in the Curry Village and Campground areas and return them to more natural conditions. The impact on scenic resources would, therefore, be local, long-term, negligible, and beneficial.

**Camp 6 and Yosemite Village.** The park would expand the Concessioner Warehouse Building to accommodate Concessioner General Office functions, construct a pedestrian underpass and two roundabouts, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. The administrative facilities expansion, roundabout, new intersection, and additional parking at Camp 6 would increase the development footprint and bring more visitors and vehicles into these areas. However, as these projects would occur largely within the footprint of an already developed area, and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for 3 busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. Additional parking at Highland Court and Yosemite Lodge would bring more visitors and vehicles into these areas. In the latter case, the proposed actions would increase the development footprint within the area. However, as these actions would occur within already developed areas and not obstruct scenic vistas, the impacts upon scenic resources would be local, long-term, minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, minor, beneficial impacts on scenic resources within Segment 2. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, beneficial impacts on the scenic resources of Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal.**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 1-acre oak recruitment zone in the vicinity of Odger's fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. These measures would have a local, long-term, negligible, beneficial impact on scenic resources in the vicinity of the former fuel station in Segment 4.

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

New high-density housing and parking would be constructed as infill development in Rancheria and Abbieville, outside the 100-year floodplain. These actions would increase the number of human-made structures in the area. However, these areas are currently developed, and the addition of these structures would not substantially decrease the scenic quality of the area. Overall, visitor use would be reduced

from existing conditions, which would reduce the potential for ongoing visitor use impacts on the natural resources and associated secondary effects on the scenic quality of the area. Implementation of these actions would result in local, long-term, minor, adverse impacts on the scenic resources of Segment 4.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 4. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor, adverse impacts on the scenic resources of Segment 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Manager User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions would not be expected to substantially change overall visitation within Segments 5-8. As a result, the potential for ongoing visitor use impacts on the natural resources of Segments 5-8, and associated secondary effects on the scenic quality of these segments would be similar to those of Alternative 1 (No Action). Implementation of these actions would result in local, long-term, negligible, beneficial impacts on the scenic resources of Segments 5-8.

**Wawona Campground.** Under Alternative 6, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. These actions would reduce overnight visitation and the number of human-made structures in the vicinity, and restore the area to more natural conditions. The resulting impact on scenic resources within Segment 7 would be local, long-term, negligible, and beneficial.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would also have local, long-term, negligible, beneficial impacts on the scenic resources of Segments 5-8.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Alternative 6 includes a substantial number of restoration actions that would improve the appearance of riverbanks, meadows, and riparian vegetation, and a number of actions that would result in removal of human-made structures and paved/graded areas. These actions would improve the scenic quality of restoration areas, and views of the river and meadows in the vicinity of restoration areas. In addition, views from scenic vistas with restoration areas in the foreground would be improved. New facilities or structures included in management actions are primarily proposed in existing developed areas and would not result in overall reduced scenic quality. Visitor use capacity management would increase, which could increase the potential for ongoing visitor use impacts on natural resources of that could result in secondary effects on scenic resources. Overall, with implementation of MM-VEX-2, as appropriate, (see Appendix C), Alternative 6 would result in local, long-term, minor, beneficial impacts on scenic resources.

## **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The discussion of cumulative impacts on scenic resources is based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with the potential effects of Alternative 6. The projects identified below include those projects that have the potential to affect the scenic resources of the Merced River.

### ***Past, Present and Reasonably Foreseeable Actions***

Past, present and reasonably foreseeable actions that would contribute towards cumulative effects towards scenic resources under this alternative are the same as those listed for Alternative 1.

### ***Overall Cumulative Impact***

Overall development and recreational uses in the Merced River watershed have resulted in localized, long-term, minor to moderate, adverse impacts on scenic resources. A number of past, present, and future projects have beneficially limited uses through planning or restored vegetation and riverbanks and management of vegetation that is blocking scenic views, although the overall impact remains adverse. Alternative 6 would result in local, long-term, minor to moderate, beneficial impacts on scenic resources related to restoration activities throughout the planning area, removal of human-made structures, and reduced visitor use capacity, which result in overall improvement in the scenic quality of the planning area. Cumulatively, the impact on scenic resources would be local, long term, minor, and beneficial.

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## Visitor Experience/Recreation

### *Affected Environment*

Visitors to natural environments may be aware of resource conditions along trails and at recreation sites; however it is somewhat difficult to measuring human perceptions of beneficial or adverse impacts in a National Park. Generally, visitors perceptions of environmental impacts tend to be limited to what they can easily see and different people may have different perceptions based on their prior experience, education with regards to the particular environmental issues and the activities they engage in within any given park location. This section relies on a combination of park staff experience, published literature and public surveys to describe potential impacts to the visitor experience.

### Regulatory Framework

#### *The Wilderness Act of 1964*

The Wilderness Act of 1964 directed the Secretary of the Interior to study federal lands within the national wildlife refuge and national park systems, and recommend to the President those lands suitable for inclusion in a national wilderness preservation system. The Secretary of Agriculture was similarly directed to study and recommend such lands within the national forest system. The act grants Congress the final decision regarding designations. The Wilderness Act defines wilderness as including the following characteristics:

*...wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation. . .*

The Wilderness Act prohibits certain uses in designated wilderness including motor vehicles, motorized equipment, landing of aircraft, other forms of mechanized transport, and structures or installations except as necessary to meet the minimum requirements for the administration of the area for the purpose of the Act.

Segments 1, 5, and 8 are located in designated wilderness areas and are therefore subject to the management provisions of the Wilderness Act. Within Segment 1, the area surrounding the Merced Lake High Sierra Camp is a Potential Wilderness Addition. To the greatest extent possible, a Potential Wilderness Addition is managed as wilderness. This area would become wilderness when current prohibited or inconsistent uses have ceased.

### ***Title 36 of the Code of Federal Regulations***

“The regulations in this chapter provide for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the National Park Service. These regulations would be utilized to fulfill the statutory purposes of units of the National Park System: to conserve scenery, natural and historic objects, and wildlife, and to provide for the enjoyment of those resources in a manner that would leave them unimpaired for the enjoyment of future generations”.

### ***Concessions Management Improvement Act of 1998***

The Concessions Management Improvement Act requires that contracts for visitor facilities and services “be limited to those that are necessary and appropriate for public use and enjoyment” of the national park area in which they are located, “ and that are consistent to the highest practicable degree with the preservation and conservation of the areas.” Title 36 of the Code of Federal Regulations (36 CFR 51) outlines the requirements for the preservation of the parks and administration of commercial service operations. In order to implement the requirements of law, National Park Service has Management Policies. Management policies are guiding principles or procedures that set the framework and provide direction for management decisions.  
(<http://www.nps.gov/policy/DOrders/thingstoknow.htm>)

### ***Superintendent’s Compendium***

The *Superintendent’s Compendium* is a compilation of designations, closures, permit requirements, fees, and other restrictions made by the superintendent, in addition to what is contained in Title 36 of the Code of Federal Regulations and other applicable federal statutes and regulations.

### ***Director’s Order #17: National Park Service Tourism***

The purpose of the Director’s Order #17 calls for “the promotion and support of sustainable, responsible, informed, and managed visitor use through cooperation and coordination with the tourism industry.” This purpose is elaborated upon by Operating Premises and Operational Policies that guide management decisions relating to tourism activities at Yosemite National Park.  
(<http://www.nps.gov/policy/DOrders/thingstoknow.htm>)

### ***Director’s Order #83: Public Health***

Director’s Order #83 outlines measures the NPS will take to ensure compliance with prescribed public health policies, practices, and procedures. This order establishes NPS policy with respect to all public health activities within Yosemite National Park, regardless of whether those activities are carried out by NPS and other federal employees, or by other organizations, including the U.S. Public Health Service. The core policies include prevention, control, and investigation of food-, water-, and vector-borne diseases in the national parks (NPS 2004a).

### ***The National Trails System Act***

The National Trails System Act provides for the ever-increasing outdoor recreation needs of an expanding population. To promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the nation, trails should be established primarily near the urban areas of the nation, and secondarily within scenic areas, such as Yosemite National Park, and along historic travel routes of the nation, which are often more remotely located (NPS 2009).

### ***NPS 2006 Management Policies***

The *2006 Management Policies* state that the purpose of NPS interpretive and educational programs is to advance this mission by providing memorable educational and recreational experiences that will (1) help the public understand the meaning and relevance of park resources, and (2) foster development of a sense of stewardship. The programs do so by forging a connection between park resources, visitors, the community, and the national park system (NPS 2006). Yosemite National Park provides a variety of resources and support staff that allow these programs to advance the public's understanding of the park's qualities.

### **Overview of Visitation and Visitor Demographics**

People travel to Yosemite National Park for a multitude of reasons and their experiences are highly individualized. Some visit the park in the company of friends and family to marvel at its iconic landscape features — its dramatic waterfalls and geologic wonders. Others seek the solitude and primitive nature of the park's wilderness. Some come to study the park's unique and diverse plant and animal life. Others are attracted by its excellent recreational opportunities, including rock climbing and bouldering, cross country skiing, and backcountry hiking and camping. Thus, the continuum of visitor experiences extends from highly social to isolated, from independent to directed, from spontaneous to controlled, from easy to challenging, and from natural to more urban (NPS 2000c). The Merced River plays an important role in shaping these experiences. This section describes the types of visitor facilities and services, including educational and interpretive services, overnight accommodations, and recreational opportunities available throughout the Merced River corridor within the study area, which contribute to the overall visitor experience.

### ***Annual Parkwide Visitation***

Annual park visitation has risen 22% in the last five years, from a 20-year low of 3.24 million visitors in 2006, to 3.95 million in 2011. The record for visitation was set in 1996, when the park received just over four million visitors (NPS 2012a). Park visitation over the last 20 years is shown in **table 9-139**.

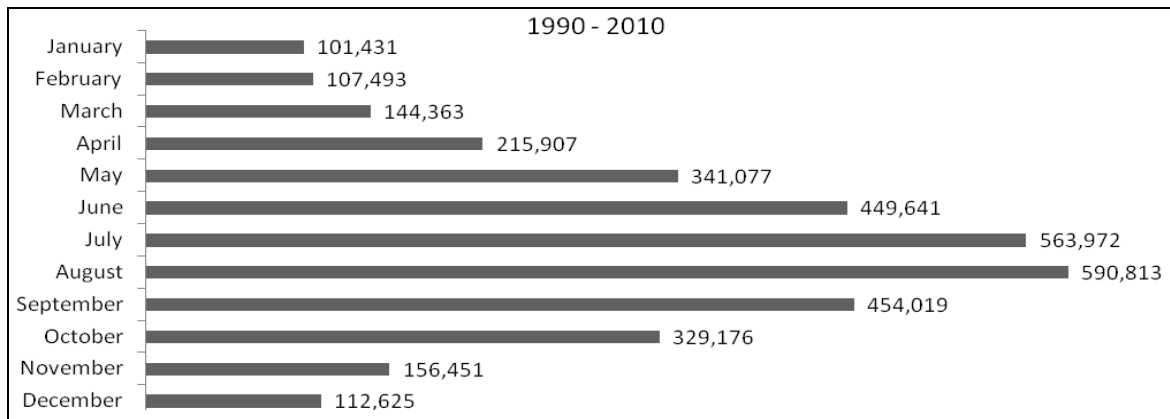
### ***Monthly Parkwide Visitation***

Timing and duration of park visitation varies widely throughout the year. As **figure 9-39** indicates, visitor attendance is highest between the months of May and October. Between 1990 and 2010, August has been the month of highest average visitation, while January has been the lowest.

**TABLE 9-139: ANNUAL VISITATION, YOSEMITE NATIONAL PARK 1990-2011**

Year	Annual Visitation	Year	Annual Visitation
1990	3,124,939	2001	3,368,731
1991	3,423,101	2002	3,361,867
1992	3,819,518	2003	3,378,664
1993	3,839,645	2004	3,280,911
1994	3,962,117	2005	3,304,144
1995	3,958,406	2006	3,242,644
1996	4,046,207	2007	3,503,428
1997	3,669,970	2008	3,431,514
1998	3,657,132	2009	3,737,472
1999	3,493,607	2010	3,901,408
2000	3,400,903	2011	3,951,393

SOURCE: NPS Stats. Accessed via Internet on June 29, 2012 at <http://www.nature.nps.gov/stats/park.cfm>.

**Figure 9-39**  
Average Park Visitation by Month (1990–2010)

These trends vary slightly for 2011 visitation counts; July had the highest visitation count with 704,553 people visiting the park in July, and February the lowest with 93,588 visitors (<http://www.nature.nps.gov/stats/viewReport.cfm>).

#### *Daily Parkwide Visitation*

During July, the month with the highest park visitation in 2011, there were an average of 22,728 daily visitors to the park. During February, the month with the lowest park visitation in 2011, the number of average daily visitors to the park was 3,342 (NPS Stats. 2012).

#### *Visitor Survey Responses*

**Parkwide Visitor Use Survey.** The NPS periodically conducts visitor surveys to help park managers better understand the interests and needs of park visitors. The most recent parkwide survey was

conducted in 2009. The survey looked at visitor origin and destination, reason for visit, duration of visit, activities of interest, and many other topics. Among those surveyed, 36% reported entering the park through the south entrance, while 21% reported entering through the Arch Rock entrance. The majority of those surveyed (57%) reported never having previously visited the park in their lifetime. Overnight visitors (within or near the park) constituted 69% of respondents. Duration of day visits averaged 7.2 hours, while length of stay for overnight visitors averaged 57 hours (2.4 days) (Blotkamp et al. 2009).

The survey also asked visitors about where and how they spent their time while in the park. **table 9-140** lists some of the most commonly identified destinations within the park. As the table indicates, the vast majority of respondents (70%) reported visiting Yosemite Valley generally, with specific destinations in the valley also frequently cited. Respondents named viewing scenery (93%), taking a scenic drive (64%), and day hiking (54%) as common activities within the park. When asked about primary activities in which they engaged, respondents similarly identified viewing scenery (45%), day hiking (27%), and taking a scenic drive (27%). This study indicates that visitor activities are concentrated within the Yosemite Valley and Wawona. (Blotkamp et al. 2010).

**TABLE 9-140: PERCENT OF VISITORS AT COMMON VISITOR DESTINATIONS**

Visitor Destination	Percent of Visitors
Yosemite Valley	70%
Yosemite Falls	59%
Bridalveil Fall	52%
El Captain Meadow	43%
Wawona	33%
Vernal Fall	28%
Half Dome	22%
Indian Cultural Museum	13%
Pioneer Yosemite History Center	12%
Little Yosemite Valley	8%
Yosemite Wilderness	5%
High Sierra Camps	3%
SOURCE: Blotkamp, Ariel et al. 2010. <i>Yosemite National Park Visitor Study</i> . NPS Science Program.	

**River Corridor Visitor Use Survey.** Completed in July of 2012, *Boats, Beaches and Riverbanks: Visitor Evaluations of Recreation on the Merced River in Yosemite Valley* (Whittaker, D., and B. Shelby, 2012) provides the most recent visitor use data. Data from this survey is more relevant to actions proposed for Segment 2 as this survey was specific to Yosemite Valley. The survey was conducted in July 2011 over the course of 15 days with 806 individuals completing the survey. All respondents were Merced River shore or boating users. Shore users included those who were relaxing, picnicking, swimming, hiking, or biking. Key study findings include:

- 56% of respondents were staying in Yosemite Valley.
- 85% were spending two or more days in the park.
- The most common river activities in which participants engaged during this visit were relaxing on shore (76%); swimming (58%); picnicking (48%), and hiking (44%), boating (29%), biking (27%), and fishing (5%).
- Participation in activities among river users in this survey versus parkwide users in the 2009 study differed. River users were more likely to picnic (48% vs. 33%) and bicycle (27% vs. 12%), but less likely to go hiking (44% vs. 54%).

This study also evaluated crowding. Generally, if greater than 80% of respondents report feeling crowded while participating in an activity, the area is considered greatly over capacity. Activities where greater than 80% of visitors reported feeling crowded were all transportation related: driving roads (90%), finding parking (99%), and riding shuttles (83%). If 65% to 80% of respondents report feeling crowded while participating in an activity, the area is considered over capacity. Activities where between 65% and 80% of visitors reported feeling crowded were hiking and biking (68%). Activities where between 35% (low normal) and 65% (high normal) of visitors reported feeling crowded were boating (60%), relaxing (54%), and swimming (45%).

The following sections generally describe the types of visitor facilities and services, overnight lodging accommodations, campgrounds, and recreation activities available throughout the Merced River corridor. This is followed by a description of the specific visitor facilities and services, overnight lodging accommodations, campgrounds, and recreation activities in each river segment.

## **Visitor Facilities and Services Overview**

### ***Commercial Services***

Yosemite offers a variety of commercial visitor services, including lodging, food and beverage, and retail. Among those interviewed for the 2009 visitor use study, 46% reported eating in a park restaurant; 43% shopped in a store other than the Yosemite Valley Visitor Center bookstore; and 34% shopped within the Valley Visitor Center bookstore (Blotkamp et al. 2010). The majority of the park's visitor services are concentrated within Yosemite Valley. Yosemite Village, which is approximately 90 acres, is the core area for most of the development and day use in Yosemite Valley. Visitor facilities and services are also offered at Yosemite Lodge, Curry Village, and The Ahwahnee. Beyond Yosemite Valley, commercial visitor services within the study area are relatively few and exist only in El Portal and Wawona and at the Merced Lake High Sierra Camp.

### ***Trails***

Trails and trail types within the study area range from easy to strenuous and short to long, and can be either paved or unpaved. There are 78 miles of trails within the study area — approximately 30 miles within the designated wilderness and 48 miles in non-wilderness areas.

Although no restrictions have been established for day hiking in the wilderness with the exception of hiking to Half Dome, which requires a separate permit, permits are required for overnight stays in the wilderness. Wilderness permits are issued to a limited number of people for each trailhead in order that visitors may experience solitude associated with the wilderness. Sixty percent of the permits can be reserved ahead of time and 40% are available on a first-come, first-served basis the day before departure. Wilderness permits are issued to groups of hikers. Groups are limited to 15 per group when traveling on established trails and eight per group when traveling off-trail more than 0.25 mile. Groups traveling with stock are limited to 25 head of pack and saddle stock per party (NPS 1999b).

### ***Stock Use***

Pack stock (horses, mules, burros and llamas) use in Yosemite National Park falls into three categories: commercial, administrative, and private. Parkwide, commercial trips account for approximately 50% of stock use parkwide and are booked through the park concessioner or pack stock operations located outside the park. Administrative stock use accounts for approximately 45% of stock use parkwide with park employees using stock to “clear trails, support trail crew camps, maintain composting toilets, perform research, perform resource management activities, conduct backcountry search and rescue activities, and conduct backcountry ranger patrols.” The remaining 5% of stock use is private. (Acree et al. 2010). In 2010, within the Merced River Corridor, 383 stock nights (overnight trips where stock was used) were recorded (83 commercial and 300 administrative).

There are two commercial stables in the study area — the Yosemite Valley stable and the Wawona stable. Guided stock rides are available from both stables and in 2012, rides of either two-hours or a half-day in duration were available. Guided pack and saddle trips are also available for longer visits to the wilderness and take visitors to one or more of the High Sierra Camps. The number and duration of rides varies from year to year as determined by park administration and is dependent upon trail conditions and visitation. Therefore, the actual number of days that the stables are open varies from year to year. In 2011, a total of 14,400 stock day trips (defined as one person/one horse) were taken from these two stables:

- |                          |                  |
|--------------------------|------------------|
| • Yosemite Valley stable | • Wawona stable  |
| – 2 hour = 11,250        | – 2 hour = 1500  |
| – half day = 1,500       | – half day = 100 |
|                          | – full day = 50  |

Title 36 of the Code of Federal Regulations and the Superintendent’s Compendium regulate stock use within Yosemite National Park. The use of horses or pack animals is permitted on all unpaved foot trails in Yosemite Valley and in Wawona on the Wawona Meadow Loop Road, Four-Mile Road, and Eleven-Mile Road. Bicycle paths, tram roads, shuttle bus routes, and the Mirror Lake Road are specifically closed to stock use except for administrative activities. Stock use is also permitted on all park trails except the Mist Trail from Happy Isles to Nevada Falls and the Lower Chilnualna Falls Foot Trail in Wawona.

Wilderness overnight stock parties on designated trails are limited to 25 head of stock and 15 people. Wilderness overnight stock parties using authorized, non-maintained stock routes are limited to



12 head of stock and eight people. The maximum number of stock for parties not spending nights in the wilderness is 25 head of stock on designated trails and 12 head on other authorized stock routes.

Loose herding and grazing is prohibited in front-country areas, and established front-country campsites must be cleaned daily (i.e., manure and uneaten fodder removed). Watering facilities must be used when provided.

### ***Interpretation and Education Services***

A heritage of stewardship is perpetuated through opportunities for education and interpretation of the Merced River and its unique values. These opportunities represent a proactive approach to protecting the river from human impacts. Park interpreters and volunteers serve a primary natural and cultural resource preservation role in the park. Interpreters connect people to the meaning and significance of the park by conveying information and educational programs to visitors and park employees about the history and function of park ecosystems and the relationship between various park resources. Interpretive and educational services include educational/school programs; field seminars; evening programs and ranger-led walks; valley-floor tram tours; audio-visual presentations at park visitor centers; interpretive wayside exhibits; cultural history museums; park open houses (primarily a tool to provide information about park planning projects); and published materials available at entrance stations, visitor centers, and campground and lodging registration desks. Most publications, as well as Web-based and social interpretive media, address values in Segments 1–8, while on-site programs and products are focused within three segments of the river: Yosemite Valley, Merced River Gorge, and Wawona.

**Information and Materials.** The NPS provides visitors with published information regarding Yosemite National Park in many different formats. These include Yosemite National Park's Web site, official park mailings, and e-newsletter updates. Information is also distributed at entrance stations and visitor centers and includes the free *Yosemite Guide* newspaper (published eight times a year), a free park brochure/map, handouts on self-guided nature trails, and supplemental education materials and fact sheets. (Portions of the *Yosemite Guide* are translated into German, French, Spanish, Italian, Chinese, and Japanese.) Information includes travel and directions to the park; important information for planning visits (e.g., seasonal weather conditions and road closures); activities and special events in the park; lodging and campground reservation information; information on park planning projects; and a variety of maps and graphics to provide orientation to the park's roads, features, facilities, services, and trails. It also serves as a primer on Yosemite's natural and cultural history and scenic beauty.

Park staff offer a wide range of media (e.g., the orientation audio-visual program at the Yosemite Valley Visitor Center) and interpretive programs to assist visitors in understanding the park's natural and cultural resources. The park's primary concessioner also provides information on lodging and other visitor services on their Web site, as well as interpretive programs at guest lodges and the High Sierra Camps. In addition, park partners, such as the Yosemite Conservancy and NatureBridge, collaborate with the NPS to provide evening programs and information about park events and natural history.

**Facilities.** Yosemite Village and Wawona each have a visitor center and a wilderness center. In Wawona, these functions are combined at the Wawona Visitor Center at Hill's Studio. The Yosemite Valley Wilderness Center, the Nature Center at Happy Isles, and the Wawona Visitor Center are open

seasonally during the summer. The Yosemite Valley Visitor Center is open year-round to provide visitors with wilderness trip planning information as well as permits during the winter when the Yosemite Valley Wilderness Center is closed. Additional information on park facilities, visitor services, and wilderness trip planning is available at the seasonal information and permit station at Big Oak Flat and from registration staff at campgrounds and lodging facilities. Commercial bus operators also provide orientation and information to visitors transported to and from the park. Visitors can also gain information from self-guided brochures and interpretive wayside exhibits throughout the park.

**Programs.** A wide range of interpretive programs and materials are available to the public (see **table 9-141**). Programs are offered by several entities and cover a wide variety of topics, including geology, astronomy, botany, wildlife, trees, hydrology, cultural history (American Indian, Buffalo Soldiers, settlements, and modes of transportation), Junior Ranger programs, wilderness, fire, rock climbing, and bouldering. Programs range in duration from less than 1 hour to all-day hikes and multi-day seminars and residential field science experiences. Interpretive hikes venturing into the Yosemite Wilderness aim to support wilderness management by increasing visitor understanding of park resources and management concerns.

### **Overnight Lodging Accommodations**

There are 1,160 units of overnight lodging available in the Merced River corridor at six concessioner-operated facilities: Yosemite Lodge, Housekeeping Camp, Curry Village, The Ahwahnee, the Wawona Hotel, and the Merced Lake High Sierra Camp. Facilities range from rustic tent cabins to deluxe hotel rooms and cabins. In addition, private lodging accommodations available within the corridor consist of the Yosemite View Lodge in El Portal and many independently owned, small-scale operations in Wawona.

The 2009 visitor use survey, described previously, found that 58% of visitors who stayed overnight within the park stayed in lodging (Blotkamp et al. 2010). During the summer, occupancy at lodging units in Yosemite Valley is very high.

### ***Camping Areas***

There are nine designated camping areas within the Merced River Corridor, providing 565 campsites in Yosemite Valley and Wawona and three designated camping areas in the Yosemite Wilderness. Some of these areas offer facilities, such as restrooms with flush toilets, running water, trash, and recycling collection. Others are more primitive, offering only compost toilets and food storage lockers. Camping areas within the main stem and South Fork Merced River corridor exist in the wilderness area above Nevada Fall (Segment 1), in Yosemite Valley (Segment 2), and Wawona (Segment 7). There are no designated camping areas in the Merced River gorge or El Portal (Segments 3 and 4) or in the South Fork Merced River corridor, outside of Wawona (Segments 5, 6, and 8). The 2009 visitor use survey, described previously, found that among visitors who stayed overnight within the park, 31% tent camped in a developed camping area, while 11% stayed at a backcountry campsite (Blotkamp et al. 2010). During the summer, campgrounds are usually 100% occupied on weekends and on many weekdays.

**TABLE 9-141: INTERPRETIVE AND EDUCATIONAL SERVICES IN THE RIVER CORRIDOR**

Organization	Yosemite Valley	Yosemite Wilderness	Wawona/El Portal
National Park Service	<ul style="list-style-type: none"> <li>• Ranger-led walks, talks</li> <li>• Self-guided nature trails</li> <li>• Interpretive performances, slideshows, audio-visual programs</li> <li>• Interpretive wayside exhibits</li> <li>• Nature Center at Happy Isles</li> <li>• Museum, visitor center, and trail exhibits</li> <li>• Research library</li> <li>• Indian Village of Ahwahnee</li> <li>• Indian Cultural Center (planned)</li> <li>• History — Yosemite Cemetery</li> <li>• Interpretive publications</li> <li>• Evening programs</li> <li>• Open-air tram tours</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-day ranger-guided High Sierra Camp loop trips that include a stop at the Merced Lake High Sierra Camp</li> <li>• Evening programs</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Living Program</li> <li>• Stage Coach Living History Program</li> <li>• Ranger-led walks, talks</li> <li>• Wawona Campground</li> <li>• Pioneer Yosemite History Center</li> <li>• Evening programs (EP)</li> <li>• Wawona Visitor Center</li> </ul>
Delaware North Companies Parks and Resorts at Yosemite	<ul style="list-style-type: none"> <li>• Rock climbing classes (Yosemite Mountain School).</li> <li>• Interpretive performances (Ranger Ned)</li> <li>• Interpretive talks, slideshows, audiovisual programs</li> <li>• Guided hikes</li> <li>• Bus tours</li> <li>• Open air tram tours</li> </ul>	<ul style="list-style-type: none"> <li>• Guided wilderness trips</li> </ul>	<ul style="list-style-type: none"> <li>• Interpretive talks, slideshows, audiovisual programs</li> </ul>
Yosemite Conservancy	<ul style="list-style-type: none"> <li>• Interpretive publications</li> <li>• Art classes and educational seminars</li> <li>• Yosemite Theater presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Educational seminars</li> <li>• Scientific research and habitat restoration</li> </ul>	<ul style="list-style-type: none"> <li>• Educational seminars</li> </ul>
NatureBridge	<ul style="list-style-type: none"> <li>• Educational field-science programs for school-age children and adult groups</li> </ul>	<ul style="list-style-type: none"> <li>• Guided wilderness trips</li> </ul>	NA
Sierra Club	<ul style="list-style-type: none"> <li>• Interpretive walks and talks</li> <li>• LeConte Memorial Lodge exhibits and library</li> <li>• Interpretive exhibits</li> <li>• Library</li> </ul>	<ul style="list-style-type: none"> <li>• Guided wilderness trips</li> </ul>	NA
The Ansel Adams Gallery	<ul style="list-style-type: none"> <li>• Art exhibits</li> <li>• Photo walks and classes</li> <li>• Film presentation</li> </ul>	NA	NA

SOURCE: Merced Wild and Scenic River Plan: Preliminary Alternative Concepts Summary Comparison Table. March 2012

## Recreational Activities

The Merced River and South Fork Merced River offer diverse, river-related recreational opportunities. The experience of recreating in these areas is inextricably linked to the river's dynamic natural processes, which have helped form and continue to influence the scenery and evocative landscape. In this setting, visitors are able to experience nature on a grand scale, one in which the river is paramount. Within these surroundings, people of all ages and abilities enjoy exemplary experiences that often create personal memories, traditions, and multi-generational bonding among family and friends. A few such activities include hiking, kayaking, swimming, and fishing. The availability of these opportunities varies by location within the Merced River and South Fork Merced River corridors. A summary of recreational activities within the various segments of the corridor is provided in table 9-142.

**TABLE 9-142: RECREATIONAL ACTIVITIES WITHIN THE MERCED RIVER CORRIDOR**

River	Park Area	Recreational Opportunities
<b>Merced River</b>	Wilderness (Segment 1)	Backpacking/hiking, camping, High Sierra Camp experience, stock use, fishing, swimming/wading, nature study, photography, cross-country skiing, snowshoeing
	Yosemite Valley (Segment 2)	Walking/hiking, picnicking, camping, rock climbing and bouldering, cross-country skiing, snowshoeing, ice skating, fishing, photography, swimming/wading, floating, nature study, stock use, sightseeing, rafting, kayaking, interpretive programs, bicycling, art classes
	Merced River Gorge (Segment 3)	Rock climbing and bouldering, fishing, swimming/wading, photography, sightseeing, nature study
	El Portal (Segment 4)	Whitewater rafting/kayaking, fishing, swimming/wading
<b>South Fork Merced River</b>	Wilderness (Segments 5, 6)	Backpacking/hiking, camping, stock use, fishing, swimming/wading, nature study, photography, sightseeing, cross-country skiing, snowshoeing,
	Wawona (Segment 7)	Hiking, picnicking, camping, cross-country skiing, snowshoeing, fishing, photography, swimming/wading, floating, nature study, stock use, sightseeing, rafting, interpretive programs, golfing
	Wilderness Below Wawona (Segment 8)	Hiking, fishing, whitewater kayaking

### Segment 1: Merced River Above Nevada Fall

#### *Visitor Facilities and Services*

**Commercial Services.** Commercial services in Segment 1 are minimal and consist of the Merced Lake High Sierra Camp (see description under Overnight Lodging Accommodations) and commercial guided multi-day pack trips.

**Trails.** There are nearly 800 miles of marked and maintained trails providing access to and throughout the Yosemite Wilderness. Within the Merced River corridor, there are approximately 30 miles of

wilderness trails. The most heavily used wilderness trails are those above Nevada Fall (Segment 1). Primary access to this area is provided by the Mist and John Muir trails, which originate in Yosemite Valley. The Yosemite Falls Trail and the Four Mile Trail originate in the valley and lead to wilderness areas beyond the corridor.

**Interpretation and Education.** Interpretive and educational activities in Segment 1 occur at the Merced Lake High Sierra Camp and include ranger-led day walks and evening programs. There are also multi-day ranger-guided High Sierra Camp loop trips that include a stop at the Merced Lake High Sierra Camp.

### *Overnight Lodging Accommodations*

**Merced Lake High Sierra Camp.** This is the largest and most remote (in terms of distance from trailhead) of the five High Sierra Camps in Yosemite. It is located on the east end of Merced Lake at 7,150 feet above sea level and can accommodate up to 60 overnight guests. Most visitors arrive on foot, but some arrive via stock from other High Sierra Camps. The camp includes 22 tents, each of which can accommodate two to four people. Two of these tents are used to house employees, and one is set aside for wranglers traveling with stock. Showers and flush toilets are available, and a dining hall accommodates 70 people. The camp also serves meals to through-hiking backpackers. Helicopters are used to transport items that are too big to safely transport with stock, responses to medical emergencies, and to facilitate transport and disposal of solids from the camp's septic system. All refuse is packed out by stock. Occupancy rates at the Merced Lake High Sierra Camp during a typical season are high.

### *Camping*

There are three separate designated wilderness camping areas within the Merced River corridor above Nevada Fall: Little Yosemite Valley, Moraine Dome, and Merced Lake Backpacker's camping areas. These designated camping areas are popular wilderness camping destinations within the park and are heavily used during the summer months (NPS 2011e). In addition to these designated areas, campers may also engage in dispersed camping at wilderness locations with some restrictions.

There is no limit on the number of campers at any of the designated camping areas and no specific number of campers that they can accommodate. The number of permits for wilderness camping is controlled by an overnight quota system, but the individual number of campers on a given night is subject to the travel choices of each individual group, which is only partially regulated by the wilderness permit.

**Little Yosemite Valley Backpacker's Camping Area.** This is the western-most camping area within the Merced River corridor above Nevada Fall. This location can accommodate approximately 125 overnight campers. Facilities include one composting toilet, two fire rings, 21 bear-proof boxes for food storage, and informational signage. Use of this area during the summer months (i.e., between Memorial Day and Labor Day weekends) is generally heavy.

**Moraine Dome Camping Area.** Also in Little Yosemite Valley, this smaller, undeveloped backpacker camping area is located just east of the Little Yosemite camping area. This location can accommodate approximately 50 overnight campers and offers no facilities.

**Merced Lake Backpackers Camping Area.** This location is located further upstream, along the eastern shore of Merced Lake, near the Merced Lake High Sierra Camp. This area can accommodate approximately 90 overnight campers. Facilities include potable water, flush toilets, fire rings, and approximately eight bear boxes. As with those discussed previously, these campsites tend to be heavily used during the summer months.

### ***Recreational Activities***

**Fishing.** The headwater areas of both the Merced River and South Fork Merced River have mountain ponds and alpine lakes, as well as snowmelt and ephemeral streams, within their boundaries. Fishing in the wilderness lakes is a popular activity for visitors, particularly at Merced Lake High Sierra Camp, where fishing takes place in Washburn and Merced lakes. Wilderness lakes support nonnative brown and rainbow trout populations.

**Swimming.** In the wilderness, swimming occurs in certain reaches of the Merced River, downstream from various cascades, including Bunnell Cascade. Swimming also takes place near Moraine Dome and in the many lakes in the upper Merced River corridor, particularly in Merced Lake and Washburn Lake.

**Hiking.** Climbing Half Dome is a popular wilderness hike. Ranging from 14 to 16 miles in length depending on the route, this hike involves scaling the backside of the dome with cables and requires a permit. The current permit system allows 400 total hikers per day — 300 day visitors and 100 overnight visitors. Permits are distributed via a lottery both at the beginning of the season and on a daily basis. An environmental assessment is currently being prepared for Half Dome and will refine permit regulations.

**Stock Use.** Visitors participate in commercial overnight stock trips to the wilderness originating from various points both inside and outside of the park. More information on stock use and stock trails can be found in the “Visitor Facilities and Services Overview” section, above.

**Other Activities in the Merced River Corridor.** Visitors participate in other activities along the river that may not be specifically related to or dependent on the river. These include rock climbing and bouldering. The experiences of visitors engaged in these activities may be enhanced by the river, but the river and its values are not the primary focus of these experiences.

## **Segment 2: Yosemite Valley**

### ***Visitor Facilities and Services***

**Commercial Services.** Yosemite Valley offers the broadest range of visitor facilities and services within the river corridor. Commercial services include: food and beverage, retail, lodging, and recreation rentals. Additional non-commercial services include museums, galleries, and educational and interpretive facilities. In Yosemite Valley, visitor facilities and services are located in five distinct locations — Yosemite Village, Yosemite Lodge complex, Curry Village, The Ahwahnee, and Housekeeping Camp. **Table 9-143** below summarizes the visitor facilities and services in each location. Each location also provides overnight accommodations.

**TABLE 9-143: VISITOR FACILITIES AND SERVICES BY LOCATION AND TYPE**

Location	General Use	Specific Facilities and Services
Yosemite Village	Retail Services	Degnan's Delicatessen and gift shop, Village Store complex (gift/grocery, fast food and specialty retail), Ansel Adams Gallery
	Visitor Services	Main Yosemite National Park U.S. Post Office, ATM and check cashing facility, concessioner garage (open to visitors), medical and dental clinic, tour kiosk, recycling center
	Interpretation/Education	Visitor Center, Yosemite Museum and Research Library, Wilderness Center, Yosemite Art Center
Curry Village	Retail Services	Dining pavilion, fast food outlets, a gift/grocery store, specialty retail
	Visitor Services	Ice rink, raft and bicycle rentals, swimming pool, tour kiosk, NPS Campground Reservation Center, recycling services
	Interpretation/Education	Mountaineering school, outdoor amphitheater
Yosemite Lodge	Retail Services	Restaurant, a food court, fast food outlet, bar, a gift/grocery store, and specialty retail store,
	Visitor Services	Post office, bike rental, pool, tour desk
	Interpretation/Education	Outdoor amphitheater, indoor evening program space, two meeting rooms
Housekeeping Camp	Retail Services	Camp Store
	Visitor Services	Laundry, Showers
	Interpretation/Education	
The Ahwahnee	Retail Services	Dining room, bar and lounge, two gift shops
	Visitor Services	Swimming pool
	Interpretation/Education	Concessioner tours

**Trails.** There are over 46 miles of trails in Yosemite Valley, including approximately 7 miles of paved bike paths, 0.75 mile of boardwalks, and almost 10 miles of informal trails. The length of the trails in Yosemite Valley is illustrated in **table 9-144**.

**Interpretive and Educational Services.** Yosemite Valley provides numerous, diverse interpretive and education programs. At least 77 outdoor wayside exhibits reveal meaningful stories related to biology, hydrology, geology, scenery, and recreation. At least 10 different interpretive walks travel into the Merced River corridor, helping visitors gain a deeper understanding of river values. Six different curriculum-based education programs expose students to the same, as well as summer daily offerings of Junior Ranger programs. DNC Interpretation, Sierra Club at Le Conte Memorial Lodge, Yosemite Conservancy, and other partners also share river stories and resource protection messages with visitors to Yosemite Valley. Campfire programs are offered on multiple topics, some river related. Programming aims to meet the goals outlined in the park's *Long Range Interpretive Plan*, and is usually modified annually to match current trends in visitation and park operational capacity. Several venues provide space for interpretive and educational programming.



**TABLE 9-144: YOSEMITE VALLEY TRAIL LENGTHS AND LEVEL OF DIFFICULTY**

Trail Name	Length	Difficulty
Bridalveil Fall	0.5 mile round-trip (RT)	Easy
Lower Yosemite Fall	1.1 miles (RT)	Easy
Cook's Meadow Loop	1 mile (RT)	Easy
Mirror Lake/Meadow	2 miles (RT)	Easy
Valley Floor Loop	13 miles (RT)	Moderate
Four Mile Trail	9.6 miles (RT)	Strenuous
Panorama Trail via Mist Trail	8.5 miles one-way	Strenuous
Upper Yosemite Fall	7.2 miles (RT)	Strenuous
Vernal and Nevada falls	Footbridge: 1.6 miles (RT) Vernal Fall: 2.4 miles (RT) Nevada Fall: 5.4 miles (RT)	Strenuous
Half Dome (permit required)	via Mist Trail: 14 miles (RT) via John Muir Trail: 16.3 miles(RT) via Mist and John Muir Trails: 15.2 miles (RT)	Strenuous

- The Nature Center at Happy Isles currently sits on the historic site of the California State Fish Hatchery built by the Fish and Game Commission in 1927. The building houses wildlife dioramas, tracking tips, interactive exhibits, and four different environments including riverine. The Nature Center has been used as a hub for extensive Jr. Ranger Programs, including one- and two-hour Jr. Ranger walks and Jr. Ranger Campfires located 0.25 mile from the center at the A-frame campfire ring.
- Yosemite Valley Visitor Center was built in 1966 as part of the Service-wide Mission 66 initiative. The interior of the one-story visitor center contains updated exhibits created in 2007. Exiting the rear doors of the visitor center, one enters an open courtyard that leads to the theater where a 20-minute film, *Spirit of Yosemite*, is shown throughout the day.
- Yosemite Museum was completed in 1925, designed by architect Herbert Maier in the newly emerging National Park Service Rustic Style. It opened to the public in May of 1926 as the first building constructed as a museum within the NPS. The first floor of the building houses exhibits that are open to the public. Adjacent to the museum gift store is a small collection room that is used by NPS curatorial staff and is an area where tours are given by request. The Yosemite Museum is staffed by NPS Indian Cultural Demonstrators who demonstrate a variety of traditional skills, including basket making and preparation, acorn preparation, beading, jewelry making, string making, and flint knapping.
- Outside the back doors of the Yosemite Museum and the Valley Visitor Center, to the north, is the Indian Village of Ahwahnee. Here visitors follow a self-guided experience through the reconstructed Indian Village by way of wayside exhibits and a brochure.
- Lower Pines Campground Amphitheater is the only outdoor amphitheater located in an existing Yosemite Valley campground. Evening ranger programs are offered during summer.
- Lower River Campground Amphitheater is an outdoor amphitheater located in Yosemite Valley at the former Lower Rivers Campground. This amphitheater is used infrequently.

- LeConte Memorial Lodge, designated a National Historic Landmark in 1987, was built by the Sierra Club in 1903. LeConte Memorial Lodge is open to the public in summer and contains a library of relevant titles. Evening programs, offered Friday through Sunday, focus on natural science, and specifically the history and science of Yosemite Valley.
- NatureBridge is a primary park partner that provides curriculum-based educational programming for grades 6–12 in Yosemite National Park. Many of their programs take place in the Merced River corridor and highlight the significance of outstandingly remarkable values of the river.
- Overnight Lodging Accommodations. Lodging options available within this segment are summarized below.

**Yosemite Lodge.** Near the base of Yosemite Falls, this lodge encompasses an area of about 40 acres, and offers 245 lodge and family rooms (DNC 2011a), as well as the visitor services and facilities described in the previous section. Pine and Oak Cottages, as well as cabins with and without baths that were damaged by the January 1997 flood, have been removed.

**Housekeeping Camp.** Currently 266 units are available for use by visitors at Housekeeping Camp (DNC 2011a). Each unit (one half of a duplex structure) can accommodate six people, with a total of 12 people per structure. Food preparation is allowed in Housekeeping Camp, thereby increasing its popularity with visitors. As noted in the “Hydrology” section of this chapter, several of the Housekeeping Camp units are located within the 10-year floodplain and subject to inundation (NPS 2011e).

**Curry Village.** The Historic District at Curry Village, about 50 acres, offers a total of 400 units, including cabins with and without private baths, tent cabins, and rooms in Stoneman Lodge (DNC 2011a). Visitor services and facilities are described in the previous section. As noted in the Geology section of this chapter, 72 Curry Village units were destroyed or removed from service following the 2008 rock fall (<http://parkplanning.nps.gov/projectHome.cfm?projectId=29566>).

**The Ahwahnee.** The Ahwahnee, a 12-acre National Historic Landmark, offers 123 rooms and cottages. Of these, 99 are currently deluxe hotel rooms and 24 are cottage rooms.

### *Campgrounds*

There are five public campgrounds within Yosemite Valley: Upper Pines, Lower Pines, North Pines, Camp 4, and Backpackers. Following the 1997 flood and related infrastructure damage, 124 sites were removed at the former Upper River Campground and 138 sites were removed at the former Lower River campground. Campground availability in the Yosemite Valley is extremely limited during peak summer months, with most campgrounds operating at or near capacity during this period. In addition, as noted in the “Hydrology,” “Vegetation,” and “Wetlands” sections of this chapter, heavy use at campgrounds near the Merced River has given rise to an expansion of social trails across meadows, vegetation trampling, and streambank erosion (NPS 2011e).

**Upper Pines Campground.** Located in east Yosemite Valley, Upper Pines Campground has 240 total sites. On average, 4.5 people occupy each site and stay for an average of 2.7 nights (NPS 2011 d, e). The

10 restrooms in the campground (NPS 2011f) are connected to the Yosemite Valley sewer collection system. An RV dump station is located at the entrance to Upper Pines Campground.

**Lower Pines Campground.** Located in the east Valley to the west of Upper Pines Campground, Lower Pines Campground has 76 total sites. On average, 4.66 people occupy each site and stay for an average of 2.71 nights (Bryan 2011b, 2011e). The three restrooms in the campground (NPS 2011f) are connected to the Yosemite Valley sewer collection system. Lower Pines Campground has an amphitheater for ranger-led programs.

**North Pines Campground.** Located in the east Valley, to the north of Lower Pines across the Merced River, North Pines Campground has 86 total sites. On average, 4.2 people occupy per site and stay for an average of 2.71 nights. There are 23 RV-only sites at this campground (Bryan 2011b). The four restrooms in the campground (NPS 2011f) are connected to the Yosemite Valley sewer collection system.

**Camp 4.** Located north of Yosemite Lodge, Camp 4 has 35 sites (Bryan 2011b) which are available on a first-come, first-served basis. There is one restroom facility in the campground, which is connected to the Yosemite Valley sewer collection system. Camp 4 is listed on the National Register of Historic Places because of its nationally significant role in the development of rock climbing as a sport (NPS 2011f).

**Backpackers Campground.** Located to the north of North Pines Campground across Tenaya Creek, Backpackers Campground has 25 sites. Backpackers Campground allows only campers with wilderness permits. They may stay either the day before their departure into the Yosemite Wilderness or the evening of their return from the Wilderness. This campground has five vault toilets that are not connected to the Yosemite Valley sewer collection system, and no potable water (NPS 2011f).

### ***Recreational Activities***

**Fishing.** In the stretches of the Merced River that flow through the Yosemite Valley, brown trout, rainbow trout, brook trout, and smallmouth bass are commonly sought by visiting anglers. Fishing in Yosemite National Park is regulated under state and federal (NPS) fishing regulations prohibiting the use of live bait and barbed hooks. The area between Happy Isles to Foresta Bridge is designated as catch-and-release waters for rainbow trout.

**Swimming.** Swimming and wading in the Merced River corridor is popular during the summer. In a 2012 study of river visitors in Yosemite Valley, 58% reported participating in swimming during their visit (Whittaker, et al. 2012). The NPS does not officially designate swimming areas except those areas closed to swimming and bathing — Emerald Pool and the Silver Apron above Vernal Fall.

The park encourages visitors to avoid fast-moving water and unsafe pools above waterfalls. In the valley, swimming is a popular activity in the Merced River, Tenaya Creek, and at Mirror Lake. Most sections of the river in Yosemite Valley are within easy access from lodging areas, roads, campgrounds, and day use areas. Many of these areas are heavily used, particularly where they are adjacent to developed campgrounds and upstream or downstream of certain bridges, such as Stoneman and

Swinging bridges. Two public pools at Yosemite Lodge and Curry Village are used during the summer months. There is a year-round guest pool at The Ahwahnee.

**Rafting and Kayaking.** Visitors can rent rafts from the primary concessioner at Curry Village if water levels are sufficient. Rafting has been popular in the valley since the 1980s, and all rafting is self-guided. The concessioner is permitted to have 100 rental rafts on the river at any time when the water level and air temperature are within guidelines established by the Superintendent to protect visitor safety. The number of operating days varies on a yearly basis due to these factors. Visitors also use various personal rafts and flotation devices throughout the Merced River corridor. Motorized boating on the Merced River is prohibited.

All operational aspects of the raft rental system are controlled by the NPS pursuant to the terms of the *Concession Contract Operating Plan* and related direction to the concessioner provided by formal correspondence and periodic operational performance evaluations conducted by NPS staff. Per the Concession Contract, the concessioner may not exceed 100 rafts on the river at one time.

Rafting regulations have been implemented to protect river habitat and provide for visitor safety in the valley. In general, park management encourages visitors to launch and remove rafts at sandbars and beach locations. The concessioner must use designated areas for launching and removal of nonmotorized watercraft. Nonmotorized vessels are allowed on the section from Stoneman Bridge to Sentinel Picnic Area during the hours of 10:00 a.m. to 6:00 p.m. There is a raft launch site on the downstream side of Stoneman Bridge, where the river typically has slow-moving water during the summer. Concessioner nonmotorized watercraft is not permitted past the Sentinel Beach Picnic Area. Areas around launch sites can become denuded of vegetation due to heavy use, causing bank erosion and sedimentation (NPS 2011e).

**Picnicking.** Yosemite Valley visitors can choose from six designated picnic areas and facilities, including the Church Bowl Picnic Area near Ahwahnee Meadow, the Lower Yosemite Fall Picnic Area, the Swinging Bridge Picnic Area, the Sentinel Beach Picnic Area, the El Capitan Picnic Area, and the Cathedral Beach Picnic Area. These picnic areas offer picnic tables, vault toilets, and garbage and recycling receptacles. With the exception of the Lower Yosemite Fall and Church Bowl picnic areas, each has a grill. None has potable water. Visitor use is generally heavy at these picnic areas, often exceeding the capacity of the picnic area infrastructure during peak summer months.

**Hiking.** Visitors have access to Yosemite Valley trails that range from a short stroll to the base of Lower Yosemite Fall to an ambitious 14- to 16-mile round-trip day hike to the top of Half Dome. Thirty-five miles of hiking trails are available on the Yosemite Valley floor. Many of these closely parallel the Merced River, providing access to and views of the river along the way. Some of these trails are shared with bicyclists and/or stock users. Several walking loops are available in East Yosemite Valley, and there are two loops in West Yosemite Valley: (1) between Swinging Bridge and El Capitan Bridge, and (2) between El Capitan Bridge and Pohono Bridge. Day hikers can circumnavigate the valley using the Valley Loop Trail, which is shared by stock. A trail network provides multiple routes between the Happy Isles/Mirror Lake area and Yosemite Village. Self-guiding interpretive trails can be found at Mirror Lake and in the Indian Village of Ahwahnee behind the Yosemite Valley Visitor Center. A multi-use paved trail (shared by pedestrians and bicyclists) links Yosemite Lodge to the

Happy Isles area on both sides of the Merced River. Paved trails (multi-use trails and roads closed to private vehicles) in the valley are approved for use by visitors with pets. Heavy and multiple uses often create congestion on paved trails, especially in Yosemite Village. Several trails have wayside exhibits to interpret features encountered along the way. The Mist Trail is one of the most popular short hikes in Yosemite National Park. It follows the Merced River, starting at Happy Isles in Yosemite Valley, past Vernal Fall, Emerald Pool, to Nevada Fall. Along the trail, the Merced River is a tumultuous mountain stream, lying in a U-shaped valley. Enormous boulders are dwarfed by the sheer granite rock faces, which rise to 3,000 feet above the river. Through it all, the Merced River rushes down from its source in the high Sierra, broadening as it crosses the floor of Yosemite Valley.

**Stock Use.** Day rides on mule and horseback and overnight trips to the wilderness all originate in the Yosemite Valley stables in Curry Village. More information on stock use and stock trails can be found in the “Visitor Facilities and Services Overview” section above.

#### *Other Activities in the River Corridor*

**Biking.** Bikers can bring their own bicycles or rent them. There are two bike rental stands in Yosemite Valley, one at Curry Village and the other at Yosemite Lodge. This is a popular activity and rentals include bikes and trailers for children as well as accessible transportation rentals such as wheelchairs, electric mobility scooters, hand crank bicycles (recumbent bicycles), and tandem bicycles. Bicycle rentals vary from day to day and year to year, depending on opening/closing dates, weather, and overall visitation.

**Winter Activities.** Many activities are available to park visitors during the winter months, including cross-country skiing, tubing/sledding, ice skating, and snowshoeing. Most cross-country ski routes follow summer trails or traverse the open meadows. At elevations of 4,000 feet, Yosemite Valley sometimes has snow for long periods; however, snow at lower elevations, such as in El Portal, is rare. Ice skating is available at a concessioner-operated rink at Curry Village and is used in the winter by both visitors and residents. Yosemite Valley serves as a primary lodging center for visitors pursuing winter recreation.

**Other Activities.** Visitors participate in other activities along the river that may not be specifically related to or dependent on the river. Among these are rock climbing and bouldering, and classes offered by the Yosemite Mountaineering School, the Art Activity Center, the Yosemite Conservancy, and the Ansel Adams Gallery.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### *Visitor Facilities and Services*

**Commercial Services.** Commercial services in El Portal include a small grocery store and a gas station. Additional facilities and services include the El Portal post office, a community center, and a community park. Other services are provided on private land.

**Trails.** There are no hiking trails in Segments 3 and 4.

**Interpretation and Education.** The interpretation and education opportunities in the Merced River Canyon are currently limited to wayside exhibits. Currently, four outdoor wayside exhibits explain natural processes related to biology, hydrology, geology, scenery, and recreation.

### *Recreational Activities*

**Fishing.** The Merced River between the park boundary and the Forest Road Bridge, also known as El Portal reach, has been designated as a Wild Trout Fishery by the California Department of Fish and Game because of the favorable growing season and conditions of the river in this stretch (CDFG 2004). The popularity of angling is growing in the El Portal reach due to these favorable fishing conditions. Because anglers typically work the river as they walk upstream, there are only a few well-known fishing areas, including west of the wastewater treatment plant in El Portal, the Sand Pit, near the Highway 140 Bridge, across the road from El Portal Market, and near the confluence with Crane Creek. The California Department of Fish and Game continues to stock trout species in the Merced River just below the Foresta Road Bridge; these fish populations move upstream and have the potential to travel as far as Yosemite Valley (Stevens 2004).

Commercial fly-fishing guide services are permitted along the Merced River within El Portal Administrative Site and the park, between the Foresta Road Bridge on the west and the confluence with Yosemite Creek on the east in Yosemite Valley. Fly-fishing is most popular in late September and early October during the caddis fly hatch (Hubner 2004). Fly-fishing is least popular during the warmest summer months because of the difficulty in finding fish and the harm to the fishery that can occur when the water levels drop and the water warms up.

**Swimming.** During the summer, visitors and residents alike swim in the Merced River Canyon. The river between Pohono Bridge and the intersection of El Portal and Big Oak Flat roads is a popular swimming location, despite a lack of appropriate access in many places. There are also numerous swimming holes along the Merced River Canyon, some easier to access than others.

In El Portal, Patty's Hole is a well-known swimming location just west of the El Portal Market, but is not a formally designated day use area. The January 1997 flood washed away a number of trees that had shielded this stretch of the river from view by motorists passing on Highway 140, thus increasing public awareness and use of the swimming area.

**Rafting and Kayaking.** Whitewater rafting and kayaking occur in the El Portal reach for both commercial outfitters and private boaters. This reach of the river is generally considered Class III rapids. Certain sections can be Class V, depending on the flow rate, which attracts boaters from across the state. No commercial rafting operations are permitted upstream of the Foresta Road Bridge; however, there are no regulations on where private boaters may enter the water or when they can run the river. A launch site for private boaters is located adjacent to the Highway 140 Bridge. The NPS does not regulate private boater recreation due to low use levels. Because the Merced River is used seasonally due to the absence of dams, the highest use of the river is directly correlated with the heaviest runoff periods, typically April through mid-July (Horne 2004).

**Hiking.** There are no noteworthy hiking trails within the Merced River gorge segment. Similarly, few visitors hike in the area of El Portal, though day hiking is more common along the old Foresta Road and just west of El Portal along Incline Road.

**Picnicking.** Picnic facilities are available at Cascade Picnic Area and at the Arch Rock Entrance Station.

### Segments 5, 6, and 7: South Fork Merced River

#### *Visitor Facilities and Services*

**Commercial Services.** Dining and retail facilities, as well as a golf course, a snack stand/golf shop, and service station are available in Wawona.

**Trails.** Trails in Wawona, including length and difficulty, are identified in the **table 9-145** below:

**TABLE 9-145: TRAILS IN THE WAWONA AREA**

Trail	Distance	Difficulty
Wawona Meadow Loop (Round-trip)	3.5 miles	Easy
Swinging Bridge Loop (Round-trip)	4.75 miles	Moderate
Wawona to Mariposa Grove (One-way)	6 miles	Moderate
Mariposa Grove of Giant Sequoias		
• Grizzly Giant Tree and California Tunnel Tree (Round-trip)	1.6 miles	Moderate
• Wawona Point (Round-trip)	6 miles	Moderate
• Outer Loop Trail (Round-trip)	6.9 miles	Moderate
Alder Creek Trail (Round-trip)	12 miles	Strenuous
Chilnualna Falls Trail (Round-trip)	8.2 miles	Strenuous

Wilderness access to the South Fork Merced River (Segment 5) is from Forest Service trailheads to the south via a formal NPS trail on U.S. Forest Service land, at the Bishop Creek confluence.

**Interpretation and Education.** Wawona interpretive programming is provided late spring through early fall. Some programs focus on park history from 1864 to present. The Wawona Covered Bridge is a key element in those programs. Stage rides and interpretation of the bridge (through signage and ranger-led walks) and the Pioneer Yosemite History Center help visitors understand the significance of this covered bridge. There are also several programs in Segment 7 that provide opportunities for visitors to understand more deeply the meanings associated with outstandingly remarkable values, such as geology, hydrology, cultural history, recreation, and biology. Those programs involve ranger walks and evening campfire programs. A curriculum-based Environmental Living Program is offered in Segment 7, reaching hundreds of school children each year. Several venues provide space for a myriad of interpretive and education programming.



- Wawona Visitor Center at Hill's Studio is located on the grounds of the Wawona Hotel in the historic art studio that was constructed in the early 1880s for the famous western painter Thomas Hill. It includes a bookstore, orientation area, exhibit hall, and wilderness permit station.
- Wawona Campground Amphitheater consists of wooden benches with metal supports, and a rock-lined campfire circle. The amphitheater does not have a projector screen and has no electricity, so the interpretive programs are the "classic" old-fashioned Campfire Talks.
- Pioneer Yosemite History Center is a collection of historic cabins and a Covered Bridge. The cabins (each of which represent a different chapter in the historic development of Yosemite National Park) were moved to their current location and were relocated next to the then recently restored Covered Bridge as a Mission 66 project to allow park visitors to explore and understand the growth and development of Yosemite National Park and the National Park idea in America.

### *Overnight Lodging Accommodations*

**Wawona Hotel.** The 104-room Wawona Hotel, a national historic landmark, is within the river corridor. Visitor facilities and services at the Wawona Hotel are discussed in the previous section.

### *Campgrounds*

**Wawona Campground.** This is the only NPS campground along the South Fork of the Merced River. It is located adjacent to the river, northwest of the Wawona Hotel and Golf Course. Wawona Campground has 96 sites including one group site, two stock-use campsites, and two campground host sites (NPS 2011f). There are 46 tent-only and four RV-only campsites. The group campsite only accommodates tents. The remaining campsites would accommodate either tents or RVs. Each campsite contains a fire ring, picnic table, and food locker and is near a restroom with potable water and flushing toilets. The six restrooms in the campground (NPS 2011f) are connected to a septic system that is not part of the Wawona sewer collection system. Heavy use at the Wawona Campgrounds can stress the septic system and leach field, creating potential water quality impacts during peak use periods.

### *Recreational Activities*

**Fishing.** As described for the headwaters of the Merced River, the upper watershed of the South Fork Merced River is host to mountain ponds, alpine lakes, and ephemeral streams. Wilderness lakes support relatively good brown and rainbow trout populations. On the South Fork Merced River, however, most fishing (primarily for brown and rainbow trout) takes place downstream of the water intake and impoundment area in Wawona.

**Swimming.** In the South Fork Merced River, swimming is common in the vicinity of Swinging Bridge, alongside the Wawona Campground, and near the picnic area east of the campground. In recent years, swimming has also become more popular through the town of Wawona. Access to the river downstream of Swinging Bridge is somewhat limited due to private property along the river. Natural pools also exist in the upper reaches of the South Fork Merced River and are used by wilderness visitors. Swimming is

prohibited at the pool of the Wawona Domestic Water Intake and 100 yards upstream. A swimming pool is located on the grounds of the Wawona Hotel and is available for hotel guests.

**Rafting and Kayaking.** Limited rafting occurs on the South Fork Merced River between Swinging Bridge and Wawona Campground. In this reach, the river's gradient is relatively flat. As in the valley, rafting regulations have been implemented to protect river habitat and provide for visitor safety in the valley. In general, park management encourages visitors to launch and remove rafts at sandbars and beach locations.

Rafting and kayaking in Wawona must adhere to the following per the *Superintendent's Compendium*, which states, "the South Fork of the Merced River is closed to all vessels, except it is open to non-motorized vessels and floatation devices downstream of the Wawona Swinging Bridge. Vessels are defined by the Coast Guard definition (36 CFR, section 1.5(a)(1); CFR, section 1.5(f)).

**Picnicking.** Wawona visitors have access to picnic areas near the Wawona Store and at the Wawona Campground. These picnic areas offer picnic tables, vault toilets, and garbage and recycling receptacles. The South Fork Merced River Picnic Area, which is located approximately 0.5 mile upstream of the Wawona Campground, has a vault toilet, tables, grills, garbage and recycling.

There are flush toilets and running water at both the campground and the picnic area near the store in Wawona. Presently the toilets at the picnic area are not adequate for the number of people using them, and there is often a long wait to use the facilities. This is exacerbated by the fact that the shuttle stop for Mariposa Grove, which is located there, provides inadequate parking for visitors.

**Hiking.** There are seven hikes in the Wawona area ranging from the easy Wawona Meadow Loop to the strenuous wilderness trails to Alder Creek and Chilnualna Falls. Moderate hikes include the Swinging Bridge Loop, the Wawona to Mariposa Grove trail, and several trails in the vicinity of Mariposa Grove that are not in the study area. There are also numerous informal trails along the river in this area.

#### ***Other Activities in the River Corridor***

**Golf.** Golf is available in Wawona at the historic Wawona Golf Course (established in 1918). This golf course is an organic golf course (free of pesticides and herbicides) and is also a certified Audubon Cooperative Sanctuary. Only authorized golfing parties are permitted to use the golf course because of the danger associated with being hit by golf balls. The length of time the course is open varies year by year, depending on weather conditions, but the course is generally open when the Wawona Hotel is operating between June and October. On average, 25 to 34 groups of four people golf per day. This golf course accommodates approximately 9,000 people per year (NPS 2004d). Some cross-country skiing also takes place on Wawona Meadow and the golf course. Currently, Yosemite is preparing an amendment to the National Historic Landmark District that proposes adding the golf course and Wawona Meadow to the District. The lower portion of the golf course is within the wild and scenic river corridor. The golf course is also used as the spray field for the town's sewer system.

**Tennis.** A tennis courts is located on the grounds of the Wawona Hotel and is available for hotel guests.

### *Environmental Consequences Methodology*

This analysis evaluates the effects of the various alternatives on the visitor experience in the study area. The analysis considers changes in facilities and services, overnight lodging accommodations, camping, and recreation activities. Commercial services include food service, retail, equipment rentals, and other commercial activities. Non-commercial facilities and services include day use areas, trails, interpretation, information, and education. Visitor facilities also include roads and parking areas, which are discussed in detail in the transportation impact analysis and are referenced in this discussion. Overnight lodging accommodations include hotel, motel and cottage rooms; cabins with bath, rustic canvas tent cabins and Housekeeping Camp units. Campgrounds include facilities where visitors supply their own shelter. Recreation activities include hiking, fishing, biking, rock climbing, swimming, floating, nonmotorized boating, auto-touring, picnicking, and horseback riding.

This analysis addresses whether potential management activities under the various alternatives would result in a change in access to, availability of, type of, or quality of visitor facilities and services, overnight accommodations, campgrounds, or recreation activities. While the quality of recreation activities is affected by natural resource conditions, the current discussion does not reanalyze the natural resource impacts of each action within each alternative. Rather, this section references the natural resource impact analysis presented elsewhere in this chapter. Finally, the availability of recreation activities and overnight accommodations, including the comparison of supply and demand, overlap with aspects of the socioeconomic analysis. This section does not reanalyze the socioeconomic impacts of each alternative but instead refers to the socioeconomic analysis presented elsewhere in this chapter.

This analysis evaluates the study area of the Merced Wild and Scenic River, using the following criteria:

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis:
  - Local impacts would be those that occur in a specific area within a segment of the river. This analysis would further identify if there are local impacts in multiple segments.
  - Segmentwide impacts would consist of a number of local impacts within a single segment, or larger-scale impacts that would affect the segment as a whole.
  - Parkwide impacts would extend beyond the river corridor and the study area within Yosemite National Park.
  - Regional impacts would be those that extend to the Yosemite gateway region.
- **Intensity.** The intensity of the impact considers whether the impact to visitor services would be negligible, minor, moderate, or major.
  - Negligible impacts would not be detectable and would not have a discernible effect on visitor services. Where impacts are quantifiable, less than 2.5% of visitor services would be affected in a particular segment of the river corridor.
  - Minor impacts would be slightly detectable, but would not be expected to have an overall effect on the availability of visitor services. Where impacts are quantifiable,

approximately 2.5% to 5% of visitor services would be affected in a particular segment of the Merced River corridor.

- Moderate impacts would be clearly detectable to visitors and could have an appreciable effect on the availability of visitor services. Where impacts are quantifiable, approximately 5% to 10% of visitor services would be affected in a particular segment of the corridor.
  - Major impacts would have a substantial, highly noticeable influence, and could permanently alter access to and availability of visitor services. Where impacts are quantifiable, greater than 10% of visitor services would be affected in a particular segment of the corridor.
- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term.
    - A short-term impact would be temporary in duration, such as short-term impacts associated with construction or restoration activities.
    - A long-term impact would have a permanent effect on the visitor's experience, at least within the planning horizon for the *Merced River Plan*.
  - **Type of Impact.** The type of impact considers whether the impact would be beneficial or adverse to the visitor experience and its effect on access to, availability of, type of and quality of the visitor experience. Beneficial impacts would increase the access, availability, type, or quality of the recreation activities, facility or service, or overnight accommodation. Adverse impacts would reduce access to or availability of visitor services.
    - Access would include actions to increase access, such as Architectural Barriers Act Accessibility Standards (ABAAS)/Americans with Disabilities Act (ADA)-compliance, or changes to access to river segments for boating, etc.
    - Availability includes changes to the inventory available, such as campsites, wilderness permits, etc.
    - Type includes changes to the variety of recreation activities allowed, or the types of overnight accommodations, such as the mixture of tent cabins, hard-side cabins, hotel lodging, and Housekeeping Camp lodging.
    - Quality includes changes to natural resource conditions, trail and facility conditions, presence, or absence of crowding, etc. Judging whether changes to a visitor's experience are positive or negative is subject to personal preferences; what some may view as a desirable change could be considered undesirable by others. Therefore, this analysis considers multiple points of view when drawing conclusions about the type of impact.

## ***Environmental Consequences of Alternative 1 (No Action)***

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), restoration and resource management activities would continue at the current level as part of the park's ongoing management of natural and cultural resources. These activities include selected meadow restoration and riverbank projects, invasive species control, and limited conifer removal from meadows to improve views. Certain alterations to the biophysical environment would

remain including riverbank riprap, abandoned infrastructure in the riverbed, informal meadow trails, conifer encroachment in meadows, and riverbank impacts from scouring and visitor use. For most visitors, the overall quality of the visitor experience would not be affected by current natural resource conditions. For all visitors, the encroachment of conifers into the non-wilderness meadows would reduce the views and vistas that draw many visitors to Yosemite.

### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

Under Alternative 1, visitation to Yosemite Valley is anticipated to increase approximately 3% annually based on current trends. Outside of wilderness areas, where wilderness permits control the number of overnight users, no formal systems or methods for controlling access would be implemented. This annual increase in the number of visitors is likely to exacerbate crowding and congestion on roads and at key visitor sites in the valley.

Increased visitation would likely affect transportation and parking. Visitors would likely experience increased traffic congestion and increased difficulty finding parking, especially during peak visitation months.

Under Alternative 1, all terms and conditions of the visitor services contract between Delaware North Corporation and the NPS would remain as negotiated. Under Alternative 1, this contract would be renegotiated in 2015, presumably with the same terms and conditions as currently exist. Under Alternative 1, the types and amounts of concessioner-operated visitor services currently offered throughout the park would remain as they are currently; however, because the visitor population would continue to expand, there would likely be fewer staff per visitor, which could result in longer lines and more crowding at concessioner-operated visitor facilities and services corridorwide. Visitor facilities and services would not be adjusted to reflect increased visitation.

Under Alternative 1, the number and type of overnight accommodations and campground sites would remain as they are currently. Demand for lodging and camping currently exceeds supply, especially during the peak season. Increasing visitation is likely to exacerbate this problem.

Under Alternative 1, routine trail maintenance would occur consistent with the current programmatic categorical exclusion for trail maintenance in the park. Visitors would experience trail quality consistent with today's conditions and trail conditions would not noticeably diminish. No new trails would be added. Under Alternative 1, there may be continued conflicts between stock and hikers on trails, while some improvements to the visitor experience will continue to be made through existing restoration actions.

Under Alternative 1, educational and interpretive activities related to natural and cultural resources would be guided by current plans and the recommendations of the recent *Comprehensive Interpretive Plan*. This document guides parkwide educational and interpretive activities for the coming five to 10 years. Visitors would continue to have access to a wide variety of interpretive activities, including exhibits, signage, talks, and guided hikes.

## **Segment 1: Merced River Above Nevada Fall**

### ***Impacts of Actions to Protect and Enhance River Values***

In Segment 1 meadows and other sensitive natural areas would continue to be affected by stock grazing and human use. NPS would continue ongoing resource management activities to improve management of stock and restore areas affected by human use.

### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

**Merced Lake High Sierra Camp.** The Merced Lake High Sierra Camp would remain at its present size (60 beds) and operate much as it does today. The Merced Lake High Sierra Camp would remain located on land designated as a Potential Wilderness Addition. The Merced Lake High Sierra Camp is the subject of differing public opinion. Some visitors feel that, despite its location in a Potential Wilderness Addition, the Merced Lake High Sierra Camp is part of Yosemite's history and adds to their visitor experience and should remain in the wilderness. Others feel that the High Sierra Camp is a developed use that is not appropriate in the wilderness and should be removed.

**Camping.** Backpacking and camping in Little Yosemite Valley, Moraine Dome, and the Merced Lake Backpackers camping area would remain unchanged from current conditions. Together, the zone capacities for these areas is approximately 200 campers in designated camping areas. Little Yosemite and Merced Lake Backpackers camping areas would retain the existing facilities including restrooms. (Bear boxes are slated for removal prior to plan adoption). Moraine Dome would continue to have no facilities. Backpackers could also continue to camp away from the Merced River in dispersed sites. Retention of designated campsites would be beneficial to those visitors who appreciate having some facilities (e.g. restrooms) as part of their experience in the wilderness. Some visitors, desiring a more primitive wilderness experience, would experience the designated camping areas and facilities as detracting from their experience. The Wilderness Character section of this chapter evaluates Alternatives 1 through 6 in light of the mandated characteristics of wilderness. This section addresses wilderness from the different perspective of visitor experience.

**Boating.** Actions that would permit (and thus limit) private boating would not be established in wilderness segments.

**Overnight Capacity and Wilderness Permits.** Overnight access to the wilderness would continue to be based upon wilderness zone capacities and regulated by wilderness permits that limit the number of overnight visitors that can enter the wilderness each day at various trailheads. Despite these regulations, some visitors would perceive crowding and an unacceptable number of visitor encounters while others would not. The total capacity of the Little Yosemite Valley Zone would remain at 150. The demand for overnight use permits in the wilderness would continue to exceed supply, leaving some visitors unable to secure a permit and thus unable to have the recreational experience they planned at the time they desired. The estimated number of overnight users in Segment 1 under Alternative 1 is 350 and the estimated number of day users is 380.

**Segment 1 Impact Summary.** Implementation of Alternative 1 would result in segmentwide, long-term, negligible, adverse impacts on visitor experience and recreation within Segment 1.

## Segment 2: Yosemite Valley

### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 1, visitors would have much the same experience as they do today but with more people due to a projected 3% annual increase in visitation. Baseline peak day use, or people at one time (PAOT) within Yosemite Valley under Alternative 1 would continue to be around 8,272, while maximum overnight capacity would remain at about 6,564. The visitor experience of those attuned to natural and cultural resource needs and conditions would likely be lessened by the impacts of human use on some of the valley's meadows and riverbanks and by the presence of structures, campsites, trails, and parking lots within the floodplain, which affect water quality and riverbank condition. Those visitors who are more interested in sightseeing, and who come for a day visit to a few select sites, would likely be less aware of resource impacts. Those visitors who stay longer and visit mainly for recreation may notice some impacts of human use along riverbanks and other high-use areas. All visitors would notice crowding during peak months at many destinations and along trails.

### *Impacts of Actions to Manage User Capacity, Land Use and Facilities*

**Activities.** Under Alternative 1, a wide range of activities would continue to be provided, but many of those activities would be crowded during peak visitation months. Those visitors engaged in water-based activities, such as swimming, rafting, and paddling in the Merced River, would likely experience crowding during peak months. Visitors engaging in land-based activities, such as hiking, bike-riding, horseback riding, and scenic driving, would be similarly affected by crowding. Nonresource-based recreation, such as ice skating and swimming in pools would continue to be available, with visitors using swimming pools experiencing crowding during warm weather. Day use sites, such as Swinging Bridge, Sentinel Beach, and Cathedral Beach, would continue to exceed their intended visitor use capacity and visitors engaged in these activities would likely experience crowded conditions. Picnic facilities and restrooms at these sites would remain undersized. Key destinations, including Yosemite, Bridalveil, Vernal, and Nevada falls and the routes leading to them, would seem crowded on peak days, lessening visitors' experience of these sites.

**Visitor Services.** In addition to recreational activities, the valley would continue to support a wide range of visitor services, including food and beverage facilities such as snack shops, buffets and food courts, bars, restaurants, and grocery stores; and retail establishments including gift shops, sporting goods stores, and bicycle and raft rental facilities. Visitors staying in overnight accommodations do not have an option to cook and rely on the food and beverage services for their meals. Some visitors consider the existing amount of commercial activities to be more than necessary and not in keeping with the natural resource qualities of the valley

**Camping and Lodging.** Under Alternative 1 in Segment 2, a total of 466 campsites would accommodate up to 2,892 people per night, and a total of 1,034 units of lodging — including hotels, lodges, and tent cabins — would accommodate up to 3,672 people per night. In both cases, demand would continue to exceed supply, especially during peak visitation months. Visitors able to secure reservations for lodging or camping may experience impacts resulting from the general crowded



nature of the Merced River corridor during peak months. Those visitors unable to secure lodging in the park would be required to change their plans or stay outside the park.

**Parking.** Under Alternative 1, approximately 2,337 parking spaces would be available for day visitors in the valley. These numbers would not increase with the increase in visitors. Demand for parking currently exceeds supply during peak season. As the number of visitors increases, visitors would notice related increases in congestion, noise, and pedestrian/vehicular conflicts, as well as a reduction in air quality. All of these would negatively affect the experience of most visitors.

**Transportation.** Regional bus service into Yosemite Valley would be expanded during the peak summer season under Alternative 1, allowing an estimated maximum of 720 people per day to arrive in the valley on regional transit. Within the park, shuttle service would continue to operate at seven to ten-minute intervals. Both the number of buses and the frequency would remain constant and could be inadequate to meet the increased number of visitors.

**Total Visitation.** Under Alternative 1, the number of peak day use (PAOT) would be 1,295, and the maximum number of overnight visitors would be 865. There would be no day-use reservation system or ability to control the number of visitors before their arrival at the entrance station. Visitors would be likely to experience some degree of crowding, congestion and difficulty finding parking spaces during periods of peak visitation. The levels of crowding, congestion and difficulty finding parking would increase if numbers of visitors increase during periods of peak use.

**Segment 2 Impact Summary.** Implementation of Alternative 1 would result in segmentwide, long-term, major, adverse impacts on visitor experience and recreation within Segment 2.

## **Segments 3 and 4: Merced River Gorge and El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

Segment 3 (Merced River Gorge) and Segment 4 (El Portal) experience minimal visitor use. Most visitors pass through these segments on their way to and from Yosemite Valley. There are no facilities in Segment 3. Primary facilities in Segment 4 are the El Portal Administrative Facility and the residences and limited commercial facilities in the community of El Portal. Due to the presence of both the Administrative Facility and employee housing, there are human-made features and activities in Segment 4 that affect the Merced River's natural condition, including a levee, abandoned infrastructure, riprap, and roadside parking affecting water quality and the community of valley oaks. Under Alternative 1, these features and activities would continue to affect natural resources and water quality, but would not have a significant effect on the visitor experience due to the small number of visitors to Segment 4.

### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

Segments 3 and 4 under Alternative 1 would continue to be lightly used by visitors. Current visitor activities in Segments 3 and 4 include scenic driving along Highway 140, rock climbing, and river-related activities such as swimming, boating, and fishing. Camping is not allowed in Segments 3 and 4, and no facilities would be provided for camping under Alternative 1. Due to the projected 3% annual

increase in visitation, activities and recreation areas in Segments 3 and 4 may become slightly more crowded as visitors, seeking an alternative to visiting the valley, recreate in this area. NPS visitor facilities in Segments 3 and 4 include the Cascades Picnic Area and the Arch Rock Entrance Station.

**Parking.** Under Alternative 1, there are 180 parking spaces in Segment 3 and 214 parking spaces in Segment 4, mostly along the roadsides and at the store and gas station. Despite future increases in visitation, parking is not likely an issue for recreational visitors in Segments 3 and 4, as recreational use is limited in these Segments.

**Total Visitors.** Under Alternative 1, the number of people recreating in these Segments could increase slightly due to the projected growth in visitors, however Segments 3 and 4 would continue to provide scenery, uncrowded conditions, and a variety of water-based recreation opportunities.

**Segments 3 & 4 Impact Summary.** Implementation of Alternative 1 would result in segmentwide, long-term, negligible, beneficial impacts on visitor experience and recreation within Segments 3 & 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

This area includes wilderness (Segments 5 and portions of Segments 6 and 7), a WSRA wild segment (Segment 8); the Wawona Impoundment (Segment 6), and Wawona (Segment 7). Segments 5 and 8 are remote and undisturbed and resource quality is high due to low use levels. Wawona Impoundment is off-limits to visitors because of safety and water quality concerns. Resource impacts would be most noticeable in Wawona.

Low summer flows related to the Wawona Impoundment and surface water withdrawals could reduce river flows downstream. Visitors participating in water-based recreation activities, especially rafting and floating, may find there is less water available, which could alter the experience and also increase crowding as visitors seek those locations where there is the most water.

Reduced flows may also result in lower water quality due to higher sediment levels. Additionally, water quality issues that could affect the quality of visitors engaged in water-based recreation activities could be negatively affected by ground and surface water contamination from septic tanks and leech fields not functioning properly at the Wawona Campground, which could affect both ground and surface water quality if capacity is exceeded.

Some facilities and activities in Segment 7 would remain in the floodplain, including abandoned infrastructure; the Wawona Campground dumpsite; informal trails, some which extend across private land; and a number of campsites. These activities would continue to cause riverbank erosion. Owners of the private property where visitors trespass to access the Wawona Swinging Bridge would continue to be unhappy with the unauthorized use and the related impacts to their private property. Others, including those visitors accessing the river via informal trails, would continue to seek out dispersed areas to recreate with fewer crowds. Those in the riverside campsites would continue to camp in these locations.

### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

Segments 5 and 8 are remote and would continue to be used by hikers. A small amount of backpacking occurs in Segment 5, and some Class 5 rafting occurs in Segment 8. These segments experience a small number of visitors and the visitor experience is satisfying to those who visit.

**Facilities.** In Wawona, visitors would continue to experience crowding at almost all venues during peak summer months. At the Wawona Store Picnic Area, crowding, resulting from a shortage of picnic facilities, seating, and shade, as well as undersized restrooms, would worsen as the number of visitors increases.

**Recreational Activities.** Visitors participating in hiking, fishing, biking, swimming, and nonmotorized boating would experience increasingly crowded conditions as the number of visitors increases. Opportunities for experiencing solitude while engaging in recreational activities would be lessened, especially during months of peak visitation at popular day-use areas along the river.

The Wawona stables would continue to offer day rides into the wilderness. This would continue to cause minor conflicts between stock and hikers and impact the quality of the trail due to stock urine, feces and flies.

**Parking.** Day parking capacity in Wawona would be 290 spaces, which would become increasingly inadequate as the number of visitors expands. This would increase congestion as people circle the area searching for parking.

**Camping and Lodging.** Under Alternative 1, a total of 99 campsites, including one group and two horse sites, would accommodate up to 618 people per night. A number of campsites would remain in the floodplain, providing a unique opportunity for visitors to camp close to the water. In terms of lodging, a total of 104 units at the Wawona Hotel would accommodate up to 247 people per night. In both cases, demand would continue to exceed supply, especially during peak visitation months.

**Total Visitors.** Visitor use in Segment 7 under Alternative 1 would be approximately 13,443 per day.

**Segments 5-8 Impact Summary.** Implementation of Alternative 1 would result in segmentwide, long-term, moderate, adverse impacts on visitor experience and recreation within Segments 5-8.

### **Summary of the Alternative 1 (No Action) Impacts**

Under Alternative 1, park visitation is expected to increase 3% annually (approximately 117,000 people per year based upon 2011 visitation). Visitor services and facilities, such as restaurants, shops, and raft and bicycle rentals, would continue at current levels. The number and types of overnight accommodations, both lodging and campsites, would not change, remaining at post-1997 flood and rockslide numbers. Access to, availability, and diversity of recreational opportunities in the Merced River corridor would be similar to current opportunities and include the use of nonmotorized watercraft (e.g., rafts, inner tubes, kayaks), swimming and wading, hiking, backpacking, camping, rock climbing, fishing, sightseeing, photography, nature study, bicycling, and stock use. Roads and parking would retain their current configurations.

Alternative 1 would not affect access to or types of visitor facilities and services, overnight lodging, campgrounds, or recreation activities. However, potential increased visitation over time could result in a corridor-wide, long-term, moderate to major, adverse impact on the visitor experience owing to uncontrolled crowding and congestion at existing recreation sites and visitor facilities; the continued inability to meet demand for camping and lodging; and congestion on roads and in parking lots. These impacts would likely be most noticeable during months of peak visitation.

### **Cumulative Impacts of Alternative 1 (No Action)**

Cumulative impacts on visitor experience are based on analysis of past, present, and reasonably foreseeable future actions in and around Yosemite National Park, in combination with potential effects of Alternative 1. The projects identified include only those that could affect visitor experience within the Merced River corridor or in the study area. See Appendix B for a full list of cumulative projects. In general, this includes construction, removal, or improvements to visitor services and does not include employee housing projects.

#### ***Past Actions***

Past actions have generally resulted in beneficial impacts on the visitor experience by providing access to recreational opportunities within the Merced River corridor and the study area, and by improving existing recreation opportunities, visitor facilities and services, and overnight accommodations. However, these past park improvements could be seen as non-beneficial to some visitors who prefer less development and a more primitive experience. These past actions include:

- Various trail and road improvement projects
- Lower Yosemite Fall Project
- Yosemite Valley Campground Restroom improvements
- A range of orientation and interpretation services in and immediately surrounding the Merced River corridor, which include visitor centers, wilderness centers, ranger-led tours, and guided wilderness trips
- The Ahwahnee improvement projects
- Curry Village development
- Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation
- Yosemite Valley campground improvements
- Capital Improvement Fund ABAAS/ADA Compliance improvements

Past actions also include a decrease in overnight lodging and camping facilities in Yosemite Valley. The closure of the Upper River and Lower River campground facilities following the 1997 flood eliminated 376 campsites from use. As a result, there is a shortage of camping opportunities in the valley and demand regularly exceeds supply. Following the rock fall in 2008, an additional 122 lodging units were removed from use due to being located in the rock fall hazard zone.

### ***Present Actions***

Similar to past actions, present actions would result in beneficial effects. New and improved facilities enhance visitor experience. However, management plans can result in both adverse and beneficial impacts on visitor experience. For example, management plans may reduce or close existing recreational opportunities that some visitors would see as adverse for the lack of access to these resources. However, limiting recreational opportunities due to congestion would improve opportunities for solitude and a primitive and unconfined recreational experience for other visitors. Specific examples of present actions include the following:

- ***Improved Facilities:*** *Ahwahnee Comprehensive Rehabilitation Plan*, Rehabilitate Wawona Road, Tioga Road Rehabilitations
- ***New Visitor Facilities and Services:*** Wahhoga Indian Cultural Center
- ***Management Plans:*** *Half Dome Trail Stewardship Plan*, Recreation Facility Analysis, *Scenic Vista Management Plan*, *Comprehensive Interpretive Plan*

### ***Reasonably Foreseeable Future Actions***

Future actions could result in both beneficial and adverse effects. New and improved facilities that would enhance visitor experience include:

- Curry Village Rehabilitation
- Ahwahnee Dormitory Seismic Upgrades
- The Ahwahnee Improvements

Future actions that could benefit visitor services include:

- Concessioner Prospectus updates
- Curry Village and Ahwahnee facility improvements

Management plans that could result in a lack of access for some visitors and an improved experience for other visitors include:

- *Forthcoming Yosemite Wilderness Stewardship Plan/EIS*
- *Half Dome Trail Stewardship Plan*

### ***Overall Cumulative Impacts of Alternative 1 (No Action)***

Future management of Yosemite National Park, particularly areas within or near the Merced River corridor, could result in both beneficial and adverse impacts on visitor experience, as described above. Alternative 1, when considered with past, present, and future actions, would continue to allow for availability and diversity of recreation activities and visitor services and facilities similar to current conditions. This could result in enhanced visitor experience for some and reduced access for others. Thus long-term, adverse impacts would be moderate.

Alternative 1 would contribute to the adverse cumulative effect of crowded localized conditions along the river corridor.

Alternative 1 would not address the shortage of camping and overnight lodging opportunities in Yosemite Valley. Although this would not have a cumulatively additive effect compared with current conditions, when compared to conditions at the time of designation (1987), this would continue to be a reduction in camping opportunities in the study area. This would have a long-term, adverse impact on the availability and diversity of visitor services.

With the NPS anticipated 3% increase in annual visitation, crowding and congestion could increase in the gateway communities as visitors seek overnight lodging, meals, supplies, and fuel outside of the park. This could be considered a regional, short-term, moderate, adverse impact. However, in the long-term, this may be a beneficial impact because more services and facilities could be provided to visitors in areas outside of the park, thus decreasing congestion and crowding within the park. The inability to meet camping and lodging demand could constitute a regional, long-term, moderate, adverse impact because some visitors would be displaced as a result of an insufficient number of campsites and lodging units in the park.

### ***Environmental Consequences of Actions Common to Alternatives 2–6***

#### **Corridorwide Actions**

##### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Corridorwide programmatic biological resource actions common to Alternatives 2-6 include removal and restoration of informal meadow trails; removal of conifer seedlings from meadows; restoration of eroded riverbanks; establishment of a 150' riparian protection zone where new development would be prohibited and removal/relocation of all campsites within 100 feet of the ordinary high water mark.

These actions would improve natural resources and the visitor experience. Eliminating informal trails would improve the overall quality of the trail system which is beneficial to the visitor experience. For a small number of visitors the closure and revegetation of meadow trails would be considered a limitation on access and availability. Associated educational and interpretive actions would improve visitor understanding of natural processes.

Actions to remove vegetation encroaching in meadows would improve views and vistas to and from key locations within the Merced River corridor and improve the visitor experience for most visitors. Being able to experience the views and vistas of important natural landmarks is a significant component of passive recreational activities, such as sightseeing, contemplation, and painting, as well as active pursuits such as hiking. If prescribed fire is used to eliminate encroaching vegetation, visitors present at the time of the burn would experience smoke and poor air quality. This would be a short-term, minor adverse impact on the visitor experience.

Removal and relocation of campsites would eliminate access to and availability of camping in close proximity to the water. This would diminish the visitor experience for those accustomed to these campsites.

There are no project level biological resource actions proposed for Alternatives 2-6.

**Hydrologic/Geologic Resource Actions.** Corridorwide programmatic hydrologic/geologic resource actions common to Alternatives 2-6 include removal of underground infrastructure that alters hydrology; removal of riprap and replacement with native vegetation; and management of large wood. These actions would improve natural resource conditions and hydrologic function throughout the corridor thereby enhancing the quality of the visitor experience.

Corridorwide hydrologic/geologic resource projects common to Alternatives 2-6 include removal of underground infrastructure that alters hydrology; removal of riprap and replacement with native vegetation; and management of large wood. These actions would improve natural resource conditions and hydrologic function throughout the corridor thereby enhancing the quality of the visitor experience.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Programmatic biological resource actions common to all alternatives in Segment 1 include:

- Relocating trails out of sensitive habitats
- Removal of informal trails and revegetation with native plants in Merced Lake Shore Meadow
- Rerouting trails from wetlands in Echo Valley and mineral spring outflow between Merced and Washburn Lakes
- Rerouting trails from Triple Peak Fork Meadow

These natural resource improvements would enhance the natural character of the wilderness in Segment 1 and improve the quality of the visitor experience. Boardwalk construction would detract from the undeveloped character of Segment 1. Relocating trails would be a preferable solution in the wilderness.

#### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

**Boating.** Under Alternatives 2-6, boating would be allowed in Segment 1. Allowing boating in Segment 1 by permit would provide a changed recreation opportunity. For those visitors who prefer a pristine wilderness experience with little human-caused disturbance, boating (even under permit) in Segment 1 would detract from the quality of their visitor experience.

**Segment 1 Impact Summary:** Actions to protect and enhance river values within Segment 1 would have a local, long-term, negligible to minor, beneficial impact on visitor experience and recreation. Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternatives 2-6 include: removing one and formalizing five other vehicle pullouts for river access along El Portal Road, restoring 4.5 acres of riparian habitat in the area of Yosemite Lodge, 20 acres in the area of the western portion of the Former Upper Pines Loop Campground, and removal of infrastructure and restoration of an additional 30 acres at the Former Upper and Lower Pines campgrounds; restoring impacted areas of Ahwahnee Meadow, which includes removal of tennis courts; improving access and removing infrastructure from riparian areas at Cathedral Beach, Housekeeping Camp, and Bridal Veil; constructing a boardwalk extension to reduce Sentinel Meadow trampling; fencing and vegetation management at Stoneman Meadow, restoring floodplain habitat at Devil's Elbow, and filling ditches not serving current operational needs. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks.

These projects would have significant short-term impacts on the visitor experience by limiting visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. The larger the project in size and the longer its duration, the greater the impact on the visitor. In certain circumstances, restoration activities, although beneficial to the resource, may alter the visitor's experience by limiting direct interaction with natural resources (e.g. touching versus seeing). Generally, increased visitor use results in greater restrictions in order to protect the resource and therefore would have a short-term, minor, adverse impact on visitor experience. Visitor experience benefits include improved river access, and opportunities for education and interpretation of restoration action. In the long-term, the results of these actions would improve natural resources and hydrologic function and would have moderate beneficial impact on visitor experience.

**Hydrologic/Geologic Resource Actions.** Programmatic hydrologic/geologic actions Common to Alternatives 2-6 in Segment 2 include installation of constructed log jams and bioengineered stabilization on riprap at Superintendent's Bridge; placement of large wood to lessen scouring from Clark's Bridge and the road bridge at Happy Isles; relocating the Upper Pines Dump Station to protect water quality; removal of 3800' of pack stock trail adjacent to the river; redesign of the Swinging Bridge Picnic Area; placement of large wood at Sentinel Bridge to improve free-flow; and development of a large wood management policy. These projects would all involve short-term construction impacts, and closure of the areas where work is occurring. In the long-term, these actions would have a moderate, local beneficial impact on the natural environment and hydrologic function of the river and the quality of the visitor experience. The redesign of the Swinging Bridge Picnic Area would also improve access to and the quality of this visitor facility.



Hydrologic/geologic projects also include the removal and revegetation of 3,400 feet of riprap. The 3,400 feet of restoration will take place at several locations along Leidig Meadow; along Sentinel Boardwalk; near Sentinel Crossover; on the west side near Housekeeping Camp Bridge, on both sides of the river at Stoneman's Bridge; two small areas south and east of the Ahwahnee Bridge; a small area east of Lower Pines Campground; and an area northeast of the Upper Pines Campground. In addition, the removal of 2300' of riprap and riverbank stabilization is also common to all. Stabilization activities are planned at Swinging Bridge and Superintendents Bridge; and along the northern riverbank from Ahwahnee Bridge to Sugar Pine Bridge. In the short-term, these projects would have a local, moderate, adverse impact on the visitor experience due to construction impacts, restricted access to the areas of the river where riprap is being removed, noise and dust caused by equipment use and trucks, and increased congestion caused by trucks used to haul riprap from the project area. In the long term, this project would greatly improve the natural character and hydrologic function of the river and therefore improve the quality of the visitor experience by reducing the flood hazard, and restoring meadows and the riparian environment which is visually pleasing.

Removal of the abandoned gauging station at Pohono Bridge; and removal of former Happy Isles footbridge footings and gauge station are two additional projects that are Common to Alternatives 2-6 in Segment 2. These two projects would have a short term adverse effect on the visitor experience due to construction impacts and possible closure of Pohono Bridge. The latter action would eliminate circulation involving this bridge until construction is completed. In the long term, this project would greatly improve the natural character and hydrologic function of the river and therefore improve the quality of the visitor experience by reducing the flood hazard, and restoring meadows and the riparian environment which is visually pleasing.

Placement of eight constructed log jams in the channel between Clark's and Sentinel Bridges would have a short term adverse impact on the visitor experience due to construction impacts including closure of this stretch of the river for up to 12 weeks and noise, compaction, and dust from heavy equipment and trucks used to transport logs and place and secure the log jams. In the long term, this project would improve hydrologic function of this stretch of the river which would lessen scouring and river widening, improving natural conditions and the visitor experience in part by removing obstacles to boating,

A final project Common to Alternatives 2-6 in Segment 2 is the restoration of 8.7 acres of riparian ecosystem at Yosemite Lodge where units were lost during the 1997 flood. This action would have a short-term adverse effect on visitor experience due to construction impacts and closure of this area. Opportunities for education and interpretation of this restoration project during construction would enhance this aspect of the visitor experience. Once complete, this project would improve the natural character and hydrologic function of this area, improving the quality of the visitor experience by reducing the flood hazard, and restoring meadows and the riparian environment which is visually pleasing.

**Cultural Resource Actions.** Programmatic cultural resource actions common to alternatives 2-6 in Segment 2 involve rerouting roads and trails; closure and restoration of informal trails; removal of infrastructure; removal of graffiti; and restoration of traditionally used plant populations. Most of these actions would include some form of education and interpretation that would increase access to

and availability of information and enhance visitor understanding of cultural resources. Rerouting or closing and restoring informal roads and trails and removal of infrastructure and graffiti would also improve natural resources and therefore, the visitor experience. In those areas where cultural resources are also used for climbing, eliminating access to these sites would have a short term local adverse impact on those who use these areas.

There is one cultural resource project in Segment 2 that is common to Alternatives 2-6. This project would fence off access to a large bedrock mortar near Yosemite Lodge, eliminating the non-technical climbing on this feature. Eliminating this recreational activity would be a local, short-term negligible adverse impact. Protection and interpretation of this resource would improve the educational and interpretive component of the visitor experience. Overall this project would have a local, minor, long-term beneficial impact on the visitor experience.

**Scenic Resource Actions.** There are no programmatic scenic resource actions proposed for Segment 2 that are common to Alternatives 2-6.

There are several projects that propose the thinning and removal by mechanical methods of trees greater than 6" dbh in order to improve near and distant views of meadows, waterfalls, and key features such as Half Dome and El Capitan. In the short-term these projects would have local, minor, adverse impacts on the visitor experience as the areas where the tree removal is occurring would likely be inaccessible to visitors; and tree removal projects may create noise and dust. Once complete, these projects would improve access to views and vistas from trails, bridges, picnic areas, roads and buildings in Segment 2. Because viewing the scenery is an important aspect of the visitor experience, these projects would have a local, moderate, long-term beneficial impact on the visitor experience. Many of these projects also involve restoration of the project areas once tree removal is complete. This includes closure and revegetation of informal trails created by visitors in order to access a view; and restoration of meadows and project areas once trees have been removed. These actions would improve the natural resources in those project areas where restoration is proposed which would be a local, moderate, long-term beneficial impact on visitor experience.

### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

**Recreation Facilities.** Recreation activities removed under Alternatives 2-6 would include The Ahwahnee and Yosemite Lodge pools, the Ahwahnee tennis court (currently unused), bike rental facilities at Curry Village and Yosemite Lodge, and the Curry Ice Rink.

The removal of the Yosemite Lodge swimming pool would likely affect a large number of visitors. Currently, both the Yosemite Lodge Pool and the Curry Village Pool are open to the public, while the use of the Ahwahnee pool is limited to hotel guests. The pools are well used in the summer months and provide opportunities for swimming under the supervision of qualified lifeguards during periods when river conditions are not suitable for swimming. Removal of the Yosemite Lodge Pool would leave only the Curry Village Pool to meet the public demand for pool swimming. The Yosemite Lodge pool is larger, with greater capacity than the Curry Village pool, thus its removal is likely to result in crowding at the Curry Village Pool.

All bicycle rental facilities would be removed under Alternatives 2-6, although visitors could still bring their own bikes for riding. The bicycle rental facilities, which are located in Curry Village and Yosemite Lodge also rent bicycles with attached trailers for children, strollers, wheelchairs, electric mobility scooters, hand crank bicycles (recumbent bicycles), and tandem bicycles for use by riders with limited vision. While the actual number of visitors who utilize these services is small in comparison to total valley visitation, the impact of eliminating the service is likely to be significant to those who need accommodation. Eliminating this service would eliminate this activity for all visitors who did not bring their own bicycle or other form of mobility equipment to address special needs. Removing bicycle rentals would reduce the number of visitors able to experience riding throughout the valley; and could increase vehicular congestion and/or shuttle bus crowding as visitors may choose to drive or take a shuttle bus to the various destinations within the valley that were easy to access by bicycle but too spread out for walking.

The Curry Ice Rink is well-used during periods of peak winter visitation. Although the ice rink does not specifically connect visitors to the Merced River, it does provide an outdoor recreation experience surrounded by the natural features of Yosemite Valley. The ice rink also provides an opportunity to engage youth in park experiences.

All commercial stock day rides would be eliminated in Segment 2 under Alternatives 2-6. For those visitors who are unable to walk a great distance, stock rides provide an opportunity to access Mirror Lake and view Vernal Falls without being on foot. It also provides an activity for those visitors who spend several days in the valley and desire different types of experiences. However, elimination of day stock rides would improve trail conditions by eliminating the dust, feces, flies and urine related to stock use on these trails. This would be a benefit to hikers whose visit is negatively affected by such conflicts.

Also common to Alternatives 2–6 would be substantial improvements to Cathedral, Sentinel, and Swinging Bridge picnic areas. These areas are currently affected by overuse. Improvements would increase the overall quality of these areas by improving restrooms and parking, reducing crowding, and directing visitors to specific use areas.

A wide variety of nature-based recreational activities, such as hiking, visiting key destinations, contemplation, and river swimming, would remain under Alternatives 2–6.

**Commercial.** Commercial and visitor services that would be removed from or repurposed to a noncommercial use under Alternatives 2–6 include the Happy Isles and Yosemite Lodge snack stands, the Concessioner Garage building, the Yosemite Lodge Nature Shop, Village Sport Shop (which would become a visitor contact center), the Yosemite Art Center, and the Concessioner General Office. Removal of these facilities would require visitors to find some commercial items elsewhere. In the case of food, many options would remain; however, for visitors needing sporting equipment, the removal/repurposing of the Village Sport Shop would be inconvenient and could alter travel plans if an essential piece of equipment was forgotten. Emergency auto services would still be available as the Concessioner Garage service would be relocated to the Government Utility Building. Removal of the Yosemite Art Center would affect the visitor experience of those familiar with the facility and its

offerings. Over time, visitors would become accustomed to the absence of these facilities and would no longer expect them as a part of their experience in Yosemite.

**Interpretation.** Interpretive and educational activities common to Alternatives 2–6 in Segment 2 would include the addition of an interpretive (nature) walk through the former Lower River Campground. This and other interpretive and educational activities benefit visitors and improve their experience because they are better able to understand river-related natural processes, the park’s ecological restoration work, and how they can protect the river.

**Transportation.** Transportation improvements that would simplify visitor access under Alternatives 2–6 include the addition of shuttle stops at Camp 4 and at El Capitan Meadow. These would provide much needed visitor access to these frequently visited destinations.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in short-term, minor, adverse impacts on visitor experience. Over the long-term, these actions would have moderate beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have local, short-term, minor, adverse impacts. Over the long-term, these actions would have minor beneficial impacts on visitor experience and recreation within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 4 under Alternatives 2-6 include removing asphalt and imported fill from the Abbeville and Trailer Village areas. The project would require the use of a skid steer and dump truck, and take several weeks to complete. The closure of this site, construction disturbance, and resulting noise and dust would have a local, short term, minor, adverse impact on visitor services.

**Hydrologic/Geologic Resource Actions.** Programmatic hydrologic/geologic actions Common to Alternatives 2-6 in Segment 4 include removal of abandoned infrastructure at Cascades Picnic Area and development of mitigation measures for revetment construction and repair. The former action would improve the Cascades Picnic Area which would improve access to this facility and the quality of the visitor experience. This would also improve the natural character and hydrologic function of this area, another benefit to the visitor experience.

**Cultural Resource Actions.** There are three programmatic cultural resource actions in Segment 4 that are Common to Alternatives 2-6. These actions involve removal of abandoned infrastructure, informal trails and roads to protect cultural resource sites. Protection and interpretation of cultural resources would benefit the educational and interpretive component of the visitor experience.

**Scenic Resource Actions.** The Scenic Vista Management Plan in the Merced River Corridor sets forth one project in Segment 3 to remove conifers at the Cascade Falls viewpoint to maintain views of the falls. This project involves the removal by mechanical methods of a maximum of 14 trees greater than 6 inch diameter breast height. In the short-term this project would have local, minor, adverse impact on

the visitor experience at Cascade Falls during tree removal as this area would likely be inaccessible to visitors; and tree removal may create noise and dust. Once complete, this project would improve access to views of Cascade Falls from this viewpoint. Because viewing scenery is an important aspect of the visitor experience, this project would have a local, moderate, long-term beneficial impact on the visitor experience.

### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

**Visitor Facility.** Under Alternatives 2–6, a public restroom would be constructed in El Portal to accommodate visitors traveling to and through the El Portal Administrative Site. Because one does not exist at present, this would improve the experience of recreational visitors.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in long-term, minor, beneficial impacts on visitor experience and recreation within Segment 3. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor, beneficial impacts.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions common to Alternatives 2–6 that are designed to protect and enhance resource values in Segments 5, 6, 7 and 8 include water conservation measures to provide more water for river-dependent species. This would also improve the quality of water-based recreation activities owing to increased flows in the river. Other actions that are designed to improve flow and enhance river function include removal of abandoned infrastructure, removal of a dumpsite adjacent to the South Fork Merced River, and relocation of the Wawona Maintenance Yard away from the river. In each of these cases, the native ecosystem would be restored. As opposed to seeing facilities and infrastructure along the river, visitors would experience a much more natural corridor, which would improve the quality of their experience.

A new operations facility would be constructed, which would improve operational efficiency but would have no direct effect on visitor experience.

River access would be formalized near the Wawona Store, which would greatly improve the condition of the slope in this area. Visitors would be directed to a path that would provide river access while protecting and restoring denuded riverbanks. This would enhance visitor safety by providing a formal route to the river and improving natural resources. Similar improvements would occur at the Wawona Picnic Area along the South Fork Merced River, thus benefitting both natural resources and visitors.

**Hydrologic/Geologic Resource Actions.** Programmatic hydrologic/geologic actions Common to Alternatives 2-6 in Segment 7 include restoration of the Greenemeyer Sandpit and formalizing roadside parking to reduce water quality contamination. The former action would improve natural resource quality and hydrologic function of the river in this Segment and would therefore benefit the visitor experience. Formalizing roadside parking would provide access to removal of abandoned infrastructure at Cascades Picnic Area and development of mitigation measures for revetment

construction and repair. The former action would improve the Cascades Picnic Area which would improve access to this facility and the quality of the visitor experience. This would also improve the natural character and hydrologic function of this area, another benefit to the visitor experience.

**Cultural Resource Actions.** There is one programmatic cultural resource action in Segment 5 and four in Segment 7 that are Common to Alternatives 2-6. These actions involve removal of informal trails and parking, relocation of campsites to protect cultural resource sites from unintentional damage, and preparation of a site management plan for the Wawona hotel to reduce construction and visitor use impacts on cultural resources. Protection and interpretation of cultural resources would benefit the educational and interpretive component of the visitor experience.

### *Impacts of Actions to Manage User Capacity, Land Use and Facilities*

**Visitor Facilities.** Under Alternatives 2–6, the visitor facilities and restrooms at the Wawona Store would be renovated. This action would add additional picnic facilities, seating, and shade and also expand the restroom facilities, which currently are undersized for the number of people served. Visitors waiting in this area for a shuttle would experience a more comfortable, less crowded environment.

The restrooms at Wawona Campground would also be renovated under Alternatives 2–6. The addition of a new, expanded facility would benefit campground visitors and replace an aging system.

Also common to Alternatives 2–6 in Segment 7 is the construction of a new trail across public land on the south side of the South Fork Merced River to access the Wawona Swinging Bridge. Restrooms, waste disposal, and parking would also be added. A formal trail would make it easier for visitors to access various parts of the river without travelling on informal trails across private land. New facilities would enhance the quality of the visitor experience, making it easier to park and spend the day on the river.

Under Alternatives 2–6, wilderness limited boating would be allowed in the South Fork Merced River wilderness (Segments 5 and 8). Boating in Segments 5 and 8 would provide a recreation opportunity and enhance the visitor experience for those visitors who participate in this activity. For those visitors who prefer a pristine wilderness experience with little human-made disturbance, the addition of boating in Segments 5 and 8 would detract from the quality of their visitor experience.

**Segments 5-8 Impact Summary:** Actions to protect and enhance river values would result in long-term, minor, beneficial impacts on visitor experience and recreation within Segments 5-8. Actions to manage user capacities, land use, and facilities would also have local, long-term, minor, beneficial impacts.

### **Summary of Impacts Common to Alternatives 2–6**

Actions common to Alternatives 2–6 serve as a basis for the improvement of biological, scenic, hydrological/geologic and cultural improvement in all alternatives. Actions to manage visitor use and experience would result in the restoration of 166 acres of meadow and riparian habitat areas. Actions to manage facilities and use eliminate many non-resource-based activities and facilities, such as ice

skating, snack stands, and retail facilities; improve restrooms; allow wilderness boating; and construct new trails and access points. With implementation of mitigation measure MM-VEX-1, as appropriate (see Appendix C), actions common to Alternatives 2–6 would have a corridorwide, long-term, moderate, beneficial impact on access to and availability of recreation and visitor services and would improve the overall quality of the visitor experience by reducing development, improving natural resource quality and increasing the natural resource focus of the visitor experience.

### ***Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **All River Segments**

##### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Manage User Capacity and Facilities***

Under Alternative 2 in Segment 1, the most notable changes to the visitor experience would be the removal of the Merced Lake High Sierra Camp; all designated camping converted to dispersed camping; and reduced wilderness zone capacities. Reduced capacities and dispersed camping allow for the opportunity for visitors to camp out of sight and sound from other campers.

**Merced Lake High Sierra Camp.** The removal of Merced Lake High Sierra Camp would eliminate overnight lodging in Segment 1. The camp and all related infrastructure would be removed and the camp would be designated as wilderness. This would create an experience where visitors are self-reliant and the landscape is natural and undeveloped. For visitors who desire this type of experience, the removal of the camp would be beneficial; however, there are many visitors for whom the Merced Lake High Sierra Camp defines the quality of their recreational experience. Some have been visiting this and other High Sierra Camps for generations. Others support the potential Historic District designation of the High Sierra Camp, believing it is a cultural resource from the early days of the park. For these visitors, the closure of the Merced Lake High Sierra Camp would have an adverse effect on their experience both in the wilderness and generally in Yosemite.

**Camping.** Overnight camping at designated campsites would be eliminated under Alternative 2 in favor of dispersed camping. Dispersed camping and minimal facilities are in keeping with the undeveloped quality of the wilderness. Visitors seeking a true wilderness experience would benefit from these changes. Visitors who desire less crowding but still appreciate a designated area to camp with provision of minor facilities may have a somewhat less positive visitor experience owing to the increase in dispersed camping and removal of facilities.

**Wilderness Capacity.** Under Alternative 2, the capacity of the Little Yosemite Valley Wilderness Zone would be reduced by 83%, from 150 to 25. Because zone capacity and wilderness permit numbers are related, the number of wilderness permits would also be reduced which would result in even greater difficulty gaining access to the wilderness. However, the reduction in overnight visitors would improve the solitary nature of wilderness camping.

**Visitor Use.** Wilderness Zone capacities in Segment 1 would be reduced from 380 people under Alternative 1 (No Action) to 195 under Alternative 2, a reduction of 47%. The number of day visitors would remain at 350. This decrease in overnight visitors would reduce the number of wilderness encounters and increase the experience of solitude in the wilderness. Some visitors would benefit from the reduction in activity and visitation; others would be less concerned with these issues because they perceive the wilderness as already uncrowded.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, moderate, adverse impacts on visitor experience and recreation within Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removing buildings from the Yosemite Lodge area, restoring of areas from which Yosemite Lodge development was previously removed due to flood damage, and rerouting and revegetating a portion of the Valley Loop Trail. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities, and the end result of restored natural areas, would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the impacts would be long term and beneficial.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 2 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing campsites and infrastructure from the 100-year floodplain and restoring 25.1 acres of floodplain and riparian habitat; and removing informal trails and informal parking at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks.

These projects would have significant short-term impacts on the visitor experience by limiting visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. The larger the project in size and the longer its duration, the greater the impact on the visitor. In certain circumstances, restoration activities, although beneficial to the resource, may alter the visitor's experience by limiting direct interaction with natural resources (e.g. touching versus seeing). Generally, increased visitor use results in greater restrictions in order to protect the resource and therefore would have a short-term, minor, adverse impact on visitor experience. Visitor experience benefits include opportunity for education and interpretation of restoration action. In the long-term, the results of these actions would improve natural resources and hydrologic function and would have moderate beneficial impact on visitor experience.



**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 2 include: relocating unimproved Camp 6 parking and rerouting a portion of Northside Drive; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. These actions would likely limit visitor access while these areas are being restored. Construction impacts including truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the projects would be long term and beneficial.

The scale of restoration proposed under Alternative 2, in combination with activities common to Alternatives 2–6, would change the physical appearance of Yosemite Valley. There would be fewer roads, trails, buildings, and bridges, and noticeably more relatively undisturbed natural areas. Because the number of visitors would also be controlled under Alternative 2 (see discussion below), the reduction in roads, trails, and riverbank access under Alternative 2 would not result in crowding on the remaining roads and trails.

The interpretive and educational opportunities associated with this scale of restoration would explain these landscape-level changes to visitors. Education would benefit all visitors but would especially help explain why the appearance of the valley has changed.

#### *Impacts of Actions to Manage User Capacity and Facilities*

**Visitor Use Levels.** Under Alternative 2, visitors would experience much less crowding in Segment 2 because peak day use levels would decrease by 18%, from 8,272 to 6,289 PAOT; while maximum overnight capacity would decrease by 28%, from 6,564 to 4,758 people per night. Access to the East Valley by private vehicle would be managed through a day use parking permit system that would require the purchase of a permit before entry. Alternative 2 would significantly reduce the maximum daily visitation to Yosemite Valley from current levels; however, demand is likely to significantly exceed supply during peak season, resulting in many dissatisfied individuals unable to access parking in the East Valley. Implementing the permit system would benefit those visitors who are able to secure a permit because the valley would be much less crowded during peak season and provide an improved visitor experience.

**Camping and Lodging.** In keeping with the resource-based experience focus of Alternative 2, total camping would be decreased in Segment 2, from the 466 existing campsites to a total of 450 campsites. More notably, lodging would decrease by 46%, from 1,034 rooms to 556 rooms, due to the removal of Yosemite Lodge and Housekeeping Camp. The total overnight capacity would decrease by 38%, from 6,564 to 4,758. The reduction in total overnight accommodations would exacerbate the demand for overnight facilities, which would continue to exceed the supply.

**Parking.** Day parking would decrease by 23% from 2,337 spaces currently to 1,800 spaces and peak day use within these areas would decrease from 8,272 to 5,858. The greater reduction in day visitors,

coupled with other transportation-related improvements and alternatives, would make finding parking much easier and reduce congestion and crowding significantly during peak months.

**Recreation Facilities.** Additional developed facilities removed under Alternative 2, in addition to those common to Alternatives 2–6, would include the Curry Village stables and the visitor-serving retail facilities contained in Yosemite Lodge — the gift shop, and Mountain Room Bar. The removal of the stables would eliminate this type of recreation from the valley. The actions common to Alternatives 2–6 would eliminate many other types of active recreation, including bicycle rentals, tennis, most swimming pools, ice skating, and so forth. Removal of these additional activities would create an environment characterized mostly by nature-based activities, such as hiking, wildlife viewing, limited boating, and swimming at designated beaches. Removal of additional retail, in addition to the actions common to Alternatives 2–6, would make the valley much less commercial, providing mostly for basic needs, with a focus on experiences that are nature based.

Raft rentals would be discontinued under Alternative 2 in favor of private boating, which would be limited to 25 trips per day with designated put-in and take-out locations. This would significantly reduce access to boating in Segment 2 and affect those visitors who come to Yosemite to participate in water activities. The limit on the number of trips per day would further reduce the opportunity to participate in this experience. With limited put-in and take-out locations, which are also day use areas, crowding could increase.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.

### **Segment 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish oak protection areas in the Odgers' fuel storage area and the parking lots adjacent to this area. Parking and new building construction would be prohibited within the oak protection areas. The restoration of this area would improve natural resources and have a local, long-term, negligible beneficial impact on the visitor experience.

#### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

**Boating.** Alternative 2 would implement boating restrictions in Segments 3 and 4, limiting put-in and take-out locations as well as the number of boats per day. This would reduce the ability of visitors to casually boat on the Merced River.

**Parking.** The day parking capacity would be the same under Alternative 2 as under Alternative 1, with 180 spaces in Segment 3 and 214 spaces in Segment 4. Parking is not likely to be an issue for visitors in Segments 3 and 4. Under Alternative 2, the number of visitors passing through Segments 3 and 4 and those recreating in Segment 3 and in Segment 4 are expected to remain constant, with no change from that under Alternative 1.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Manage User Capacity and Facilities***

This area includes wilderness (Segments 5 and 8), the Wawona Impoundment (Segment 6), and Wawona (Segment 7). Segments 5 and 8 are remote and undisturbed, and resource quality is high in these segments due to very low levels of use. There are no developed activities or facilities in Segments 5 and 8. Segment 6, the Wawona Impoundment, is off limits to visitors because of safety and water quality concerns.

**Camping.** In keeping with the restoration theme of Alternative 2, all campsites would be removed from the 100-year floodplain. Visitors who value improved resource conditions would find removal of these campsites beneficial to their experience and in keeping with this restoration-intensive alternative. Removal of these campsites would have a negative impact on the experience of those visitors for whom camping close to the South Fork Merced River is an important part of their experience of Yosemite.

**Recreation Facilities.** To accommodate the increased restoration focus of Alternative 2, visitors would experience a reduction in the number of facilities and services available, including golf, tennis, and riding. Most noticeably, the Wawona Golf Course and golf shop would be removed under Alternative 2 and the site restored. This would eliminate golfing in the South Fork Merced River corridor. This action would negatively affect visitors for whom golf is an important part of their experience. For those visitors who do not golf or feel golf is an inappropriate activity so close to the river, the removal of this facility and the restoration of the site would be a benefit.

Removal of the Wawona tennis courts would eliminate tennis as a recreational activity in the South Fork Merced River corridor. This might prove to be a disappointment to the hotel visitors who seek out tennis as part of their Yosemite experience. However, this likely involves a small number of guests. For most guests, the removal of tennis would have no effect on their experience in Wawona, and in the long run the removal might improve their experience by affording them more nature-based, river-dependent activities.

Removal of the Wawona stables would completely eliminate day rides from Segment 7. For visitors who participate in these activities, this action would negatively affect their visitor experience. However, participation in these activities is limited, so its removal would not affect most visitors to Wawona.

**Boating.** Boating would be allowed in Segment 7, but regulations would limit put-in and take-out sites. This would negatively affect those visitors who are accustomed to unrestricted boating access in Segment 7.

**Parking.** Total parking spaces in Wawona would remain at 290 spaces. This number is currently inadequate during peak times, and visitors would continue to experience crowding and congestion as they search for parking.

**Overnight Accommodations.** The number of overnight lodging units at the Wawona Hotel would remain the same as under Alternative 1. Demand for overnight reservations would continue to exceed demand throughout the season. The removal of 32 campsites from the Wawona Campground would result in a 33% reduction in the number of campsites. Demand frequently exceeds supply at this campground and removal of these sites, coupled with similar visitation levels, would exacerbate this problem.

**Total Visitation.** Peak day use levels (PAOT) would increase over that of Alternative 1, from 1,295 to 1,321, primarily due to increased transit use.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.

### **Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Alternative 2 is the most restoration-intensive of all the alternatives, focusing on self-reliant visitor experiences and extensive floodplain restoration. Visitors would experience fewer roads, trails, buildings, and bridges, and noticeably more relatively undisturbed natural areas. Restoration actions would improve the quality of natural resources and thus the overall visitor experience. However, under Alternative 2, the extent of the restoration actions, a total of 347 acres in addition to those restoration actions common to Alternatives 2-6, though highly beneficial to resource conditions and river function, would noticeably reduce access to and availability of recreation and visitor services. Actions under Alternative 2 would generally eliminate recreational activities that are not directly resource based. These actions would include closure of Merced Lake High Sierra Camp; an 87% decrease in Little Yosemite Valley Wilderness Zone capacity and related reduction in wilderness permit quotas; elimination of bicycle rentals, commercial rafting, stock use, golf, tennis, and swimming pools; elimination of most nonriver-related visitor services; a 43% reduction in lodging and 8% reduction in camping; and an overall reduction in peak day use levels (PAOT) within the corridor by 12%. These actions would improve the experience of visitors once they were within the Merced River corridor as a result of less congestion, but would also result in many people being unable to gain access to the East Valley via private vehicle and the experiences it provides. Because there will be a reduction in the total number of visitors, these visitors would overall experience less crowding and enjoy a more natural, restored landscape. Overall, with implementation of mitigation measure MM-VEX-1 and MM-VEX-2, as appropriate (see Appendix C); these actions would result in a corridorwide, long-term, minor beneficial impact on access to and availability of recreation and visitor services and the overall quality of the visitor experience.

## **Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions under Alternative 2. The projects identified below include only those that could affect visitor experience within the Merced River corridor or in the park vicinity.

### ***Past Actions***

*The General Management Plan for Yosemite National Park (1980).* This plan is the basic document for management of Yosemite National Park. The *Merced River Plan/EIS* would amend the *General Management Plan* to meet the mandates of the Wild and Scenic Rivers Act.

*The Concession Services Plan (1992).* This is the 1992 amendment to the General Management Plan that guides the management of concession enterprises such as lodging, food, retail and other commercial services in Yosemite National Park. The plan serves as the basis for contracts between the national Park Service and the park's primary concessioner. The *Merced River Plan/EIS* would amend the *Concession Services Plan* to meet the mandates of the Wild and Scenic Rivers Act.

### ***Present Actions***

Projects currently underway that may have an effect on the visitor facilities and services and the visitor experience include the following plans, projects, and assessments.

- *Yosemite Wilderness Stewardship Plan/EIS.* This plan utilizes direction from the *Merced River Plan* to address the Merced River corridor component of this plan. Alternative 2 removes the Merced Lake High Sierra Camp and wilderness camping areas and facilities that would allow for including the current nonwilderness inholding to be designated as wilderness.
- *Tuolumne Wild and Scenic River Comprehensive Management Plan.* The Tuolumne River Plan would establish long-term guidance for protecting water quality, free-flowing condition, and unique values for the portion of the Tuolumne River that flows through the park.
- *Scenic Vista Management Plan: Environmental Assessment.* This plan protects Yosemite's views and vistas, part of the overall visitor experience. Actions set forth in this plan amend the *Scenic Vista Management Plan*.
- *Mariposa Grove Restoration Plan.* Decisions made in this plan are expected to help manage visitor crowding and congestion in Wawona.
- *Half Dome Trail Stewardship Plan.* This plan addresses wilderness character on this trail and may affect use patterns along trails between Happy Isles and Little Yosemite Valley.
- *Ahwahnee Comprehensive Rehabilitation Plan.* This plan improves visitor facilities and services at The Ahwahnee. Alternative 2 proposes removal of some facilities and services at The Ahwahnee.
- *Ansel Adams Gallery Rehabilitation Plan.* This plan improves a visitor-serving facility.

- *Comprehensive Interpretive Plan.* This plan outlines a comprehensive approach to interpreting park natural and cultural resources and guides interpretive and educational efforts for the next five to 10 years. The significant number of restoration activities and associated interpretation and education actions under Alternative 2 would need to be considered as this plan is further developed.
- *Curry Village Rock Fall Hazard Zone Structures Project.* This plan addresses the structures within this zone. The outcome of this plan would affect lodging in this area. Alternative 2 removes structures from the rock fall hazard zone.
- *Yosemite Environmental Education Campus* NatureBridge and the NPS will be constructing a new education center at Henness Ridge (and restoring the Crane Flat campus to natural conditions)

### **Overall Cumulative Impact from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

The cumulative impacts of Alternative 2 management measures for visitor experience and recreation would generally be beneficial for Segments 1–8. Past and present facilities improvements and upgrades would enhance the visitor experience and reduce demand on park facilities. Visitors would also benefit from past and present habitat restoration and resource management projects and plans. As a result, the cumulative impact of Alternative 2 management measures, in light of past, present, and reasonably foreseeable future projects, would be parkwide, long term, moderate, and beneficial.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **Segmentwide**

##### ***Impacts of Actions to Protect and Enhance River Values***

With the exception of the corridorwide actions common to Alternatives 2–6, there would be no additional corridorwide actions under Alternative 3 to protect and enhance river values.

#### **Segment 1: Merced River Above Nevada Fall**

With the exception of the actions common to Alternatives 2–6, there would be no additional actions under Alternative 3 to protect and enhance river values in Segment 1.

##### ***Impacts of Actions to Manage User Capacity and Facilities***

**Merced Lake High Sierra Camp.** Under Alternative 3, Merced Lake High Sierra Camp would be converted to a temporary outfitter camp providing lodging for 15 people. This would reduce lodging in Segment 1 in Alternative 3 by 75%. The Merced Lake High Sierra Camp and all related infrastructure would be removed and the area would be designated as wilderness. This would create an experience where visitors are self-reliant and the landscape is natural and undeveloped. For visitors who desire this type of experience, changing the camp to a temporary outfitters camp would be

beneficial; however, there are many visitors for whom the Merced Lake High Sierra Camp defines the quality of their recreational experience. Some have been visiting the High Sierra Camps for generations. Others support the potential Historic District designation of the High Sierra Camp, believing it is a cultural resource from the early days of the park. For these visitors, the conversion of the camp to a temporary outfitters camp would have an adverse effect on their experience, both in the wilderness and generally in Yosemite.

**Camping.** Under Alternative 3, all designated camping in Segment 1 would be converted to dispersed camping. With the conversion to dispersed camping, visitors have the opportunity to camp out of sight and sound from other campers. Dispersed camping and minimal facilities are in keeping with the undeveloped quality of the wilderness. Visitors seeking a true wilderness experience would benefit from these changes. Visitors who value less crowded areas, but still appreciate organized camping and minor facilities, may have a somewhat less positive visitor experience owing to the increase in dispersed camping and removal of facilities.

**Wilderness Capacity.** Under Alternative 3, the capacity of the Little Yosemite Valley Wilderness Zone would be reduced from existing levels by 50%, from 150 to 75 overnight visitors per day. This would improve the solitary nature of wilderness camping due to the reduced number of people but because zone capacity and wilderness permit numbers are related, this would result in increased difficulty gaining access to the wilderness.

**Overnight Use.** Wilderness Zone capacities in Segment 1 would be reduced from 380 people under Alternative 1 (No Action) to 260 under Alternative 3, a reduction of 32%. The number of day visitors would remain at 350. This decrease in zone capacity would reduce the number of encounters with other visitors and increase the experience of solitude in the wilderness. The importance of these two factors varies according to visitor. For some, the reduction in activity and visitation would be beneficial; others would be less concerned with these issues because they experience the wilderness as already uncrowded.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, moderate, adverse impacts on visitor experience and recreation within Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Alternative 3 would restore more than 300 acres of meadow and riparian habitat throughout the Merced River corridor. This is not as significant as the restoration of 347 acres under Alternative 2; however, visitors would still notice the improved condition of the natural environment, including the removal of structures and facilities within the floodplain, restoration of riverbanks and meadows, removal of bridges, and an overall improvement in the functioning of the river.

Under Alternative 3, restoration activities would be similar to, but not as extensive as, those proposed under Alternative 2. As under Alternative 2, certain projects, such as restoration of areas from which Yosemite Lodge development was previously removed due to flood damage would proceed. Many

familiar signs of human use and activity would be removed to accommodate floodplain and meadow restoration. Visitor impacts would be similar to Alternative 2; however, campsites would be removed from within 150 feet of the ordinary high-water mark instead of from the 100-year floodplain. This would result in the removal of fewer campsites for restoration purposes. Extensive restoration would have a number of impacts on the visitor experience, and the impacts would differ depending on the perspective of visitors. As under Alternative 2, regardless of the visitor, the scale of restoration proposed under Alternative 3, in combination with the actions common to Alternatives 2–6, would result in a physically altered Yosemite Valley. There would be fewer roads, trails, buildings, and bridges, and noticeably more relatively undisturbed natural areas. Those visitors who value an ecosystem with less human-made features and disturbances would find their experience very positive. Those visitors who have grown accustomed to more development might miss activities in which they have participated in the past, such as stock use, staying at Yosemite Lodge, and camping adjacent to the Merced River. These visitors might also be negatively affected by the diminishments of the relative freedom provided under Alternative 1, in terms of river access and areas to recreate.

The interpretive and educational opportunities associated with this scale of restoration would explain these landscape-level changes to visitors. Education would benefit all visitors but would especially help those who do not understand why the appearance of the valley has changed and who may feel that certain aspects of the Yosemite they used to know and activities in which they had once participated have either disappeared or become less available.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 3 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; and removing campsites and infrastructure from the 100-year floodplain and restoring 12 acres of floodplain and riparian habitat; and erecting fencing and signage to redirect visitor traffic, and removing informal trails at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks.

These projects would have significant short-term impacts on the visitor experience by limiting visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. The larger the project in size and the longer its duration, the greater the impact on the visitor. In certain circumstances, restoration activities, although beneficial to the resource, may alter the visitor's experience by limiting direct interaction with natural resources (e.g. touching versus seeing). Generally, increased visitor use results in greater restrictions in order to protect the resource and therefore would have a short-term, minor, adverse impact on visitor experience. Visitor experience benefits include opportunity for education and interpretation of restoration action. In the long-term, the results of these actions would improve natural resources and hydrologic function and would have moderate beneficial impact on visitor experience.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 3 include: relocating unimproved Camp 6 parking; removing the Stoneman, Ahwahnee and Sugar Pine Bridges;



and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise, and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

### ***Impacts of Actions to Manage User Capacity and Facilities***

**Visitor Use Levels.** Under Alternative 3, visitors would experience the least crowding of any alternative, as peak day use levels would decrease by 24%, from 8,272 to 6,289; while maximum overnight capacity would fall 23%, from 6,564 to 5,027. Based on monthly visitation statistics, this projected reduction would be more consistent with current visitation in early summer. As a result the visitors at this time would experience less crowding than is normal today in peak months, although nothing like the winter visitation experience, which has approximately 87% less visitors than the peak.

**Day Use Management.** The day-use management system would have the same impacts on visitors as that under Alternative 2 — a reduction in crowding, congestion and resource damage. However, demand is likely to significantly exceed supply during peak season, resulting in many dissatisfied individuals unable to access the park. Implementing the permit system, among other transportation-related management measures, would benefit the experience of those visitors who are able to secure a permit because the valley would experience much less crowding and traffic congestion during peak season.

**Overnight Accommodations.** Total camping would increase by 2% in Segment 2, from the 466 existing campsites to a total of 477 campsites. Lodging would decrease by 40%, from 1,034 rooms to 621 rooms. Most notable among the overnight accommodations removed would be Housekeeping Camp and 42% of the units at Yosemite Lodge. Demand for both camping and overnight lodging, which currently exceeds supply, would be exacerbated by this reduction and visitors would find it more difficult to secure a place to stay within the park.

**Parking.** Day parking would be reduced from 2,337 spaces to 1,597 spaces, a 32% decrease. The reduction in day visitors, coupled with increased transportation options during peak months, would make finding parking much easier and reduce congestion and crowding significantly.

**Recreation Facilities.** Developed facilities removed under Alternative 3, in addition to those removed under the actions common to Alternatives 2–6, would include all facilities related to Housekeeping Camp. The Curry Village stables and the Yosemite Lodge Gift Shop would be reduced in size. Although not as extensive as the changes to commercial facilities and services proposed in Alternative 2, these reductions would help reduce the commercial nature of the valley and focus on activities and visitor services that are nature based, but would limit access to and availability of a number of types of visitor facilities and services.

**Boating.** Boat rentals would be discontinued under Alternative 3 in favor of private boating, which would be limited to 50 trips per day (twice as many trips as under Alternative 2), with designated put-in and take-out locations. This would significantly reduce access to boating in Segment 2 and affect those

visitors who come to Yosemite regularly to participate in water activities. The limit on the number of trips per day would further reduce the opportunity to participate. With limited put-in and take-out locations, which are also day use areas, there could be some crowding.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.

### **Segment 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

In addition to the actions common to Alternatives 2–6 in Segments 3 and 4, additional actions would improve and protect the oak habitat in Segment 4 which would improve the natural resources in this area and have a local, long-term, negligible beneficial effect on the visitor experience.

#### ***Impacts of Actions to Manage User Capacity and Facilities***

**Boating.** Alternative 3 would implement boating restrictions in Segments 3 and 4, limiting put-in and take-out locations as well as the number of boats per day. This would reduce the ability of visitors to casually boat on the Merced River.

**Parking Capacity.** The day parking capacity would be the same as under Alternative 1 (No Action), with 180 spaces in Segment 3 and 214 spaces in Segment 4. Parking is not likely an issue for visitors in these segments.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

No additional resource protection actions, aside from those described as common to Alternatives 2–6, would occur in Segments 5, 6, 7 and 8 under Alternative 3.

#### ***Impacts of Actions to Manage User Capacity and Facilities***

This area includes wilderness (Segments 5 and 8), the Wawona Impoundment (Segment 6), and Wawona (Segment 7). Segments 5 and 8 are remote and undisturbed, and resource quality is high in these segments due to very low use levels. There are no developed activities or facilities in Segments 5 and 8. Segment 6, the Wawona Impoundment, is off limits to visitors owing to safety and water quality concerns.

In keeping with the restoration theme of Alternative 3, 27 campsites would be removed from within 150-feet of the river, reducing the number of campsites by 28% from under Alternative 1. Visitors who value improved resource conditions would find removal of these campsites beneficial to their experience and in keeping with this restoration-intensive alternative. Removal of these campsites would have an adverse impact on the experience of those visitors for whom camping close to the South Fork Merced River is an important part of their experience of Yosemite.

**Recreation Facilities.** Under Alternative 3, visitors would experience a reduction in the number of facilities and services available to them, including golf, tennis, and riding. Most noticeably, the Wawona Golf Course and golf shop would be removed under Alternative 3 and the site restored. This would eliminate golfing in the South Fork Merced River corridor. This action would negatively affect visitors for whom golf is an important part of their experience. For those visitors who do not golf or feel golf is an inappropriate activity so close to the river, the removal of this facility and the restoration of the site would be a benefit.

Removal of the Wawona tennis courts would eliminate tennis as a recreational activity in the South Fork Merced River corridor. This might prove to be a disappointment to the hotel visitors who seek out tennis as part of their Yosemite experience. However, this likely would involve a small number of guests. For most guests, the removal of tennis would have no effect on their experience in Wawona, and in the long run the removal might improve their experience by affording them more nature-based, river-dependent activities.

Removal of the Wawona stables would completely eliminate this type of recreation activity from Segment 7. For visitors who participate in day rides, this action would negatively affect their experience. However, a limited number of visitors participate in this activity, so its removal would not affect most visitors in Wawona.

**Boating.** Boating would be allowed in Segment 7, but regulations would limit put-in and take-out sites with no limits on the number of rafts. Not limiting the number of rafts would be beneficial to boaters because they would continue to have access to the same level of boating as they would under Alternative 1.

**Overnight Accommodations.** The number of overnight lodging units at the Wawona Hotel would remain the same as under Alternative 1. Demand for overnight reservations would continue to exceed demand throughout the season. The removal of 27 sites from the Wawona Campground would result in a 28% reduction in the number of campsites. Demand frequently exceeds supply at this campground and removal of these sites, coupled with visitation levels that are unchanged from under Alternative 1, would exacerbate this problem.

**Parking.** Total parking spaces in Wawona would remain at 290 spaces. This number is currently inadequate during peak times, and visitors would continue to experience crowding and congestion as they search for parking.

**Total Visitation.** Unlike Yosemite Valley under Alternative 1, which would experience noticeably less visitor use under Alternative 3, this area would still be crowded during peak times, lessening the visitor

experience. Peak day use levels (PAOT) would increase over that of Alternative 1, from 1,295 to 1,321, primarily due to increased transit use.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The focus of Alternative 3 is on dispersed visitor experiences and extensive riverbank restoration. After Alternative 2, Alternative 3 is the most restoration-intensive of Alternatives 2–6. Visitors would experience fewer roads, trails, buildings, and bridges, and noticeably more relatively undisturbed natural areas. In general, restoration actions improve the quality of natural resources and thus the overall visitor experience. However, under Alternative 3, the extent of the restoration actions, a total of 302 acres in addition to those restoration actions common to Alternatives 2–6, although highly beneficial to resource conditions and river function, would noticeably reduce access to and availability of recreation and visitor services, and the overall visitor experience. Actions under Alternative 3 generally eliminate recreational activities that are not directly resource based including conversion of Merced Lake High Sierra Camp to a temporary pack camp; a capacity reduction of 50% in the Little Yosemite Valley Wilderness Zone and associated reduction in number of wilderness permits issued; elimination of bicycle rentals, commercial rafting, stock use, golf, tennis, and swimming pools; elimination of most nonriver-related visitor services; a 35% reduction in lodging and 3% reduction in camping; and an overall reduction in people in the corridor at one time during peak days by 12%. Parking capacity would be reduced by 19% and, within East Yosemite Valley, private vehicle access managed by a day use permit parking system. These actions would improve the experience of visitors once they were within the Merced River corridor owing to less crowding and congestion, and would also address the demand for more camping in the valley. However, a significant number of visitors would be unable to gain access to the East Valley via private vehicle and the experiences it provides.

Due to the improved condition of natural resources and acreage of restored areas; elimination of a number of non-river-related based activities; a reduced development footprint; an increase in camping and limits on the number of visitors, this alternative would result in a corridorwide, long-term, minor to moderate, beneficial impact on access to and availability of recreation and visitor services and the overall quality of the visitor experience.

These actions would improve the experience of visitors once they were within the Merced River corridor owing to much less crowding and congestion, but would result in many people being unable to gain access to the East Valley via private vehicle and the experiences it provides. Overall, with implementation of mitigation measure MM-VEX-1 and MM-VEX-2, as appropriate (see Appendix C), these actions would result in a corridorwide, long-term, major, adverse impact on access to and availability of recreation and visitor services and the overall quality of the visitor experience.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions under Alternative 3. Cumulatively considerable projects would be the same as those identified for Alternative 2, and include only those that could affect visitor experience within the Merced River corridor or in the park vicinity.

#### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

The cumulative impacts of Alternative 3 management measures on visitor experience would generally be beneficial in Segments 1–8. Past and present visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans. As a result, the cumulative impact of Alternative 3 management measures, in light of past, present, and reasonably foreseeable future projects, would be parkwide, long term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

#### ***Corridorwide***

##### ***Impacts of Actions to Protect and Enhance River Values***

With the exception of the corridorwide actions common to Alternatives 2–6, there would be no additional actions corridorwide actions under Alternative 4 to protect and enhance river values.

#### **Segment 1: Merced River above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

With the exception of actions common to Alternatives 2–6, there are no additional actions proposed under Alternative 4 to protect and enhance river values in Segment 1.

##### ***Impacts of Actions to Manage User Capacity and Facilities***

**Merced Lake High Sierra Camp.** The removal of Merced Lake High Sierra Camp would eliminate overnight lodging in Segment 1. The camp and all related infrastructure would be removed and the camp would be designated as wilderness. This would create an experience where visitors are self-reliant and the landscape is natural and undeveloped. For visitors who desire this type of experience, the removal of the camp would be beneficial; however, there are many visitors for whom the Merced Lake High Sierra Camp defines the quality of their recreational experience. Some have been visiting

this High Sierra Camp for generations. Others support the potential Historic District designation of the High Sierra Camp, believing it is a cultural resource from the early days of the park. For these visitors, the closure of the Merced Lake High Sierra Camp would have an adverse effect on their experience, both in the wilderness and generally in Yosemite.

**Camping.** Under Alternative 4, designated camping would remain at Moraine Dome. Designated camping at Merced Lake Backpackers Camping Area would be expanded into the High Sierra Camp site, facilities would be removed, and a composting toilet would be added. At Little Yosemite Valley Backpacker's Camping Area, designated camping would remain, facilities would be removed, and a composting toilet would be added. For those visitors seeking a pristine wilderness experience, the removal of the High Sierra Camp would be beneficial; however, the retention of designated camping may not be in keeping with the wilderness experience they are seeking. The retention of designated camping would benefit those visitors who seek the quiet and solitude of the wilderness but prefer designated camping and toilet facilities.

**Wilderness Capacity.** Wilderness Zone capacities in Segment 1 would be reduced from 380 people under Alternative 1 (No Action) to 270 under Alternative 3, a reduction of 29%. The number of day visitors would remain at 350. This would improve the solitary nature of wilderness camping owing to the reduced number of people but because zone capacity and wilderness permit numbers are related, this would make it increasingly difficult for visitors to gain overnight access to the wilderness.

This decrease in overnight visitors would reduce the number of encounters with other visitors and increase the experience of solitude in the wilderness. The reduction in activity and visitation would be beneficial to some visitors while others would be less concerned with these issues because they experience the wilderness as already uncrowded.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, moderate, adverse impacts on visitor experience and recreation within Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, visitors would experience restoration of approximately 223 acres of meadow and riparian habitat in the Merced River corridor. Coupled with the restoration actions common to Alternatives 2–6, these improvements would result in noticeable improvement to the resources over that of Alternative 1. Many of the areas proposed for restoration under Alternatives 2 and 3 would be addressed but with somewhat less intensity. Under Alternative 4, Stoneman Bridge would not be removed but its impact on river flows would be mitigated. Some restoration of Ahwahnee, El Capitan, and Stoneman meadows would occur, but not to the levels proposed in Alternatives 2 and 3. As under Alternative 3, campsites and infrastructure would be removed from within 150 feet of the ordinary high-water mark and these areas restored, as would be the area from which Yosemite Lodge development was previously removed due to flood damage. The present-day Yosemite Lodge would remain under Alternative 4, as would a portion of the units at Housekeeping Camp.

Projects proposed in Segment 2 to protect and enhance river values involve rerouting and revegetating a portion of the Valley Loop Trail. This would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 4 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing campsites and infrastructure from the 100-year floodplain and restoring 12 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails at El Capitan Meadow. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 4 include: relocating unimproved Camp 6 parking; placing large wood and constructed logjams along the base of Stoneman Bridge; removing the Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

**Visitor Use Levels.** Under Alternative 4, visitors would generally experience reduced crowding in Segment 2 because peak day use levels would decrease by 9%, from 8,272 to 7,554 people at one time. However, maximum overnight capacity would increase by 10%, from 6,564 to 7,224 people per night. Visitors would experience less crowding than under Alternative 1 owing to this reduction. Visitor use would be managed through an East Valley day use parking permit system. Once the Yosemite Valley parking capacity was reached, visitors would be directed to remote parking in the Gateway communities and instructed to take public transportation, which would be expanded under Alternative 4 to meet the increase in visitors. As discussed in Alternatives 2 and 3, reducing the number of visitors would improve the visitor experience for those who are able to access the park. For those who cannot gain access, the quality of their experience would be diminished.

**Camping and Lodging.** Camping opportunities in Yosemite Valley would increase 50%, from 466 sites to 701 sites. This is a significant increase in camping and would help to meet the current demand

for camping in the valley. An increase in camping would provide the opportunity for many more visitors to stay overnight in the valley relatively inexpensively. Lodging would decrease 24%, from 1034 units to 823 units. Overall, overnight accommodations would increase 7% under Alternative 4. It is likely that demand for overnight accommodations of all types would continue to exceed supply.

Additional facilities removed under Alternative 4 would include the Curry Village stables; the Nature Shop, and the Housekeeping Camp grocery store. Facilities reduced in size include the Yosemite Lodge Gift Shop. Picnic areas would be added in various locations throughout the valley. Although not as extensive as the changes to commercial facilities and services proposed under Alternatives 2 and 3, these reductions would help reduce the commercial nature of the valley and focus on activities and visitor services that are nature based, but would limit access to and availability of a number of types of visitor facilities and services.

**Boating.** Both private and commercial boating would be allowed in Segment 2. Up to 100 trips per day would be allowed by permit, and put-ins and take-outs would be limited. Commercial boating would be allowed with a staging area at Housekeeping Camp. Commercial trips would be limited to 75 boats at one time or approximately 200 trips per day. The addition of commercial rafting with some restrictions would add a type of activity that is not proposed under Alternatives 2 and 3. Restricting numbers of boats and put-in and take-out locations reduces trampling and erosion and helps protect natural resources.

**Parking.** Day parking would be reduced by 12%, from 2,337 to 2,045 visitor parking spaces available in the valley (a reduction of 292 spaces). Coupled with the day-use management system (which would limit the number of day visitors), expanded bus service, roadway alignment and intersection performance, and new remote parking in El Portal, Alternative 4 would improve the visitor experience by lessening congestion and the time required to look for parking. Visitor/vehicular use conflicts would be mitigated and traffic congestion further reduced with the provision of an underpass at Yosemite Lodge. This would also improve pedestrian safety and the overall visitor experience around Yosemite Lodge.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.

### **Segment 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

In addition to the actions common to Alternatives 2–6 in Segments 3 and 4, additional actions would improve and protect the oak habitat in Segment 3 which would improve the natural resources in this area and have a local, long-term, negligible beneficial effect on the visitor experience.



### ***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

**Boating.** Alternative 4 would implement boating restrictions in Segments 3 and 4, limiting put-in and take-out locations and the number of boats per day to 10 per segment. This would reduce the ability of visitors to casually boat on the river.

**Parking.** The day parking capacity would be the same as under Alternative 1, with 180 spaces in Segment 3 and 214 spaces in Segment 4. Parking is not likely an issue for visitors in these segments. Under Alternative 4, the number of visitors passing through Segments 3 and 4 would decrease from under Alternative 1; however, those recreating in Segment 3 and 4 are expected to remain constant with no change from Alternative 1.

Alternative 4 would add a 200-vehicle parking lot in El Portal, which would provide remote parking for valley visitors. This would be a valuable addition for those visitors who prefer to avoid the lines and permits required to access the valley, but it would not affect those who choose to recreate in Segments 3 and 4.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

In addition to the resource actions common to Alternatives 2–6, 27 sites would be removed from the Wawona Campground to protect cultural resources and the 100-foot riparian buffer. Visitors who value improved resource conditions would find removal of these campsites beneficial to their experience and in keeping with this restoration-intensive alternative. Removal of these campsites would have a negative impact on the experience of those visitors for whom camping close to the South Fork Merced River is an important part of their experience of Yosemite.

#### ***Impacts of Actions to Manage User Capacity and Facilities***

**Recreation Facilities.** The Wawona Golf Course, golf shop, and tennis courts would be retained under Alternative 4. This would be a beneficial decision for the relatively small number of golfers and tennis players, but an adverse impact on those who believe that golf is an inappropriate activity so close to the South Fork Merced River. For most guests, the availability of tennis and golf does not have an effect on their visitor experience. The retention of these facilities is not in keeping with a visitor experience characterized by nature-based, river-dependent activities.

Removal of the Wawona stables would completely eliminate this type of recreation activity from Segment 7. For visitors who participate in day rides, this action would adversely affect their visitor experience. However, a limited number of visitors participate in this activity, so its removal would not affect most visitors to Wawona.

**Boating.** Boating would be allowed in Segment 7, but regulations would limit put-in and take-out sites and the number of boats to five. This would adversely affect those visitors who are accustomed to unrestricted boating access.

**Overnight Accommodations.** The number of overnight lodging units at the Wawona Hotel would remain the same as under Alternative 1. Demand for overnight reservations would continue to exceed demand throughout the season. The removal of 27 sites from the Wawona Campground would result in a 28% reduction in the number of campsites. Demand frequently exceeds supply at this campground and removal of these sites, coupled with visitation levels that are equal to the current levels, would exacerbate this problem.

**Parking.** Total parking spaces in Wawona would remain at 290 spaces. This number is currently inadequate during peak times, and visitors would continue to experience crowding and congestion as they search for parking.

**Total Visitation.** The total number of visitors to Segment 7 under Alternative 4 is expected to be the same as under Alternative 1. Crowding and congestion occur in Wawona and along the river during peak times and this would continue. Peak day use levels (PAOT) would increase over that of Alternative 1, from 1,295 to 1,399, primarily due to increased transit use.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The focus of Alternative 4 is on resource-based visitor experiences and targeted riverbank restoration. Alternative 4 strikes a balance between restoration and visitor use. Under Alternative 4, the extent of restoration actions would be 223 acres, in addition to those restoration actions common to Alternatives 2–6. Restoration activities would be noticeable to visitors but less extensive than the restoration proposed under Alternatives 2 and 3. In general, restoration actions improve the quality of natural resources and hydrologic function of the river and thus the overall quality visitor experience.

Actions under Alternative 4 generally reduce recreational activities that are not directly resource based. These actions would include removal of Merced Lake High Sierra Camp; a capacity reduction of 33% in the Little Yosemite Valley Wilderness Zone and associated reduction in number of wilderness permits issued; elimination of bicycle rentals, stock use, and swimming pools; elimination of most nonriver-related visitor services; a 20% reduction in lodging and 37% increase in camping; and an overall reduction in peak day use levels (PAOT) within the corridor by 5%. Commercial boating in the valley would be allowed under Alternative 4, a pedestrian underpass would be added at Yosemite Lodge, and a remote parking lot would be added in El Portal to reduce congestion in the valley. Visitor use in Yosemite Valley would be reduced by 17% and access controlled by an East Valley day use parking permit system. Once maximum parking capacity in the valley was reached, access would be limited to overflow parking. These actions would improve the experience of visitors once they were within the Merced River corridor owing to less crowding and congestion, and would also address the

demand for more camping in the valley. However, some visitors would be unable to gain access to the East Valley via private vehicle and the experiences it provides.

Due to the improved condition of natural resources and acreage of restored areas; elimination of a number of non-river-related based activities; a reduced development footprint; an increase in camping and limits on the number of visitors; and with implementation of mitigation measure MM-VEX-1 and MM-VEX-2, as appropriate (see Appendix C), this alternative would result in a corridorwide, long-term, minor to moderate, beneficial impact on access to and availability of recreation and visitor services and the overall quality of the visitor experience.

### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions proposed under Alternative 4. Cumulatively considerable projects would be the same as those identified for Alternative 2, and include only those that could affect visitor experience within the Merced River corridor or in the park vicinity.

#### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

The cumulative impacts of Alternative 4 management measures on visitor experience would generally be beneficial in Segments 1–8. Past and present visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans. As a result, the cumulative impact of Alternative 4 management measures, in light of past, present, and reasonably foreseeable future projects, would be parkwide, long term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### ***Corridorwide***

#### ***Impacts of Actions to Protect and Enhance River Values***

With the exception of the corridorwide actions common to Alternatives 2–6, there would be no additional actions corridorwide actions under Alternative 5 to protect and enhance river values.

#### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

With the exception of the actions common to Alternatives 2–6, there would be no additional actions under Alternative 5 to protect and enhance river values in Segment 1.

*Impacts of Actions to Manage User Capacity, Land Use and Facilities*

**Merced Lake High Sierra Camp.** Visitors to Segment 1 would continue to have a wilderness-oriented experience, characterized by self-reliance and opportunities for solitude. The Merced Lake High Sierra Camp would be reduced by 40%, from 60 beds to 42. This would make the Camp equal in size to other High Sierra Camps. Composting toilets will be installed in this location. This size reduction would be beneficial to the experience of some visitors as it would retain the historical use and provide a different type of accommodation for visitors. The reduction in the size of the camp and removal of the water treatment plant, although not as desirable as eliminating the entire camp to those who oppose it, would reduce the impact of this developed facility on the wilderness landscape.

**Camping and Lodging.** Little Yosemite Valley Backpacker's, Moraine Dome, and the Merced Lake Backpackers camping areas would remain as designated camping areas under Alternative 5, with maximum overnight visitation set by zone capacity, or 150 for the LYV Zone and 50 for the Merced Lake Zone. Merced Lake Backpacker's Camping Area would replace the existing wastewater system with composting toilets. Little Yosemite Backpacker's Camping Area would retain the existing facilities, including restrooms. Moraine Dome would continue to have no facilities. Backpackers could also continue to camp away from the Merced River in dispersed sites. Some visitors would experience crowding and an unacceptable number of visitor encounters, which would impinge on the solitude they desire in the wilderness. Others would perceive the number of overnight visitors in this Segment 1 as low and benefit from the opportunity to experience camping in the relatively uncrowded wilderness. Retention of designated campsites would be beneficial to those visitors who value minimal facilities as part of their wilderness experience. Some visitors, desiring a more primitive wilderness experience, would experience the designated camping areas and facilities as contrary to the wilderness experience.

**Boating.** Allowed as an activity in Segment 1, under Alternative 5, boating would be limited to five boats per day. This would lessen the visitor experience for those who want to boat in Segment 1 but may improve the experience of those visitors who prefer a wilderness experience with little human-made disturbance.

**Wilderness Capacity.** Wilderness Zone capacities in Segment 1 would be reduced from 380 people under Alternative 1 (No Action) to 362 under Alternative 5, a reduction of 5%. The number of day visitors would remain at 350. As is currently the case, demand for overnight use permits in the wilderness would continue to exceed supply, leaving some visitors unable to secure a permit and thus unable to have the recreational experience they planned at the time they desired. The retention of the existing wilderness capacity would likely have an adverse effect on those individuals who feel the wilderness should be much less crowded, with fewer visitor encounters.

The slight decrease in overnight visitors would reduce the number of encounters with other visitors and increase the experience of solitude in the wilderness. The importance of these two factors varies according to visitor. Some would benefit from the reduction in activity and visitation, while others would be less concerned with these issues, as they experience the wilderness as already uncrowded.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, minor, adverse impacts on visitor experience and recreation within Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, visitors would experience restoration of approximately 197 acres of meadow and riparian habitat in the Merced River corridor. Coupled with the restoration actions common to Alternatives 2–6, these improvements would result in noticeable improvements to the resources over that of Alternative 1. Education and interpretation related to the widespread restoration and enhancement activities in Segment 2 would help visitors understand the changes to the natural landscape, the beneficial effects of restoration to the natural environment and the function of the river, and the techniques used to achieve these changes.

Projects proposed in Segment 2 to protect and enhance river values involve restoring areas from which Yosemite Lodge development was previously removed due to flood damage; and rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities, and the end result of restored natural areas, would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the impacts would be long term and beneficial.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternatives 5 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; reconfiguring the Curry Orchard parking lot; removing campsites and infrastructure from the 100-year floodplain and restoring 6.5 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails at El Capitan Meadow. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 5 include: relocating unimproved Camp 6 parking; removing the Sugar Pine Bridge; placing large wood and constructed logjams along the base of Stoneman Bridge; and improving trail connectivity and routing in the vicinity of the Ahwahnee Bridge. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

***Impacts of Actions to Manage User Capacity, Land Use and Facilities***

Under Alternative 5, actions to manage visitor use and facilities include a day-use traffic management system; additional parking, camping, and overnight accommodations; and a range of activities designed to complement and respect natural resources. Peak day use levels under Alternative 5 would be 8,954 PAOT, an increase of 8% over existing conditions.

**Parking.** The East Valley day use parking permit system proposed under Alternative 5 would manage private automobile access to the East Valley, thereby reducing crowding and congestion in Segment 2 on peak use days. Both regional transit and valley shuttle options would be expanded, and visitors would be encouraged to park outside of the park and take public transit into the valley. Vehicles driving into the valley would be subject to transportation fees, be directed to overflow parking in the West Yosemite Valley, and ultimately need a parking reservation. For some day visitors, taking a shuttle into the park would improve their experience because they would not be subject to transportation fees, parking in remote lots, or parking reservation requirements. For those who either need their vehicle to access camping or overnight lodging or simply want or need to have their vehicle, the East Valley day use parking permit system should improve the experience of driving in the park on peak days.

Day parking would increase by 5%, from 2,337 to 2,448 visitor parking spaces available in the valley, including the addition of a 100-car overflow parking garage in the West Yosemite Valley. This increase, in addition to the East Valley day use parking permit system, would reduce the number of vehicles circulating through the valley looking for parking. Transportation improvements, including a round-about at the intersection of Sentinel Road and Northside Drive, improved roadway alignment and intersection performance, and a pedestrian underpass at Yosemite Lodge, would result in less congestion and enhance pedestrian safety.

Although the total number of daily visitors to the park is only slightly reduced from existing numbers, the implementation of the East Valley day use parking permit system, additional parking spaces, and transportation system improvements would greatly improve the visitor experience. These improvements would lessen traffic jams; ensure that visitors entering the park have a place to park, thus eliminating unnecessary circling; and allow visitors to participate in scenic driving; and get to their ultimate destination sooner.

**Overnight Accommodations.** The amount of overnight lodging would remain essentially the same as existing conditions under Alternative 5, increasing from 1,034 units to 1,053 units. This increase would not meet the demand for overnight lodging during peak months, and some visitors would not be able to reserve lodging at the times they desire.

**Camping.** The number of campsites would increase from 466 to 739 sites, a 59% increase in the number of campsites in Segment 2. In addition to traditional campsites, new walk-in, RV, and groups sites would broaden camping opportunities for visitors. The overall increase would help meet the current unmet demand for campsites.

**Commercial.** Visitor-serving facilities would be reduced in Segment 2 under Alternative 5 and would be focused on serving immediate visitor needs for food and beverages. Grocery stores and dining

facilities would remain at Curry Village, Yosemite Village, Yosemite Lodge, and The Ahwahnee. The grocery store at Housekeeping Camp and some shopping facilities would also be removed. These actions, coupled with the removal of facilities common to Alternatives 2–6, would result in a visitor experience that is less focused on commercial activities. Some visitors would miss the additional opportunities for shopping, eating, and recreating. Others would see the removal of these facilities and services as an action in keeping with enhancing the natural character of the valley.

**Recreational Activities.** A wide variety of nature-based recreational activities, such as hiking, visiting key destinations, contemplation, rafting, and swimming, would continue as an integral part of the visitor experience. These activities are the reason most visitors come to Yosemite and would continue as popular activities. Because the total number of visitors would not noticeably change under Alternative 5, visitors engaged in these activities would likely experience crowded conditions during certain times of day, especially during the peak season.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.

### **Segment 3 and 4: Merced River Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

In addition to the actions common to Alternatives 2–6 in Segments 3 and 4, additional actions would improve and protect the oak habitat in Segment 3 which would improve the natural resources in this area and have a local, long-term, negligible beneficial effect on the visitor experience.

#### *Impacts of Actions to Manage User Capacity, Land Use and Facilities*

**Boating.** Alternative 5 would implement boating restrictions in Segments 3 and 4, limiting put-in and take-out locations and the number of boats per day to 10 per segment. This would reduce the ability of visitors to casually boat on the river.

**Parking.** The day parking capacity would be the same as under Alternative 1, with 180 spaces in Segment 3 and 214 spaces in Segment 4. Parking is not likely an issue for visitors in these segments.

Alternative 5 would add a 200-vehicle parking lot in El Portal, which would provide remote parking for valley visitors. This would be a valuable addition for those visitors who prefer to avoid the lines and permits required to access the valley but would not affect those who choose to recreate in Segments 3 and 4.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.

## Segments 5, 6, 7, and 8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

In addition to the resource actions common to Alternatives 2–6, 27 sites would be removed from the Wawona Campground to protect cultural resources and the 100-foot riparian buffer. Visitors who value improved resource conditions would find removal of these campsites beneficial to their experience and in keeping with this restoration-intensive alternative. Removal of these campsites would have a negative impact on the experience of those visitors for whom camping close to the South Fork Merced River is an important part of their experience of Yosemite.

### *Impacts of Actions to Manage User Capacity and Facilities*

**Recreation Facilities.** The Wawona Golf Course, golf shop, and tennis courts would be retained under Alternative 5. This would be a beneficial decision for the relatively small number of golfers and tennis players, but an adverse impact on those who believe that golf is an inappropriate activity so close to the river. For most guests, tennis and golf do not have an effect on their visitor experience. The retention of these facilities is not in keeping with a visitor experience characterized by nature-based, river-dependent activities.

Removal of the Wawona stables would completely eliminate day rides from Segment 7. For visitors who participate in this activity, this action would negatively affect their visitor experience. However, a limited number of visitors participate in this activity, so its removal would not affect most visitors to Wawona.

**Boating.** Boating would be allowed in Segment 7 but regulations would limit put-in and take-out sites and the number of boats in each segment to five. This would negatively affect those visitors who are accustomed to unrestricted access in this segment.

**Overnight Accommodations.** The number of overnight lodging units at the Wawona Hotel would remain the same as under Alternative 1. Demand for overnight reservations would continue to exceed demand throughout the season. The removal of 13 sites from the Wawona Campground would result in a 14% reduction in the number of campsites. Demand frequently exceeds supply at this campground and removal of these sites, coupled with visitation levels that are equal to the current levels, would exacerbate this problem.

**Parking.** Total parking spaces in Wawona would remain at 290 spaces. This number is currently inadequate during peak times, and visitors would continue to experience crowding and congestion as they search for parking.

**Total Visitation.** Crowding and congestion occur in Wawona and along the South Fork Merced River during peak times and this would continue. Peak day use levels (PAOT) would increase over that of Alternative 1, from 1,295 to 1,606, primarily due to increased transit use.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.



## **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The focus of Alternative 5 is on enhanced visitor experiences and essential riverbank restoration. Alternative 5 strikes a balance between restoration and visitor use and would provide a number of methods to manage crowding and congestion and improve the visitor experience. Restoration activities would be noticeable to visitors but less intense than the restoration proposed under Alternatives 2 and 3. In general, restoration actions improve the quality of natural resources and thus the overall visitor experience. Under Alternative 5, the extent of the restoration actions would be 197 acres, in addition to those restoration actions common to Alternatives 2–6. These actions are highly beneficial to resource conditions and river function and somewhat limit access to and availability of recreation and visitor services, and the overall visitor experience. Actions under Alternative 5 reduce recreational activities that are not directly resource based. These actions would reduce Merced Lake High Sierra Camp by 20%; maintain the current capacity of the Little Yosemite Valley wilderness zone and related wilderness permit numbers; eliminate bicycle rentals, commercial boating, stock use, tennis, and swimming pools; eliminate most nonriver-related visitor services; increase lodging 1% and camping 29%; and increase peak day use levels (PAOT) within the corridor by 9%. A traffic circle and a pedestrian underpass in the valley, as well as remote parking lot, would be added in El Portal to reduce congestion in the valley. Parking capacity would be increased by about 3%. These actions would improve the experience of visitors once they were within the Merced River corridor due to less crowding and congestion, and would also address the demand for more camping in the valley. Alternative 5 would allow access to approximately the same number of visitors as current conditions, but with congestion and crowding controls, most visitors would be able to gain access to the East Valley via private vehicle and the experiences it provides. Overall, with implementation of mitigation measure MM-VEX-1 and MM-VEX-2, as appropriate (see Appendix C), these actions would result in a corridorwide, long-term, minor, beneficial impact on access to and availability of recreation and visitor services and the overall quality of the visitor experience.

## **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions in Alternative 5. Cumulatively considerable projects would be the same as those identified for Alternative 2, and include only those that could affect visitor experience within the Merced River corridor or in the park vicinity.

## ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

The cumulative impacts of Alternative 5 management measures on visitor experience would generally be beneficial in Segments 1–8. Past and present visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans. As a result,

the cumulative impact of Alternative 5 management measures, in light of past, present, and reasonably foreseeable future projects, would be parkwide, long term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### ***Corridorwide***

##### ***Impacts of Actions to Protect and Enhance River Values***

With the exception of the corridorwide actions common to Alternatives 2–6, there would be no additional actions corridorwide actions under Alternative 6 to protect and enhance river values.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

With the exception of the actions common to Alternatives 2–6, there would be no additional actions under Alternative 6 to protect and enhance river values in Segment 1.

##### ***Impacts of Actions to Manage Use and Facilities***

Under Alternative 6, actions to manage visitor use and facilities are similar to Alternative 1 (No Action) and include:

- Retain Merced Lake High Sierra Camp with 60 beds;
- Retain Merced Lake Backpacker's Camping Area for designated camping and replace flush toilets with composting toilets;
- Retain designated camping and infrastructure at Little Yosemite Valley Backpacker's Camping Area;
- Retain designated camping at Moraine Dome;
- Little Yosemite Valley wilderness quota remains at 150 overnight visitors; and
- Increase in total daily visitation to Yosemite Valley of 7%.

**Merced Lake High Sierra Camp.** Visitors to Segment 1 would continue to have a wilderness-oriented experience, characterized by self-reliance and opportunities for solitude. The Merced Lake High Sierra Camp would remain at its present size (60 beds), benefitting the visitor whose values this experience. Those visitors who believe the High Sierra Camp site should be returned to wilderness, with little evidence of human-made facilities, would continue to be dissatisfied with the presence of the High Sierra Camp. The removal of the flush toilets and replacement with composting toilets would reduce the impact of this developed facility on the wilderness landscape.

**Camping and Lodging.** Little Yosemite Valley Backpacker's Camping Area would be reduced. Designated camping would remain at Merced Lake Backpackers Camping Area and composting toilets would be installed. Moraine Dome Camping Area would retain its designated sites and would remain without facilities. Backpackers could also continue to camp away from the Merced River in dispersed sites throughout Segment 1. Some visitors would experience crowding and an unacceptable number of visitor encounters, which would impinge on the solitude they desire in the wilderness. Others would perceive the number of overnight visitors in Segment 1 as low. Retention of designated campsites would be beneficial to those visitors who appreciate minimal facilities as part of their wilderness experience. Some visitors, desiring a more primitive wilderness experience, would experience the designated camping areas and facilities as contrary to the wilderness experience.

**Wilderness Capacity.** Wilderness Zone capacities in Segment 1 would remain at 380 people (as under Alternative 1 (No Action)). The number of day visitors would remain at 350. As is currently the case, demand for overnight use permits in the wilderness would continue to exceed supply, leaving some visitors unable to secure a permit and thus unable to have the recreational experience they planned at the time they desired. However, Alternative 6, like Alternative, 1 would provide for the greatest number of wilderness permits and therefore provide wilderness access to the greatest number of visitors. Maintaining the existing wilderness capacity would likely have an adverse effect on those individuals who feel the wilderness should be much less crowded, with fewer visitor encounters. The number of visitor encounters in the wilderness would remain the highest of any action alternative and reduce opportunities for solitude in the wilderness. Crowding in the wilderness would be similar to present day.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities within Segment 1 would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segment 1.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removing buildings from the Yosemite Lodge area, and rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. These projects would take several weeks to a few months to complete and would likely close these areas to visitors during this time. These actions would have a short term, local, minor adverse impact on the visitor experience due to construction impacts including noise, temporary resource disturbance.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 6 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; reconfiguring the Curry Orchard Parking lot; removing campsites and infrastructure from the 100-year floodplain and restoring 6.5 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails and selectively removing conifers at El Capitan Meadow. These actions would likely limit visitor access while these

areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 6 include: relocating unimproved Camp 6 parking and placing large wood and constructed logjams along the bases of Stoneman, Sugar Pine, and Ahwahnee Bridges. These actions would likely limit visitor access while these areas are being restored. Construction activities resulting in truck congestion, noise and dust would negatively impact the visitor experience. Educating the visitor about ongoing restoration activities would be beneficial to the visitor experience. These actions are local, minor, short-term and adverse. Once these projects are completed, the resulting improvements to natural resources would be long term and beneficial.

### *Impacts of Actions to Manage User Capacity, Land Use and Facilities*

Day use levels and maximum overnight capacities in Segment 2 under Alternative 6 would be the highest of any alternative. Under this alternative, peak day use (PAOT) would increase by 14%, from 8,272 to 9,449; while maximum overnight capacity would increase by 37%, from 6,564 to 9,006 people per night. To help manage this increase in visitation and ease crowding and congestion, a range of transportation management measures, including a possible East Valley day use parking permit system, would be implemented to ease crowding and congestion in Segment 2 on peak use days.

**Transportation.** Both regional transit and valley shuttle options would be expanded and visitors would be encouraged to park outside of the park and take public transit into the valley. Vehicles driving into the valley would be subject to transportation fees, be directed to overflow parking in the West Yosemite Valley, and ultimately require a parking reservation. In Segment 2, there would be a total of 2,598 day use parking spaces, an 11% increase over the spaces currently available. Within the valley, roundabouts would be added to control traffic flow and pedestrian underpasses would be constructed at Camp 6/Yosemite Village and Yosemite Lodge to improve traffic flow and visitor safety. These improvements would lessen traffic jams; assure that visitors entering the park have a place to park, thus eliminating unnecessary circling; and allow visitors to participate in scenic driving free of congestion, and get to their ultimate destination sooner.

For some day visitors, taking a shuttle into the park would improve their experience because they would not be subject to transportation fees, parking in remote lots, or parking reservation requirements. For those who either need their vehicle to access camping or overnight lodging or simply want or need to have their vehicle, the East Valley day use parking permit system would improve the experience of driving in the park on peak days.

**Overnight Accommodations.** The amount of overnight lodging in Segment 2 under Alternative 6 would increase 20% over Alternative 1, from 1,034 units to 1,248 units. This increase would not meet

the demand for overnight lodging during peak months, and some visitors would not be able to reserve lodging at the times they desire.

**Camping.** The number of campsites would increase from 466 to 739 sites, a 59% increase in the number of campsites and the most campsites of any alternative. In addition to traditional campsites, new walk-in, RV, and groups sites would broaden camping opportunities for visitors. The overall increase would help meet the current unmet demand for campsites.

**Commercial.** Visitor-serving facilities would be reduced in Segment 2 under Alternative 6 and would be focused on serving immediate visitor needs for food and beverages. Grocery stores and dining facilities would remain at Curry Village, Yosemite Village, Yosemite Lodge, The Ahwahnee, and Housekeeping Camp. Some retail facilities would also be removed. These actions, coupled with the removal of facilities common to Alternatives 2–6, would result in a visitor experience that is less focused on commercial activities. Some visitors would miss the additional opportunities for shopping, eating, and recreating. Others would see the removal of these facilities and services as an action in keeping with enhancing the natural character of the valley.

**Recreation Facilities.** A wide variety of nature-based recreational activities, such as hiking, visiting key destinations, contemplation, rafting, and swimming, would continue as an integral part of the visitor experience. These activities are the reason most visitors come to Yosemite and would continue to be popular activities. As the total number of visitors increase under Alternative 6, visitors engaged in these activities would likely experience crowded conditions during certain times of day, especially during the peak season.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.

### **Segment 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

In addition to the actions common to Alternatives 2–6 in Segments 3 and 4, additional actions would improve and protect the oak habitat in Segment 3.

#### ***Impacts of Actions to Manage User Capacity and Facilities***

**Boating.** Alternative 6 would implement boating restrictions in Segments 3 and 4, limiting put-in and take-out locations and limiting the number of boats per day to 10 per segment. This would reduce the ability of visitors to casually boat on the Merced River.

**Total Visitors.** Under Alternative 6, the number of visitors passing through Segments 3 and 4 is expected to remain constant with no change from Alternative 1.

**Parking.** The day parking capacity would be the same as under Alternative 1, with 180 spaces in Segment 3 and 214 spaces in Segment 4. Parking is not likely an issue for visitors in these segments. Segments 3 and 4 would continue to be characterized by its scenery, lack of crowds, and variety of water-based recreation opportunities.

Alternative 6 would add a 200-vehicle parking lot in El Portal, which would provide remote parking for valley visitors. This would be a valuable addition for those visitors who prefer to avoid the lines and permits required to access the valley but would not affect those who choose to recreate in Segments 3 and 4.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### *Impacts of Actions to Protect and Enhance River Values*

In addition to the resource actions common to Alternatives 2–6, 13 sites would be removed from the Wawona Campground to protect cultural resources and the 100-foot riparian buffer. Visitors who value improved resource conditions would find removal of these campsites beneficial to their experience and in keeping with this restoration-intensive alternative. Removal of these campsites would have a negative impact on the experience of those visitors for whom camping close to the South Fork Merced River is an important part of their experience of Yosemite.

#### *Impacts of Actions to Manage User Capacity and Facilities*

**Recreation Facilities.** The Wawona Golf Course, golf shop, and tennis courts would be retained under Alternative 6. This is a beneficial decision for the relatively small number of golfers and tennis players, but an adverse impact on those who believe that golf is an inappropriate activity so close to the river. For most guests, tennis and golf do not have an effect on their visitor experience. The retention of these facilities is not in keeping with a visitor experience characterized by nature-based, river-dependent activities.

Removal of the Wawona stables would completely eliminate day rides from Segment 7. For visitors who participate in this activity, this action would negatively affect their visitor experience. However, a limited number of visitors participate in this activity, so its removal would not affect most visitors in Wawona.

**Boating.** Boating would be allowed in Segment 7 but regulations would limit put-in and take-out sites and the number of boats to 10. This would negatively affect those visitors who are accustomed to unrestricted access, though the 10 boat restriction is twice as many boats as allowed under Alternative 5.

**Overnight Accommodations.** The number of overnight lodging units at the Wawona Hotel would remain the same as under Alternative 1. Demand for overnight reservations would continue to exceed

demand throughout the season. The removal of 13 sites from the Wawona Campground would result in a 14% reduction in the number of campsites. Demand frequently exceeds supply at this campground and removal of these sites, coupled with visitation levels that are equal to the current levels, would exacerbate this problem.

**Parking.** Total parking spaces in Wawona would remain at 290 spaces. This number is currently inadequate during peak times, and visitors would continue to experience crowding and congestion as they search for parking.

**Total Visitation.** The total number of visitors to the South Fork Merced River under Alternative 6 is expected to stay the same as under Alternative 1. Crowding and congestion occur in Wawona and along the South Fork Merced River during peak times and this would continue. Peak day use levels (PAOT) would increase over that of Alternative 1, from 1,295 to 1,606, primarily due to increased transit use.

**Segments 5-8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The focus of Alternative 6 is on diversified visitor experiences and selective riverbank restoration. Alternative 6 would achieve this, but not without having some impacts on visitor use and experience. Like Alternative 5, Alternative 6 also attempts to balance restoration and visitor use and provides a number of methods to manage crowding and congestion and improve the visitor experience. Restoration activities would be noticeable to visitors, but less intense than the restoration proposed under other alternatives. In general, restoration actions improve the quality of natural resources and thus the overall visitor experience. Under Alternative 6, the extent of the restoration actions is 170 acres, in addition to those restoration actions that are common to Alternatives 2–6, and presents the least restoration of any action alternative. These actions are highly beneficial to resource conditions and river function and slightly limit access to and availability of recreation and visitor services, and the overall visitor experience.

Actions under Alternative 6 would reduce recreational activities that are not directly resource-based. Under Alternative 6, Merced Lake High Sierra Camp would be retained; Little Yosemite Valley wilderness zone capacity and overnight wilderness permits would remain as under current conditions; bicycle rentals, commercial stock use, tennis, and swimming pool, and most nonriver-related visitor services would be eliminated; lodging would increase 18% and camping 46%; and peak day use levels (PAOT) would increase throughout the corridor by an average of 12%. A roundabout and two pedestrian underpasses in the valley, as well as remote parking lot in El Portal, would be added to address expanded visitation and reduce congestion in the valley. Total parking capacity would increase by 7%. These actions would improve the experience of visitors once they were within the Merced River corridor due to less congestion, and would also address the demand for more camping in the valley. Because Alternative 6 would increase visitor access and add congestion and crowding

controls, more visitors than under current conditions would be able to gain access to the East Valley via private vehicle and the experiences it provides. Overall, with implementation of mitigation measure MM-VEX-1 and MM-VEX-2, as appropriate (see Appendix C), these actions result in a corridorwide, long-term, moderate, adverse impact on access to and availability of recreation and visitor services and the overall quality of the visitor experience.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Cumulative effects on visitor experience as it relates to visitor services are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions under Alternative 6. Cumulatively considerable projects would be the same as those identified for Alternative 2, and include only those that could affect visitor experience within the Merced River corridor or in the park vicinity.

### ***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

The cumulative impacts of Alternative 6 management measures on visitor experience would generally be beneficial in Segments 1–8. Past and present visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans. As a result, the cumulative impact of Alternative 6 management measures, in light of past, present, and reasonably foreseeable future projects, would be parkwide, long term, minor to moderate, and beneficial.



## Wilderness Character

### *Affected Environment*

#### Regulatory Framework

##### *The Wilderness Act of 1964*

The Wilderness Act of 1964 directed the Secretary of the Interior to study federal lands within the National Wildlife Refuge and National Park Systems, and recommend to the president those lands suitable for inclusion in a National Wilderness Preservation System. The Secretary of Agriculture was similarly directed to study and recommend such lands within the National Forest System. The Wilderness Act, which grants Congress final decision-making authority regarding designations, defines wilderness as including the following characteristics:

*...wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation...*

The Wilderness Act prohibits certain uses in designated wilderness including motor vehicles, motorized equipment, landing of aircraft, other forms of mechanized transport, and structures or installations except as necessary to meet the minimum requirements for the administration of the area for the purpose of the Act.

##### *The California Wilderness Act of 1984*

With passage of the Wilderness Act of 1984, the majority of Yosemite National Park was designated as wilderness. Certain other lands, some of which involved uses prohibited under the Wilderness Act of 1964, were identified as potential wilderness additions. According to the act, potential wilderness additions would become designated wilderness upon the Secretary of the Interior's publication in the *Federal Register* of a notice that all prohibited uses have ceased.

##### *Management Policies 2006*

The National Park Service (NPS) *Management Policies 2006* provide guidance to park managers on several wilderness-related topics. These policies specify that the NPS will manage wilderness areas for the physical protection of wilderness resources, but also the preservation of the area's wilderness character. In carrying out these objectives, the superintendent of each park containing wilderness is tasked with developing and maintaining a wilderness management plan to guide the preservation, management, and use of wilderness resources. The plan identifies desired future conditions and

thresholds beyond which management actions will be taken to reduce human impacts on wilderness resources. In Yosemite, wilderness areas are managed under the 1989 *Yosemite Wilderness Management Plan* (described below).

#### ***Director's Order 41: Wilderness Preservation and Management***

Director's Order 41 builds on the wilderness-related policies set forth in the *NPS Management Policies 2006*, providing additional detail and instruction regarding the stewardship of NPS lands designated or having the potential to be designated wilderness. To further wilderness preservation and stewardship objectives, Director's Order 41 approved a wilderness guidance manual (*Reference Manual #41*), established a wilderness stewardship steering committee, and set forth a framework for wilderness stewardship responsibility and accountability. Director's Order 41 also identifies and provides guidance on specific wilderness stewardship issues, such as the types of activities that may or may not be authorized under the Wilderness Act's administrative exception to the general use prohibitions (that is, use of motorized equipment, etc.).

#### ***Yosemite Wilderness Management Plan (1989)***

The Yosemite Wilderness was established by the California Wilderness Act of 1984. The committee report accompanying the 1984 act contains recommendations for managing Yosemite Wilderness regarding operational and environmental impacts. The *Yosemite Wilderness Management Plan* responded to those recommendations in addition to a number of objectives identified through condition reports and other research. In the near future, the NPS anticipates development of *The Yosemite Wilderness Stewardship Plan* and *Yosemite Wilderness Stewardship Plan Environmental Impact Statement* (EIS).

### **Wilderness Character**

In 1964 Congress passed the Wilderness Act, creating the National Wilderness Preservation System, which "secure[d] for the American people an enduring resource of wilderness." In 1984 Congress designated 95% of Yosemite National Park as part of that National Wilderness Preservation System. Many Yosemite visitors travel into the wilderness to seek the beauty, solitude, and challenge that Congress sought to protect with wilderness designation.

The California Wilderness Act of 1984 (Public Law [PL] 98-425) directs the NPS to manage areas designated as wilderness according to provisions of the Wilderness Act of 1964. Although many intangible aspects of wilderness character are important, the NPS (Landres et al. 2008) has identified four qualities that are practical and measurable and rooted in the Wilderness Act. They are:

- **Untrammeled** – Wilderness is essentially unhindered and free from modern human control or manipulation. This quality is diminished by modern human activities or actions that control or manipulate the components or processes of ecological systems inside the wilderness.
- **Natural** – Wilderness ecosystems are substantially free from the effects of modern civilization. This quality is diminished by intended or unintended effects of modern people on the ecological systems inside the wilderness since the area was designated.

- **Undeveloped** – The Wilderness Act states that wilderness is “an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation,” “where man himself is a visitor who does not remain” and “with the imprint of man’s work substantially unnoticeable.” This quality is diminished by the presence of structures, installations, and habitations and by the use of motor vehicles, motorized equipment, or mechanical transport that increases people’s ability to occupy or modify the environment. Development in the wilderness such as trails, designated camping areas, composting toilets and bear boxes is intended, not for the convenience of visitors, but to protect the wilderness character.
- **Solitude or Primitive and Unconfined Recreation** – The Wilderness Act states that wilderness has “outstanding opportunities for solitude or a primitive and unconfined type of recreation.” This quality is about the *opportunity* for people to experience wilderness; it is not directly about visitor experiences in itself. This quality is diminished by settings that reduce these opportunities, such as visitor encounters, signs of modern civilization, recreation facilities, and management restrictions on visitor behavior.

## **Yosemite Wilderness**

Bounded by the Emigrant Wilderness to the north, the Hoover Wilderness to the east, and the Ansel Adams Wilderness to the south, the Yosemite Wilderness encompasses an area totaling 706,624 acres, which is approximately 95% of the total park area. Another 927 acres of the park are identified as potential additions to the Yosemite Wilderness.

In comparison to the non-wilderness areas, there is generally less visitor use in wilderness areas. Wilderness visitation in Yosemite is generally concentrated within a few popular locations, campsites, and trails. The majority of wilderness visitor use occurs within less than 30% of the park’s wilderness areas, with most use distributed along approximately 70 miles of the park’s 800-mile wilderness trail system (Newman 2001). The majority of Yosemite’s trails evolved from travel routes created and used by American Indians, cattle and sheep men, the U. S. Cavalry, and the NPS. As the number of people traveling the trails increased, the NPS responded with increased trail maintenance. In contrast, a small number of trails in Yosemite were created specifically for tourism. These include many of the trails that lead out of Yosemite Valley, as well as the trails that lead up the rocky canyons of both the Merced and Tuolumne Rivers. These routes are in steep, rugged terrain and required prodigious efforts to construct. They contain an immense amount of rock work, and some involved significant blasting of bedrock. These trails provide access to areas that would otherwise be very difficult for most hikers to reach without technical rock climbing or canyoneering skills. It is unlikely that such trail construction would have been allowable had the wilderness designation been in place at the time of trail construction.

In Yosemite, overnight access to the wilderness is controlled by a system of permits and the wilderness trailhead quota system based upon wilderness zones. The wilderness is divided into 53 wilderness travel zones. Zone boundaries are generally based on watershed boundaries. In order to limit use and preserve resource integrity, each zone has a designated carrying capacity based on its physical and ecological factors. Based on the capacity of the zones through which the trail travels, each wilderness trailhead is assigned a numeric quota that equals the number of overnight visitors who can depart from

that trailhead each day. Day users are not included in this quota and are not required to have a permit except to climb Half Dome.

A wilderness permit is required for all groups planning an overnight stay in the wilderness. Permits are given to groups of hikers, with a maximum of 15 hikers in a group. Therefore, a trailhead with a 30 people per day quota could be made up of 2 permits for two groups of 15, 6 permits for six groups of 5, or 15 permits for 15 groups of two. **Table 9-146** indicates overnight visitation in the wilderness from 2006 through 2010. In 2010, the average group size in the wilderness, based upon the data in table 9-146, was 2.9 and the average visit duration was 2.7 nights.

**TABLE 9-146: YOSEMITE WILDERNESS OVERNIGHT VISITOR USE**

	2006	2007	2008	2009	2010
Total Overnight Visitors	40,804	43,401	45,907	52,610	53,139
Total Permits Issued (*)	14,141	15,125	15,156	18,777	18,632
Total Overnight Stays	82,484	112,049	124,817	142,623	142,864
(SOURCE: NPS 2012D)					

In addition, to minimize resource impacts, park wilderness and resource management staff identify and restore areas exhibiting visitor use impacts. Restoration measures include removing illegal and/or excessive campsites, reducing in size certain fire rings and removing associated trash and charcoal, obliterating obsolete or informal trails, and using control measures for non-native vegetation growth.

### *Study Area Wilderness*

Approximately 70% of the Merced River in Yosemite flows through designated wilderness. Within the study area, which extends 1.25 miles on either side of the Merced River, there is a total of approximately 95,980 acres of designated wilderness, approximately 14% of the entire Yosemite Wilderness. There are 141 miles of wilderness trails within the study area.

### *River Corridor Wilderness*

Within the river corridor, there are 18,677 acres of wilderness. Along the river's main stem, the wilderness boundary begins approximately 100 feet upstream of Nevada Fall (in Segment 1). Portions of the South Fork Merced River within the park also flow through wilderness beginning below the Wawona impoundment and extending to the park boundary (Segment 5). The entirety of Segment 1 (12,000 acres) and Segment 5 (5,500 acres) are designated wilderness with the exception of the eight-acre area around Merced Lake High Sierra Camp which is a potential wilderness addition because of its current developed state.

**Table 9-147** indicates the number of acres and percentage of wilderness within those segments containing wilderness and indicates the miles of wilderness trails in each segment. Segment 4 does not contain any designated wilderness. Segment 6 contains the Wawona Impoundment which itself is not located in designated wilderness. However, the lands adjacent to the impoundment within the River

**TABLE 9-147: ACRES OF WILDERNESS IN RIVER CORRIDOR BY SEGMENT**

Segment Number	Total Acres in Segment	Acres of Wilderness in Segment	Percent of Segment in Wilderness	Miles of Trails in Wilderness Portion of Segment
1	12,104	12,104	100%	26.0
2	3,648	667	18%	0.8
3	2,240	61	3%	0.1
5	5,507	5,507	100%	4.1
6	17	15	88%	0.8
7	1,446	323	22%	0
<b>River Corridor Total</b>	<b>24,961</b>	<b>18,677</b>		<b>31.8</b>

Corridor are designated wilderness. This accounts for the wilderness acres in this segment. Segment 8 is not located within designated wilderness and is therefore not subject to the requirements of the Wilderness Act. Although not designated wilderness, Segment 8 is a wild segment of the Merced Wild and Scenic River. Wild segments are "...sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted."

**Trails.** Within the Merced River corridor, wilderness areas above Nevada Fall (Segment 1) have approximately 26 miles of trail, some of which are heavily used. Primary access to this area is provided by the Mist Trail and John Muir Trail, which originate in Yosemite Valley. Wilderness access along the South Fork Merced River (Segment 5), which includes approximately 4 miles of trail, is more limited and is accessed from U.S. Forest Service trailheads that enter the park at Chiquito Pass and Fernandez Pass.

**Wilderness Zones.** The River Corridor contains portions of 15 wilderness zones as indicated in **table 9-148**. Overnight access to the wilderness is controlled by daily visitor quotas established for each wilderness zone.

Segment 1 includes portions of eight different wilderness zones as indicated in **table 9-149** below. The Mist Trail and John Muir Trail, originating within Yosemite Valley, are most commonly used to access the Merced River corridor. The following trailheads originate in Yosemite Valley and provide access to Segment 1. These trailheads are used by 67% of visitors to access Little Yosemite Valley and by 26% of visitors to access Merced Lake. Other trailheads providing access to these areas include those outside the park on Forest Service land and those upstream such as trailheads in Tuolumne Meadows. Yosemite Valley trailheads and their respective overnight quotas are:

- Happy Isles to Sunrise/Merced Lake Pass Thru (no camping in Little Yosemite Valley) – 10
- Happy Isles to Little Yosemite Valley (first night at Little Yosemite Valley camping area) – 30
- Happy Isles to Illilouette – 10
- Glacier Point to Little Yosemite Valley (first night at Little Yosemite Valley camping area) – 10

**TABLE 9-148: WILDERNESS ZONES WITHIN THE RIVER CORRIDOR**

Wilderness Zone #	Wilderness Zone	Acres within the River Corridor
61	Washburn Lake	5,060
50	South Fork Merced River	3,379
58	Clark Range	2,418
60	Merced Lake	2,026
62	Mount Lyell	1,965
52	Chilnualna Creek	1,169
59	Little Yosemite Valley	1,145
51	Johnson Creek	758
47	Half Dome	282
68	Yosemite Creek	187
55	Bridalveil Creek	121
57	Illilouette Creek	70
56	Buena Vista Creek	69
66	Sunrise Creek	16
67	Snow Creek	14
<b>Total Acres Wilderness</b>		<b>18,679</b>

**TABLE 9-149: SEGMENT 1 – WILDERNESS ZONES WITHIN SEGMENT 1**

Wilderness Zone	Acres of Zone in River Corridor	Miles of Trails in Wilderness Zone in River Corridor
Washburn Lake	5,060	11.70
Merced Lake	2,026	7.12
Mount Lyell	1,965	
Clark Range	1,878	2.53
Little Yosemite Valley	1,145	4.50
Sunrise Creek	16	
Half Dome	10	
Illilouette Creek	4	0.14
<b>Wilderness Total</b>	<b>12,104</b>	<b>25.99</b>

In the mid- to late 1990s, the park reduced the number of overnight wilderness visitors from 125 to 75 per day from the four trailheads that provide access to Segment 1 from Yosemite Valley due to an increase in visitors traveling to Little Yosemite Valley from trailheads outside of Yosemite Valley. This reduction kept the overall use of the area within capacity. Table 9-150 shows average 2010 inbound trail use along the Merced River corridor (i.e., hikers traveling from Little Yosemite Valley toward Merced Lake and the wilderness) and indicates that during the 2010 season, an estimated average of 30 trail users per day departed from Little Yosemite Valley toward Merced Lake, for a total of 2,864 hikers.

**TABLE 9-150: TRAIL USE ABOVE LITTLE YOSEMITE VALLEY TO MERCED LAKE (2010)  
(WILDERNESS-BOUND HIKER TRAFFIC)**

Month	Average Daily Use	Total
July	31	952
August	34	1,063
September	23	677
October <sup>a</sup>	10	117
Total Season (July to September)	30	2,864
NOTE: <sup>a</sup> Use counts were taken from October 1 through October 12. SOURCE: NPS 2011h		

Segment 5 includes portions of eight different wilderness zones as indicated in **table 9-151** below. Wilderness trailhead quotas in Segment 5 are Chilnualna Falls trailhead (40), Alder Creek trailhead (15), and Deer Camp trailhead (25) with the majority of access originating on Forest Service land outside of the park. Wilderness trips originating from Wawona in 2010 constituted just 9% of the park's total for that year. With only limited access along the upper reach (Segment 5) it is expected that only a small fraction of these trips occurred within the river corridor.

**TABLE 9-151: SEGMENT 5 – WILDERNESS ZONES WITHIN SEGMENT 5**

Wilderness Zone	Acres of Zone in River Corridor	Miles of Trails in Wilderness Zone in River Corridor
South Fork Merced River	3,379	3.99
Chilnualna Creek	831	
Johnson Creek	758	0.15
Clark Range	539	
<b>Wilderness Total</b>	<b>5,507</b>	<b>4.14</b>

### *Segment 1: Merced River Above Nevada Fall*

**Untrammelled.** Human activities and actions that control or manipulate the components or processes of ecological systems in Segment 1 include the following:

- hazard tree removal at the designated camping areas, ranger stations, and High Sierra Camp
- restoration projects of all types
- diversion of water for the High Sierra Camp, and
- management of lightning-caused fire.

**Natural Condition.** Effects of modern civilization on the ecosystem in Segment 1 include the following:

- climate change
- airborne contaminants
- vegetation changes due to fire suppression
- vegetation damage and soil loss along trails, in designated camping areas and dispersed campsites due to off-trail use and concentrated use
- unburied human waste
- wildlife accustomed to human use
- vegetation damage from meadow grazing by livestock
- trail and meadow damage from stock use
- livestock manure
- litter
- spread of invasive plant, animal, and fungal species

**Undeveloped.** Permanent/semi-permanent improvements or human habitation in Segment 1 include the following:

- Trail signage at various locations.
- Little Yosemite Valley Ranger Station has three canvas-wall tents, an outdoor roofed cooking area, corral, and storage sheds. At any point in time there are two to four rangers, and two or fewer researchers. There are also occasional trail crews ranging in size from five to 15 people.
- Merced Lake Ranger Station - The three—room cabin, constructed in 1927 was originally constructed for winter service in connection with the acquisition of hydrologic data. At this time, cabins are utilized primarily as staging areas and collection points for park backcountry patrol and maintenance projects.
- Three wilderness camping areas located in:
  - Little Yosemite Valley (can accommodate approximately 150 backpackers and has two fire rings, a composting toilet, and bear-proof boxes).
  - Merced Lake (can accommodate approximately 90 backpackers and has a drinking water fountain, two flush toilets, a septic system, and bear-proof boxes).
  - Moraine Dome (can accommodate approximately 50 backpackers and has bear-proof boxes).
- The Merced Lake High Sierra Camp, which accommodates 60 overnight guests and has 22 tents, a kitchen and dining hall, barn, ice house (used for perishable food storage), toilet building with eight water closets, and separate men's and women's shower houses with eight total shower



stalls and eight sinks. The kitchen, ice house, and toilet building are permanent wooden structures built on concrete slabs. The barn is a wooden structure with wood flooring. Canvas tents are used for the guest quarters, shower houses, and dining hall. These tents are erected with steel poles on concrete slabs at the beginning of each season and dismantled at the end of the season. The guest cabins do not have woodstoves, but there is a woodstove in the dining hall. The sewer system consists of a septic tank, lift station (powered by solar panels), dosing tank, leach field, and associated piping. The water system consists of a chlorinator shed, water pump (powered by solar panels), sand filter, three 1,500-gallon tanks, and associated piping. Worth noting is the designation of this site as a potential wilderness addition; however, its presence is noticeable from adjacent designated wilderness areas. Similarly, maintenance and upkeep of the camp, including frequent stock trips and periodic helicopter deliveries and waste removal, have impacts on the character of adjacent wilderness areas.

**Solitude.** Factors that reduce visitors' ability to experience solitude include:

- Number of visitors
- Length of stay
- Group size
- **Visitor Encounters.** The frequency of encounters with other people or groups along trails is commonly used as a proxy to evaluate opportunities for solitude in wilderness settings. Park staff measure encounter rates through actual trail counts or through surveys that ask visitors to estimate the number of other people/groups encountered during hikes. Increased encounters with other parties in the wilderness can diminish the feeling of solitude. Newman and Manning (2001) found that visitors will tolerate higher numbers of encounters while hiking than while in camp. A 2009 NPS study examined the frequency of wilderness encounters with other hikers at three points in the upper Merced River corridor. The encounter rate findings are shown in table 9-152.

**TABLE 9-152: WILDERNESS ENCOUNTERS OBSERVED IN UPPER MERCED RIVER CORRIDOR (2010)**

Location	Number of Encounters with Other Groups	Number of Encounters with Individuals	Number of Encounters with Stock
Little Yosemite Valley	1.73 parties/hour	4.06 people/hour	1.47 stock/hour
Echo Valley	2.13 parties/hour	5.57 people/hour	unknown
Washburn Lake	0.68 parties/hour	1.58 people/hour	0.09 stock/hour
SOURCE: NPS, 2012d			

The designated wilderness camping areas within Little Yosemite Valley and Merced Lake wilderness zones typically experience heavy use, especially throughout the peak visitation season, between Memorial Day and Labor Day weekends. (Fincher 2010).

**Primitive Recreation.** Factors that reduce the visitors' ability to experience self-reliance and the use traditional skills include:

- Presence of structures and installations
- Use of helicopters and other motorized equipment
- **Recreation Activities.** The majority of types of recreation activities in Segment 1 (hiking, backpacking, fishing and camping) have the dimensions of simplicity, lack of technology, and self-reliance. Photography, swimming, wildlife viewing, and contemplation are also activities that enable wilderness visitors to experience the sense of solitude, self-reliance, exploration, and adventure that contribute to a fulfilling wilderness experience. Guided pack trips and commercial-guided and NPS-guided hiking trips are less primitive (because they are less self-reliant) and less solitary (due to generally larger group sizes) forms of recreation that occur in Segment 1.

**Unconfined Recreation.** Factors influencing unconfined recreation in Segment 1 include:

- Management restrictions on visitor behavior once inside the wilderness including requirements to camp in designated camping areas, requirements where camping is prohibited, regulations prohibiting fires or pets and requiring the use of existing fire rings.

#### *Segment 5: South Fork Merced River Above Wawona*

**Untrammelled.** Human activities and actions that control or manipulate the components or processes of ecological systems are limited in Segment 5 but include restoration activities and suppression of fires caused by lightning.

**Natural Condition.** There are few effects of modern people on the ecosystem in Segment 5. Few studies exist regarding the natural condition of wilderness areas within the South Fork Merced River corridor, and it is generally thought to be in excellent condition. This is due, in part, to its lack of permanent improvements and limited accessibility to wilderness travelers.

Within the overall study area, which includes 1.25 miles on either side of the river corridor, manmade features include a network of small roads in the Sierra National Forest south of the study area, including Iron Creek, Grizzly Creek, and Quartz Mountain Roads.

**Undeveloped.** The only permanent/semipermanent improvements or human habitation in Segment 5 are trails and trail signs. There are no designated camping areas within the wilderness areas of the South Fork Merced River corridor. Horse Thief Camp is an established primitive stock camp occasionally visited by guided pack trip parties. It is one of approximately 50 locations within the park that contains a “drift fence” to contain stock when the camp is in use. Between 2004 and 2010, commercially guided pack trips in Segment 5 averaged 13 stock-use nights, with a high of 50 in 2009. All use occurred at Horse Thief Camp (NPS 2011i).

**Solitude or Primitive and Unconfined Recreation.** Factors that reduce the visitor’s ability to experience the wilderness include visitor encounters and crowding, recreation facilities, and management restrictions. In Segment 5, the following elements affect solitude or primitive and unconfined recreation:

**Visitor Encounters.** Visitation within Segment 5 is considerably lower than in Segment 1. Encounter rates are expected to be low and opportunities for solitude relatively high within the wilderness areas of the South Fork Merced River corridor.

**Recreation.** As with Segment 1, the most common wilderness visitor activities along the South Fork Merced River are primitive in nature. These include hiking and backpacking, with a small amount of private and commercial stock use. Access is via both formal trails and cross country travel. Both day use and dispersed overnight camping occur in this segment.

**Unconfined Recreation.** Management restrictions on visitor behavior once inside the wilderness are limited in Segment 5 as there are no designated camping areas. Wilderness regulations would continue to prohibit pets and camping in certain areas, as well as requiring the use of existing fire rings.

## Wilderness Character

### *Environmental Consequences Methodology*

This analysis evaluates how wilderness character in the Merced River corridor might be altered by the actions described in the alternatives. The elements of wilderness character that are examined are untrammeled, undeveloped, natural character, solitude, primitive, and unconfined recreation.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For this analysis, local impacts would be those that occur in a specific area within a segment of the river. This analysis further identifies if there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area within Yosemite. Regional impacts would be those that extend to the Yosemite gateway region.
- **Intensity.** The intensity of the impact considers whether the impact on the elements of wilderness character would be negligible, minor, moderate, or major.
  - **Negligible:** There would be no effect or effects would not be measureable. Any effects to wilderness would be slight, short term, and localized to the study area.
  - **Minor:** Effects on wilderness character, including changes in encounter rates, agency imposed restrictions, or natural character, would be detectable.
  - **Moderate:** Effects on wilderness character would be readily apparent, affect the river segment, and possibly extend beyond the river corridor. Mitigation would probably be necessary to offset adverse impacts.
  - **Major:** Effects would be readily apparent and would substantially change wilderness character locally as well as parkwide. Extensive mitigation would likely be necessary to offset adverse impacts and success could not be guaranteed. Major impacts could include adding or removing permanent installations.
- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration, such as impacts associated with construction or restoration activities. A long-term impact would have a

permanent effect on wilderness character, at least within the planning horizon for the Merced River Plan.

- **Type of Impact.** Impacts were evaluated in terms of whether they would be beneficial or adverse to wilderness character. Identification of beneficial and adverse impacts on each of the elements of wilderness character follows:
  - ***Untrammeled.*** The quality of wilderness character protects wilderness areas from modern human control or manipulation of the biophysical environment. An action is considered adverse when there is manipulation of the biophysical environment (such as restoration or controlling fires caused by lightening) and beneficial if it reduces the effects of such manipulation. Generally, an action would only benefit the untrammeled quality if it was a policy change such as no longer suppressing fires in the wilderness.
  - ***Natural.*** This factor considers whether wilderness ecological systems are substantially free from the effects of modern civilization. The effects of an action are considered to be adverse when it increases the effects of modern humans on ecological systems. Effects are considered beneficial when they decrease such effects, through either natural recovery or intentional restoration.
  - ***Undeveloped.*** The Wilderness Act states that wilderness is “an area of undeveloped Federal land . . . without permanent improvements” and “with the imprint of man’s work substantially unnoticeable.” This element considers the amount and type of permanent improvements, structures, installations, and administrative use of motorized tools and mechanized transportation. Improvements in wilderness are generally judged by a number of criteria. Developments in wilderness are generally judged by both number and type. Actions that increase the number of developments or the visual obtrusiveness, permanence, or technological sophistication of the development are considered to be adverse; actions that result in fewer developments or that are less obvious, more temporary, or more primitive are considered beneficial.
  - ***Opportunities for Solitude.*** In wilderness areas, visitor experience is influenced by the number of other groups encountered during a given time period. Actions that increase crowding are considered adverse, while those that reduce crowding are considered beneficial. In high-use wilderness areas such as Segment 1 of the Merced River corridor, solitude is determined to be an area free from crowding. The threshold for crowding is determined in part through visitor surveys that indicate values and attitudes on crowding and congestion. These survey results are compared to encounter rates, people at one time, and/or people per viewshed to determine how visitor-informed thresholds for crowding compare with actual visitor use.
  - ***Primitive Recreation.*** The opportunity for primitive recreation and the quality of primitiveness were considered as having the dimensions of simplicity, lack of technology, and self-reliance (Johnson, Hall, and Cole 2005). Actions that decrease the opportunities for this type of recreation are considered adverse; those that increase such opportunities are considered beneficial.
  - ***Unconfined Recreation.*** This factor considers the difficulty for visitors to travel freely once inside the wilderness and the extent of regulatory requirements placed on them. Actions which increase the managerial control and oversight of wilderness visitors such as requiring visitors to camp in designated areas, are considered adverse, while those that reduce managerial control and oversight are considered beneficial.

## ***Environmental Consequences of Alternative 1 (No Action)***

The following section provides an overview of the types of impacts on wilderness character that could occur within the Merced River corridor under Alternative 1 (No Action). This analysis of impacts is limited to Segments 1 and 5. The entirety of Segments 1 and 5 are designated wilderness.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Untrammeled.** Under Alternative 1 (No Action), current activities and actions that exhibit human control and manipulation of the landscape would continue. These management activities strive to repair visitor impacts and include restoration, removal of non-native vegetation, obliterating informal trails, and removal of illegal campsites, fire rings and trash. Although beneficial to other aspects of wilderness character, these activities would have the effect of further manipulating the natural environment. Because these activities are generally over relatively small areas, the impacts of these activities on the untrammeled character of the wilderness would be local, negligible, long-term, and adverse.

**Natural.** Under Alternative 1 (No Action) the current management activities described above would serve to improve the natural conditions in Segment 1. Removal of non-native vegetation, obliteration of informal trails, educational and enforcement efforts to alter visitor behavior and lessen their impact, and other management activities would allow natural processes to continue with reduced interference from human impacts. The impact of these activities on the natural character of the wilderness would be local, minor, long-term and beneficial.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Untrammeled.** Under Alternative 1 (No Action) activities such as hazard tree removal to protect visitors to the Merced Lake High Sierra Camp, would maintain the human control and manipulation of a natural processes. The impacts of this and similar activities on the untrammeled character of the wilderness would be local, minor, long-term, and adverse.

**Undeveloped.** Under Alternative 1 (No Action), the permanent and semi-permanent structures and facilities in Segment 1 would remain as they are currently and be managed and maintained as they are today. These include the structures and infrastructure at Merced Lake High Sierra Camp, the designated camping areas, and the ranger stations. Motorized equipment would remain in use to operate the High Sierra Camp. Occasional helicopter use would continue to be used to transport goods, materials and waste that cannot be transported by stock to and from the High Sierra Camp. There would be no additional development or improvements under Alternative 1 (No Action). The impact of these activities on the undeveloped character of the wilderness would be local, major, long-term, and adverse.

**Natural.** Under Alternative 1 (No Action), most wilderness natural resources and ecosystems would remain intact because of the relationship between resource protection and wilderness quotas. In areas

of more intense visitor use (designated camping areas, Merced Lake High Sierra Camp, and along trail corridors), natural resources would continue to show impacts of human use although some restoration and repair would continue to occur. Wilderness patrols, permit requirements, and educational efforts designed to help visitors understand and protect natural resources by altering their behavior would also benefit the natural component of wilderness character. Degradation of meadows and other sensitive resource areas would continue from stock grazing. The projected increase in day visitors in Little Yosemite Valley due to increased park visitation may increase human impacts on the natural resources in this portion of Segment 1. This increase would be small because day hikers must hike 2.5 miles before reaching the Segment 1 wilderness. (Day hikers (except those climbing Half Dome) do not require a permit to hike into the wilderness). Current activities have both adverse and beneficial impacts on the natural character of the wilderness. Overall however, Alternative 1 (No Action) would have a local, moderate, long-term, adverse impact on the natural character of the wilderness.

**Solitude.** Under Alternative 1 (No Action), wilderness encounter rates closest to Segment 2 would be expected to increase slightly from current rates due to increased visitation to the park. This increase would be small because day hikers must hike 2.5 miles before reaching the Segment 1 wilderness. (Day hikers (except those climbing Half Dome) do not require a permit to hike into the wilderness). Encounter rates would remain at current levels farther into the wilderness as the wilderness zone capacities are not expected to change. The total wilderness zone capacity in Segment 1 would remain at 380 people. Conflicts and encounters between stock and hikers would also continue under Alternative 1 (No Action). Designated camping areas would remain in Alternative 1 and are less conducive to solitude than dispersed camping. Impacts of Alternative 1 (No Action) on solitude would be local, minor, long-term and negligible.

**Primitive.** Under Alternative 1 (No Action), most experiences in the Yosemite Wilderness would remain as they are today— primitive in nature and exhibiting simplicity, self-reliance, and a lack of technology. Predominant activities, which would continue under Alternative 1, are hiking and backpacking. Camping would continue to be a mix of dispersed camping and camping in the three wilderness camping areas in Segment 1 (Merced Lake and Little Yosemite Valley, which have developed facilities including restrooms, and Moraine Dome, which does not have any developed facilities). Fishing would also continue in Segment 1 under this alternative. Boating would continue to be prohibited in designated wilderness. Activities that would continue and are less primitive in nature include overnight concessioner pack trips. Areas that would continue to promote a less primitive experience are the Merced Lake High Sierra Camp, a developed overnight facility with 60 beds, food service, and restrooms. Impacts of Alternative 1 on the primitive quality of the wilderness would be local, major, long-term and adverse.

**Unconfined Recreation.** Under Alternative 1 (No Action), the ability for visitors to travel freely once inside the wilderness and the regulatory requirements placed upon them would remain as they are today. Permit regulations would remain unchanged. Day hikers not going to Half Dome do not need a day-use permit to hike in the wilderness and therefore would continue to have the greatest opportunity for unconfined recreation. Alternative 1 would have a segment-wide, moderate, long-term and adverse impact on the unconfined quality of wilderness.

**Segment 1 Impact Summary:** Implementation of Alternative 1 would result in segmentwide and local, long-term, moderate to major, adverse impacts on wilderness character within Segment 1.

## **Segment 5: South Fork Merced River Above Wawona**

### ***Impacts of Actions to Protect and Enhance River Values***

**Natural.** Under Alternative 1 (No Action), the ecosystem in Segment 5 would continue to function with limited human interference due to the near absence of facilities in this segment and the rugged nature of the landscape.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Undeveloped.** There are no developed facilities in Segment 5. Therefore, Alternative 1 (No Action) would have no impact on the undeveloped character of the wilderness.

**Solitude.** Under Alternative 1 (No Action), a wide range of opportunities for solitude would continue. Encounter rates in Segment 5 are not well studied, but this segment is less frequently visited than Segment 1. The total capacity of the wilderness zones in Segment 5 would remain at 15. Alternative 1 (No Action) would have no impact on solitude.

**Primitive.** Under Alternative 1 (No Action), there would be no developed facilities in Segment 5; thus, experiences in this segment would remain primitive in nature and exhibit simplicity, self-reliance, and a lack of technology. Alternative 1 (No Action) would have no impact on the primitive character of wilderness in Segment 5.

**Unconfined Recreation.** Under Alternative 1 (No Action), the wilderness permit system would continue to regulate certain activities while visitors are in the wilderness including the use of existing fire rings and the minimum distance a camp site can be from the water. Alternative 1 would have a segmentwide, negligible, long-term, adverse impact on unconfined recreation in Segment 5.

**Segment 5 Impact Summary:** Implementation of Alternative 1 would result in segmentwide, long-term, negligible, adverse impacts on wilderness experience within Segment 5.

## **Summary of Impacts from Alternative 1 (No Action)**

Under Alternative 1 (No Action), the greatest impacts on the wilderness character in Segment 1 would be from the infrastructure and visitor use associated with the Merced Lake High Sierra Camp and from improvements to and concentrated visitor use of the three wilderness camping areas in this segment— Little Yosemite Valley, Moraine Dome, and Merced Lake. In addition, under Alternative 1, the wilderness permit requirements detract from the character of unconfined recreation. Alternative 1 would have a local, moderate to major, long-term, adverse impact on wilderness character in Segment 1. In Segment 5, the impact of Alternative 1 (No Action) on wilderness character would be negligible.

## Cumulative Impacts of Alternative 1 (No Action)

Cumulative effects on wilderness character are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region. The projects identified below include only those projects that could affect wilderness character within the river corridor or in the study area.

### *Past Actions*

The wilderness permit/trailhead quota system, established in 1974–1976, set limits for the number of people allowed entering the wilderness per day per trailhead. These limits were based on extensive research and monitoring to assess capacity based on ecological and social considerations, and were in response to exceptionally high levels of use in the early to mid-1970s. This system has had beneficial impacts on the wilderness character by protecting natural resources; by contributing to the untrammelled, undeveloped, and natural character of the wilderness; and by providing solitude and primitive and unconfined recreation. In recent years, Yosemite has issued wilderness permits through the use of a trailhead quota system. This limits the number of people camping in the wilderness, thereby enhancing opportunities for experiencing solitude. However, this system represents an agency restriction that affects unconfined recreation in the wilderness.

### *Present Actions*

The wilderness permit/trailhead quota system continues to limit and/or disperse use based on trailhead access. Limiting the number of overnight visitors is likely to protect natural values, and promote solitude but has an adverse impact on the unconfined component of wilderness character.

The Half Dome Interim Permit Program: 2010-2012 manages access to Half Dome to a target of 400 people per day. This permit system is considered the minimum required action to protect and enhance all aspects of wilderness character, particularly opportunities for solitude. The purpose and need for this project was to protect and enhance wilderness character, address safety and risk management concerns, and bring the Half Dome Trail corridor into compliance with the Wilderness Act.

The *Half Dome Trail Stewardship Plan* addresses crowding along the length of the two-mile trail and by doing so, addresses congestion on the final 400 feet of the trail to the summit. The Half Dome trail is outside the Merced River corridor but within the study area.

The Wilderness Restoration Program ecologically restores visitor use impacts to protect and enhance the natural condition and wilderness character.

Several other plans or restoration efforts are in various stages of development and implementation, including the following:

- *Fire Management Action Plan for Wilderness* (U. S. Forest Service [USFS])
- *Sierra Nevada Framework for Conservation and Collaboration* (USFS)



- Management Direction for the John Muir, Ansel Adams and Dinkey Lakes, and Monarch wildernesses (USFS)
- *Pinecrest Basin Forest Plan Amendment* (USFS, Stanislaus National Forest)
- *Tuolumne Wild and Scenic River Comprehensive Management Plan* (NPS)

### ***Reasonably Foreseeable Future Actions and Conditions***

Reasonably foreseeable future actions proposed in the Yosemite region that could have a cumulative beneficial effect on wilderness character are described below:

- The *Yosemite Wilderness Stewardship Plan/EIS* will address land management issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite.
- Clean Water Act and Health and Food Safety Code regulatory updates could result in required upgrades and improvements to wilderness water and wastewater treatment facilities.

### ***Overall Cumulative Impact***

The past, present, and future actions, when considered with Alternative 1 (No Action), would result in improved protection and enhancement of wilderness resources; continued limits on overnight use; and retention of manmade structures and facilities. The overall cumulative impact of Alternative 1 (No Action) on wilderness character would be local, moderate to major, long term and adverse.

## ***Environmental Consequences of Actions Common to Alternatives 2–6***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Programmatic biological resource actions common to all alternatives include:

- Re-route trails out of sensitive habitats through wetlands. New trail routes should avoid wetlands and special status habitat.
- Merced Lakeshore Meadow: Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants.
- Relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Harden the trail along the wet sections of the Mist Trail to avoid trail widening.
- Reroute the Triple Fork Peak meadow trails to upland where possible.
- Remove and restore informal trails in meadows.

- Relocate or remove all campsites at least 100' away from the ordinary high water mark
- Direct visitor use along river to stable and resilient access points such as sandy beaches and low-angle slopes through delineated trails, maps and brochures. Areas susceptible to erosion—steep riverbanks, and high use areas exhibiting vegetation and soil loss from compaction—will be closed and restored.

**Untrammled.** Biological resource actions, although beneficial to other aspects of wilderness character, would have a local, negligible, long-term, adverse impact on the untrammled quality of wilderness character as restoration involves human manipulation of ecological systems.

**Natural.** Biological resource actions would have a local, minor, long-term beneficial impact on the natural component of wilderness character in Segment 1 as eliminating grazing, removing non-native species and restoration allow ecological processes to recover and lessen some of the evidence of modern civilization on natural areas. Wilderness patrols, permit requirements, and educational efforts designed to help visitors understand and protect natural resources by altering their behavior would also benefit the natural component of wilderness character.

**Unconfined.** Biological resource actions involving closure, rerouting, and revegetation of informal trails would have a local, minor, short-term, adverse impact on unconfined recreation because these actions would limit the visitor's ability to travel freely in the areas being restored.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

There is one programmatic action proposed to manage use and facilities for Segment 1 that is common to Alternatives 2 – 6. This action is to allow private boating in the wilderness. Because of the difficulty of getting any type of boat or raft into the wilderness, it is unlikely that this would become a widespread activity in Segment 1. Because private boating is not a permanent action, it would have no impact on the untrammled, natural, undeveloped, primitive, unconfined, and solitary aspects of wilderness character.

**Segment 1 Impact Summary:** Actions to protect and enhance river values would have local, long-term, minor, beneficial impacts on wilderness experience within Segment 1. Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on wilderness experience within Segment 1.

#### **Segment 5: South Fork Merced River Above Wawona**

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

There are two actions proposed to manage use and facilities in Segment 5 that are common to Alternatives 2–6. These are to allow private boating in the wilderness and remove informal trails and charcoal rings to protect cultural resources. Because of the difficulty of getting any type of boat or raft into the wilderness, it is unlikely that this would become a widespread activity in Segment 5. Because private boating is not a permanent action, it would have no impact on the untrammled, natural, undeveloped, primitive, unconfined, and solitary aspects of wilderness character. The removal of

informal trails and charcoal rings would have a local, long-term, minor, adverse impact on the untrammelled quality of the wilderness due to the manipulation required to remove the trails and fire rings. It would also have a local, long-term, negligible, beneficial impact on the natural character of the wilderness in Segment 5. This action would have no impact on the other aspects of wilderness character.

**Segment 5 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, beneficial impacts on wilderness experience within Segment 5.

### **Summary of Impacts from Alternatives 2–6**

The management actions common to Alternatives 2–6 focus on restoration and repair of natural resources in Segments 1 and 5. Restoration actions could have a local, negligible, long-term, adverse effect on the untrammelled quality of the Merced Lake Shore Meadow and East Meadow and a local, minor, beneficial impact on the natural qualities of the Yosemite Wilderness.

### **Cumulative Impacts Common to Alternatives 2–6**

Cumulative effects on wilderness character are based on consideration of past, present, and reasonably foreseeable future actions in the Yosemite region, in combination with potential effects of measures common to Alternatives 2–6. The projects identified below include only those projects that could affect wilderness character within the Merced River corridor or the study area.

#### ***Past Actions***

The 1980 *Yosemite General Management Plan* is the basic document for management of Yosemite National Park. The *Merced River Plan/EIS* would amend the *Yosemite General Management Plan* to meet the mandates of the WSRA.

The 1989 *Yosemite National Park Wilderness Management Plan* establishes management direction for Yosemite's wilderness areas and includes a trailhead quota system for overnight visitors and a Wilderness Impacts Monitoring System (WIMS) to track and address use-related impacts in wilderness areas.

#### ***Present Actions***

Projects currently underway that may have an effect on wilderness character include:

- The *Yosemite Wilderness Stewardship Plan/EIS* will address land stewardship issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite. The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component. It may prescribe actions that are more restrictive than the Merced River Plan in order to preserve wilderness character. The Wilderness Stewardship Plan cannot prescribe actions that are less restrictive than the Merced River Plan or the actions may fail to protect river values.

- The Half Dome Interim Permit Program: 2010-2012 manages access to Half Dome to a target of 400 people per day. This permit system is considered the minimum required action to protect and enhance all aspects of wilderness character, particularly opportunities for solitude. The purpose and need for this project is to protect and enhance wilderness character, address safety and risk management concerns, and bring the Half Dome trail corridor into compliance with the Wilderness Act.
- The *Half Dome Trail Stewardship Plan* addresses wilderness character on the Half Dome trail and may affect use patterns along trails between Happy Isles and Little Yosemite Valley.
- The Wilderness Restoration Program ecologically restores visitor use impacts to protect and enhance the natural condition and wilderness character.
- The *Yosemite Long-Range Interpretive Plan* outlines a comprehensive approach to interpreting park natural and cultural resources and will guide interpretive and educational efforts for the next 5 to 10 years.

### ***Reasonably Foreseeable Future Actions and Conditions***

The following is a reasonably foreseeable future action proposed in the Yosemite region that could have a cumulative beneficial effect on wilderness character:

The *Yosemite Wilderness Stewardship Plan/EIS* will address land management issues within the Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite.

### ***Overall Cumulative Impact from Actions Common to Alternatives 2–6***

The cumulative impact of the wilderness management measures common to Alternatives 2–6 in conjunction with past, present, and reasonably foreseeable future projects would be local (in Segments 1 and 5), long term, minor, and beneficial. The management measures common to Alternatives 2–6 for Segment 1 would improve the natural, and undeveloped character of the wilderness by eliminating informal trails. Planned present and future actions would improve wilderness protection and enhancement and limit access to protect wilderness character.

### ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Biological resource actions under Alternative 2 include:

- Remove the Merced Lake East Meadow from grazing permanently. Require all administrative pack stock passing through the Merced Lake area to carry pellet feed.

This action would have no impact on the untrammeled, undeveloped, primitive, or unconfined qualities of the wilderness experience. In general, the presence of cattle is not in keeping with the natural quality of the wilderness. Removal of grazing on Merced Lake East Meadow would benefit the natural quality of the meadow. However, stock would still be present on the trails and in the vicinity of Merced Lake and would continue to have an effect on these less fragile parts of the ecosystem. This action would have a local, minor, long-term, adverse impact on the natural quality of the wilderness in Segment 1.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 2, a number of actions are proposed to manage visitor use and facilities including:

- Discontinue designated camping at Little Yosemite Valley camping area, and remove infrastructure, including composting toilet. Allow dispersed camping in this area.
- Close Merced Lake High Sierra Camp and allow dispersed camping at Merced Lake Backpackers Camping Area into the High Sierra Camp footprint. Convert area to designated Wilderness.
- Discontinue designated camping at the Merced Lake Backpackers Camping Area. Allow dispersed camping in the areas of the former Merced Lake Backpackers Camping Area and the Merced Lake High Sierra Camp; remove flush toilets and waste-water system.
- Discontinue designated camping at Moraine Dome. Allow dispersed camping in this area.
- Manage to a capacity of 25 (83% reduction) in the Little Yosemite Valley Zone using a zone quota or zone pass through system. All other zone capacities within the Merced WSR Corridor remain the same.

Impacts of these actions on wilderness character include:

**Untrammeled.** Under Alternative 2, restoration activities required at Merced Lake High Sierra Camp and in the designated camping areas would have a long-term negligible impact on the untrammeled character of the wilderness due to the control and manipulation required to restore the area.

**Undeveloped.** Under Alternative 2, the removal of the permanent and semi-permanent improvements and infrastructure in Segment 1 and restoration to natural conditions would greatly improve the undeveloped character of the wilderness and would also significantly reduce the use of motorized equipment and eliminate the need for routine helicopter trips. By removing the High Sierra Camp and providing the most dispersed camping of any alternative; Alternative 2 would exhibit the most undeveloped character of any alternative.

**Natural.** Under Alternative 2, the removal of facilities and infrastructure and conversion to dispersed camping, and the reduced number of visitors would improve the natural character of Segment 1. Ecological patterns and processes would be subject to fewer concentrated human impacts and would be allowed to recover. Under Alternative 2, concessioner stock use would be eliminated due to the removal of the Merced Lake High Sierra Camp. Administrative trail crew stock use would be

significantly reduced as trails would require less frequent maintenance due to the removal of the High Sierra Camp. The reduction in stock use would improve the natural character of the wilderness due to reduced introduction of non-native species by stock and reduction of meadow grazing which would improve the natural condition of the meadows. Wilderness patrols, permit requirements, and educational efforts designed to help visitors understand and protect natural resources by altering their behavior would also benefit the natural component of wilderness character.

**Solitude.** Under Alternative 2, wilderness encounter rates would decrease due to the 83% reduction in wilderness zone capacity for the Little Yosemite Valley zone, from 150 to 25 overnight visitors per day. The conversion of all designated camping areas to dispersed camping would also improve the experience of solitude as visitors could camp apart from other campers rather than confined to a designated camping area. These two factors would noticeably improve the experience of solitude for wilderness visitors in Segment 1.

**Primitive.** Under Alternative 2, most of the activities that detract from the primitive nature of the wilderness, which require visitors to be self-reliant, would be removed, including the Merced Lake High Sierra Camp and all infrastructure. In addition, conversion of all of the designated camping areas to dispersed camping and the associated removal of most facilities would also make Segment 1 more primitive in nature and promote activities that exhibit simplicity, self-reliance, and a lack of technology.

**Unconfined Recreation.** Unconfined recreation is affected by management restrictions placed on visitors once they are inside the wilderness. Under Alternative 2, the requirements set forth in the wilderness permits would slightly reduce the ability to “recreate freely in the wilderness” and have a negligible, adverse effect on the quality of unconfined recreation. Day hikers not going to Half Dome do not need a permit and would continue to have the greatest opportunity for unconfined recreation. The conversion of all designated camping areas to dispersed camping would have a beneficial effect on unconfined recreation as visitors would be free to choose where they camp.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, major, beneficial impacts on wilderness experience within Segment 1.

## **Segment 5: South Fork Merced River Above Wawona**

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Undeveloped.** There are no developed facilities in Segment 5.

**Solitude.** Under Alternative 2, a wide range of opportunities for solitude would continue. The total wilderness zone capacity of Segment 5 is currently 15 and would remain so. Encounter rates in Segment 5 are not well studied but these segments are known to be less frequently visited than Segment 1.

**Primitive.** Under Alternative 2, there would be no developed facilities in Segment 5; thus, experiences in this segment would remain primitive in nature and exhibit simplicity, self-reliance, and a lack of technology.

**Unconfined Recreation.** Unconfined recreation is affected by management restrictions placed on visitors once they are inside the wilderness. Under Alternative 2, the requirements set forth in the wilderness permits would reduce the ability to “recreate freely in the wilderness” and have a negligible adverse effect on the quality of unconfined recreation for the limited number of visitors to Segment 5.

**Segment 5 Impact Summary:** Actions to manage user capacities, land use, and facilities would have no impact on the wilderness experience within Segment 5.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Under Alternative 2, the park would eliminate most of the facilities, infrastructure, and activities that diminish wilderness character; reduce the number of overnight visitors to the Yosemite Wilderness; eliminate overnight stock trips; and close Merced Lake High Sierra Camp, restore the area and designate the area as wilderness. Together, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3 and MM-VEX-1 through MM-VEX-2, as applicable (see Appendix C), these actions would have a segmentwide, long-term, major, beneficial impact on wilderness character in Segment 1. Alternative 2 would have no impact on Segment 5.

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Cumulative effects on wilderness character are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions under Alternative 2. The projects identified below include only those projects that could affect wilderness character within the Merced River corridor or in the study area.

#### ***Past Actions***

The *1980 Yosemite General Management Plan* is the basic document for management of Yosemite National Park. The *Merced River Plan/EIS* would amend the *Yosemite General Management Plan* to meet the mandates of the WSRA.

The *1989 Yosemite National Park Wilderness Management Plan* establishes management direction for Yosemite’s wilderness areas and includes a trailhead quota system for overnight visitors and a Wilderness Impacts Monitoring System (WIMS) to track and address use-related impacts in wilderness areas.

#### ***Present Actions***

Projects currently underway that may have an effect on wilderness character include:

- The *Yosemite Wilderness Stewardship Plan/EIS* will address land stewardship issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite. The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component. It may prescribe actions that are more restrictive than the Merced River Plan in order to preserve wilderness character. The Wilderness Stewardship Plan cannot prescribe actions that are less restrictive than the Merced River Plan or the actions may fail to protect river values.
- The Half Dome Interim Permit Program: 2010-2012 manages access to Half Dome to a target of 400 people per day. This permit system is considered the minimum required action to protect and enhance all aspects of wilderness character, particularly opportunities for solitude. The purpose and need for this project was to protect and enhance wilderness character, address safety and risk management concerns, and bring the Half Dome trail corridor into compliance with the Wilderness Act.
- The *Half Dome Trail Stewardship Plan* addresses wilderness character on the Half Dome trail and may affect use patterns along trails between Happy Isles and Little Yosemite Valley.
- The Wilderness Restoration Program ecologically restores visitor use impacts to protect and enhance the natural condition and wilderness character.
- The *Yosemite Long-Range Interpretive Plan* outlines a comprehensive approach to interpreting park natural and cultural resources and will guide interpretive and educational efforts for the next 5 to 10 years.

#### ***Reasonably Foreseeable Future Actions and Conditions***

The reasonably foreseeable future action that could have a cumulative beneficial effect on wilderness character in the region is described below:

The *Yosemite Wilderness Stewardship Plan/EIS* will address land stewardship issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite.

#### ***Overall Cumulative Impact from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

The cumulative impact of the wilderness management measures outlined for Alternative 2 in conjunction with past, present, and reasonably foreseeable future projects would be segmentwide (in Segments 1 and 5), long term, major, and beneficial. Management measures for the wilderness in Alternative 2 would improve the natural, and undeveloped character of the wilderness by removing manmade facilities and stock use. Reducing the number of wilderness visitors and conversion from designated to dispersed camping increases opportunities for solitude. Planned present and future actions would improve wilderness management and limit access to protect wilderness character.



## ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Biological resource actions under Alternative 2 include:

- Develop preliminary grazing capacities for the Merced Lake East Meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed.

This action would have no impact on the untrammelled, undeveloped, primitive, or unconfined qualities of the wilderness experience. Initially this action would have the same impact on the natural quality of the wilderness as Alternative 2 – grazing would be removed from the meadow but the cattle would continue to be present in the same numbers on the trails and elsewhere in the Merced Lake area. Generally, the presence of cattle detracts from the natural quality of the wilderness. Allowing the meadow to recover and then monitoring and adapting grazing levels could potentially reduce the number of cattle in the wilderness and have a local, negligible, long-term **beneficial** impact on the natural quality of the wilderness in Segment 1.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 3, a number of actions are proposed to manage visitor use and facilities including:

- Discontinue designated camping at Little Yosemite Valley camping area, and remove infrastructure, and retain composting toilet. Allow dispersed camping in this area.
- Discontinue designated camping at the Merced Lake Backpackers Camping Area. Allow dispersed camping in the areas of the former Merced Lake Backpackers Camping Area and portions of the Merced Lake High Sierra Camp; replace flush toilets with composting toilet and remove waste-water system.
- Convert Merced Lake High Sierra Camp to a temporary pack camp with a maximum of 15 people allowed. Remove all permanent infrastructure. Convert area to designated Wilderness.
- Discontinue designated camping at Moraine Dome. Allow dispersed camping in this area.
- Manage to a capacity of 75 (50% reduction) in the Little Yosemite Valley Zone using a zone quota or zone pass through system. All other zone capacities within the Merced WSR Corridor remain the same.

Impacts of these actions on wilderness character include:

**Untrammelled.** Under Alternative 3, restoration activities, required at Merced Lake High Sierra Camp and in the designated camping areas would have a long-term negligible impact on the untrammelled character of the wilderness due to the control and manipulation required to restore this area.

**Undeveloped.** Under Alternative 3, the removal of most of the permanent and semi-permanent improvements and infrastructure in Segment 1 and restoration to natural conditions would greatly improve the undeveloped character of the wilderness and would also significantly reduce the use of motorized equipment and eliminate the need for routine helicopter trips. The Merced Lake High Sierra Camp area would be designated as wilderness once the character of this potential wilderness addition had been restored. Together these actions would improve the undeveloped quality of Segment 1.

**Natural.** Under Alternative 3, the removal of facilities and infrastructure and conversion of all of the camping areas to dispersed camping, and the reduced number of visitors would improve the natural character of Segment 1. Ecological patterns and processes would be subject to fewer concentrated human impacts and would be allowed to recover. Two composting toilets – one at Merced Lake and the other at Little Yosemite Valley would lessen the impact of human use on the natural environment. Under Alternative 3, concessioner stock use would be eliminated due to the removal of the Merced Lake High Sierra Camp. Administrative trail crew stock use would be significantly reduced as trails would require less frequent maintenance due to the removal of the High Sierra Camp. The reduction in stock use would improve the natural character of the wilderness due to reduced introduction of non-native species by stock and reduction of meadow grazing which would improve the natural condition of the meadows. Wilderness patrols, permit requirements, and educational efforts designed to help visitors understand and protect natural resources by altering their behavior would also benefit the natural component of wilderness character.

**Solitude.** Under Alternative 3, the capacity of the Little Yosemite Valley zone would be reduced by 50%, from 150 to 75 visitors per day. This reduction in the number of visitors would lessen encounter rates and noticeably improve the experience of wilderness solitude. Conversion of all designated camping areas to dispersed camping would allow campers to camp away from other groups and increase the experience of solitude.

**Primitive.** Under Alternative 3 most of the activities that detract from the primitive character of the wilderness would be removed, including the Merced Lake High Sierra Camp and all infrastructure. Designated camping would be removed at all three camping areas in favor of dispersed camping. Flush toilets would be replaced with a composting toilet at Merced Lake Backpackers Camping Area and the composting toilet at Little Yosemite Valley would remain. Composting toilets reduce the experience of simplicity and self-sufficiency somewhat but, as mentioned above, improve the natural quality of the wilderness. Under Alternative 3, Segment 1 would become more primitive in nature and provide for activities that exhibit simplicity, self-reliance, and a lack of technology.

**Unconfined Recreation.** Unconfined recreation is affected by management restrictions placed on visitors once they are inside the wilderness. Under Alternative 3, the requirements set forth in the wilderness permits would reduce the ability to “recreate freely in the wilderness” and have a negligible adverse effect the quality of unconfined recreation. Day hikers not going to Half Dome do not need a permit and would continue to have the greatest opportunity for unconfined recreation.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, moderate, beneficial impacts on wilderness experience within Segment 1.

## **Segment 5: South Fork Merced River Above Wawona**

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Undeveloped.** There are no developed facilities in Segment 5.

**Solitude.** Under Alternative 3, a wide range of opportunities for solitude would continue. The total overnight capacity of the wilderness in Segment 5 is currently 15 and would remain so. Encounter rates in Segment 5 are not well studied but these segments are less frequently visited than Segment 1.

**Primitive.** Under Alternative 3, there would be no developed facilities in Segment 5; thus, experiences in this segment would remain primitive in nature and exhibit simplicity, self-reliance, and a lack of technology.

**Unconfined Recreation.** Under Alternative 3, wilderness permit regulations would continue to affect the quality of unconfined recreation in Segment 5.

**Segment 5 Impact Summary:** Actions to manage user capacities, land use, and facilities would have no impact on the wilderness experience within Segment 5.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Under Alternative 3, the park would eliminate most of the facilities, infrastructure, and activities that affect wilderness character, reduce Little Yosemite Valley wilderness zone capacity by 50%, reduce stock use, and remove the Merced Lake High Sierra Camp, restore the area and designate it as wilderness while providing a temporary pack camp. Together, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3 and MM-VEX-1 through MM-VEX-2, as applicable (see Appendix C), these actions would have a local, long-term, moderate, beneficial impact on wilderness character in Segment 1. Alternative 3 would have no impact on Segment 5.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Cumulative effects on wilderness character are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions under Alternative 3. The projects identified below include only those projects that could affect wilderness character within the Merced River corridor or within the study area in Alternative 3.

#### ***Past Actions***

The 1980 *Yosemite General Management Plan* is the basic document for management of Yosemite National Park. The *Merced River Plan/EIS* would amend the *Yosemite General Management Plan* to meet the mandates of the Wild and Scenic Rivers Act.

The 1989 *Yosemite National Park Wilderness Management Plan* establishes management direction for Yosemite's wilderness areas and includes a trailhead quota system for overnight visitors and a Wilderness Impacts Monitoring System (WIMS) to track and address use-related impacts in wilderness areas.

### ***Present Actions***

Projects currently underway that may have an effect on wilderness character include the following:

- The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component.
- The Half Dome Interim Permit Program: 2010-2012 manages access to Half Dome to a target of 400 people per day. This permit system is considered the minimum required action to protect and enhance all aspects of wilderness character, particularly opportunities for solitude. The purpose and need for this project was to protect and enhance wilderness character, address safety and risk management concerns, and bring the Half Dome trail corridor into compliance with the Wilderness Act.
- The *Half Dome Trail Stewardship Plan* addresses wilderness character on the Half Dome trail and may affect use patterns along trails between Happy Isles and Little Yosemite Valley.
- The Wilderness Restoration Program ecologically restores visitor use impacts to protect and enhance the natural condition and wilderness character.
- The *Yosemite Long-Range Interpretive Plan* outlines a comprehensive approach to interpreting park natural and cultural resources and will guide interpretive and educational efforts for the next 5 to 10 years.

### ***Reasonably Foreseeable Future Actions***

The following reasonably foreseeable future action is anticipated to have a net beneficial effect:

- The *Yosemite Wilderness Stewardship Plan/EIS* will address land stewardship issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite. The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component. It may prescribe actions that are more restrictive than the Merced River Plan in order to preserve wilderness character. The Wilderness Stewardship Plan cannot prescribe actions that are less restrictive than the Merced River Plan or the actions may fail to protect river values.

### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

The cumulative impact of the wilderness management measures outlined for Alternative 3 in conjunction with past, present, and reasonably foreseeable future projects would be segmentwide (in Segments 1 and 5), long term, moderate, and beneficial. Management measures for the Yosemite wilderness in Alternative 3 would improve the untrammeled, natural, and undeveloped wilderness qualities by removing the Merced Lake High Sierra Camp and infrastructure, converting designated camping areas

to dispersed camping, reducing infrastructure, and reducing stock use. Reducing the number of wilderness visitors increases opportunities for solitude. Planned present and future actions would improve wilderness stewardship and limit access to protect wilderness character.

### ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

Biological resource actions under Alternative 4 include:

- Remove the Merced Lake East Meadow from grazing permanently. Require all administrative pack stock passing through the Merced Lake area to carry pellet feed.

This action would have no impact on the untrammelled, undeveloped, primitive, or unconfined qualities of the wilderness experience. In general, the presence of cattle is not in keeping with the natural quality of the wilderness. Removal of grazing on Merced Lake East Meadow would benefit the natural quality of the meadow. However, stock will still be present on the trails and in the vicinity of Merced Lake and would continue to have an effect on these less fragile parts of the ecosystem. This action would have a local, minor, long-term adverse impact on the natural quality of the wilderness in Segment 1.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, a number of actions are proposed to manage visitor use and facilities including:

- Decrease the designated camping area at Little Yosemite Valley; retain composting toilet.
- Expand Merced Lake Backpackers Camping Area, which is designated camping, into the area of former Merced Lake High Sierra Camp; replace flush toilets with composting toilet and remove waste-water system.
- Close Merced Lake High Sierra Camp and restore the area to natural conditions. Area would be converted to designated Wilderness.
- Continue designated camping at Moraine Dome.
- Manage to a capacity of 100 in the Little Yosemite Valley Zone using a zone quota or zone pass through system. All other zone capacities within the Merced WSR Corridor remain the same.
- Permits required for private boating. Private use limited to 5 boats per day with backcountry permit.

Impacts of these actions on wilderness character include:

**Untrammelled.** Under Alternative 4, restoration activities required at Merced Lake High Sierra Camp would have a long-term negligible adverse impact on the untrammelled character of the wilderness due to the control and manipulation required to restore this area.

**Undeveloped.** Under Alternative 4, the permanent and semi-permanent improvements in Segment 1, including the concrete foundations and permanent structures at Merced Lake High Sierra Camp, would be removed. Some of the designated campsites and all permanent infrastructure at Little Yosemite Valley camping area would be removed. These actions would improve the undeveloped quality of the wilderness in Segment 1.

**Natural.** Under Alternative 4, the removal of facilities and infrastructure at Merced Lake High Sierra Camp, a small decrease in designated camping, and the reduced number of visitors would improve the natural character of Segment 1. The retention of most designated camping areas would have more concentrated human impacts than Alternatives 2 and 3. However, retaining composting toilets would be beneficial to the natural quality of the wilderness. Under Alternative 4, concessioner stock use would be eliminated due to the removal of the Merced Lake High Sierra Camp. Administrative trail crew stock use would be significantly reduced as trails would require less frequent maintenance due to the removal of the High Sierra Camp. The reduction in stock use would improve the natural character of the wilderness due to reduced introduction of non-native species by stock and reduction of meadow grazing which would improve the natural condition of the meadows. Wilderness patrols, permit requirements, and educational efforts designed to help visitors understand and protect natural resources by altering their behavior would also benefit the natural component of wilderness character.

**Solitude.** Under Alternative 4, the capacity of the Little Yosemite Valley zone would be reduced by 33%, from 150 to 100 visitors per day. This would improve the experience of solitude for wilderness visitors in Segment 1. However, because most of the designated camping areas are being retained, Alternative 4 would be less beneficial to wilderness solitude than Alternatives 2 and 3 due to the greater concentration of visitors in the designated camping areas.

**Primitive.** Under Alternative 4, many of the activities that detract from the primitive nature of the Yosemite Wilderness would be removed, including the Merced Lake High Sierra Camp and all its associated infrastructure. Alternative 4 retains most of the designated camping in this area with the exception of a reduction in designated camping at Little Yosemite Valley camping area. Designated camping is a less primitive experience than dispersed camping as the visitor can be less self-reliant. Composting toilets would be located at Little Yosemite Valley and Merced Lake camping areas. These would detract from the primitive wilderness experience but benefit the natural experience.

**Unconfined Recreation.** Unconfined recreation is affected by management restrictions placed on visitors once they are inside the wilderness. Under Alternative 4, the requirements set forth in the wilderness permits would reduce the ability to “recreate freely in the wilderness” and have a negligible adverse effect on the quality of unconfined recreation. Day hikers not going to Half Dome do not need a permit and would continue to have the greatest opportunity for unconfined recreation.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, moderate, beneficial impacts on wilderness experience within Segment 1.

## **Segment 5: South Fork Merced River Above Wawona**

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Undeveloped.** There are no developed facilities in Segment 5.

**Solitude.** Under Alternative 4, a wide range of opportunities for solitude would continue. The total overnight capacity of Segment 5 would continue to be regulated by the wilderness zone system with a capacity of 15 people in Segment 5. Encounter rates in Segment 5 are not well studied but this segment is less frequently visited than Segment 1.

**Primitive.** Under Alternative 4, there would be no developed facilities in Segment 5; thus, experiences in this segment would remain primitive in nature and exhibit simplicity, self-reliance, and a lack of technology.

**Unconfined Recreation.** Under Alternative 4, wilderness permit regulations would continue to affect the quality of unconfined recreation in Segment 5.

**Segment 5 Impact Summary:** Actions to manage user capacities, land use, and facilities would have no impact on the wilderness experience within Segment 5.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Under Alternative 4, the park would eliminate most of the facilities, infrastructure, and activities that affect wilderness character, reduce by 33% the capacity of the Little Yosemite Valley zone, and remove all infrastructure and facilities at Merced Lake High Sierra camp restore the area and designate it as wilderness. Together, with implementation of mitigation measures MM-NOI-1 through MM-NOI-3 and MM-VEX-1 through MM-VEX-2, as applicable (see Appendix C), these actions would have a segmentwide, long-term, moderate, beneficial impact on wilderness character in Segment 1. Alternative 4 would have no impact on Segment 5.

### **Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Cumulative effects on wilderness character are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions under Alternative 4. The projects identified below include only those projects that could affect wilderness character within the Merced River corridor or the study area.

### ***Past Actions***

The 1980 *Yosemite General Management Plan* is the basic document for management of Yosemite National Park. The *Merced River Plan/EIS* would amend the *Yosemite General Management Plan* to meet the mandates of the WSRA.

The 1989 *Yosemite National Park Wilderness Management Plan* establishes management direction for Yosemite's wilderness areas and includes a trailhead quota system for overnight visitors and a Wilderness Impacts Monitoring System (WIMS) to track and address use-related impacts in wilderness areas.

### ***Present Actions***

Projects currently underway that may have an effect on wilderness character include the following:

- The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component.
- The Half Dome Interim Permit Program: 2010-2012 manages access to Half Dome to a target of 400 people per day. This permit system is considered the minimum required action to protect and enhance all aspects of wilderness character, particularly opportunities for solitude. The purpose and need for this project was to protect and enhance wilderness character, address safety and risk management concerns, and bring the Half Dome trail corridor into compliance with the Wilderness Act.
- The *Half Dome Trail Stewardship Plan* addresses wilderness character on the Half Dome trail and may affect use patterns along trails between Happy Isles and Little Yosemite Valley.
- The Wilderness Restoration Program ecologically restores visitor use impacts to protect and enhance the natural condition and wilderness character.
- The *Yosemite Long-Range Interpretive Plan* outlines a comprehensive approach to interpreting park natural and cultural resources and will guide interpretive and educational efforts for the next 5 to 10 years.

### ***Reasonably Foreseeable Future Actions***

The following reasonably foreseeable future action is anticipated to have a net beneficial effect:

- The *Yosemite Wilderness Stewardship Plan/EIS* will address land stewardship issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite. The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component. It may prescribe actions that are more restrictive than the Merced River Plan in order to preserve wilderness character. The Wilderness Stewardship Plan cannot prescribe actions that are less restrictive than the Merced River Plan or the actions may fail to protect river values.

### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

The cumulative impact of the wilderness management measures under Alternative 4 in conjunction with past, present, and reasonably foreseeable future projects would be segmentwide (in Segments 1 and 5), long term, moderate, and beneficial. Management measures for the wilderness in Alternative 4 would improve the natural, and undeveloped wilderness qualities by removing and restoring the Merced Lake High Sierra Camp. The number of wilderness visitors would be reduced, which increases



opportunities for solitude. Planned present and future actions would improve wilderness stewardship and limit access to protect wilderness character.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Biological resource actions under Alternative 5 include:

- Develop preliminary grazing capacities for the Merced Lake East Meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed.

This action would have no impact on the untrammelled, undeveloped, primitive, or unconfined qualities of the wilderness experience. Initially this action would have the same impact on the natural quality of the wilderness as Alternative 2 – grazing would be removed from the meadow but the cattle would continue to be present in the same numbers on the trails and elsewhere in the Merced Lake area. Generally, the presence of cattle detracts from the natural quality of the wilderness. Allowing the meadow to recover and then monitoring and adapting grazing levels could potentially reduce the number of cattle in the wilderness and have a local, minor, long-term adverse impact on the natural quality of the wilderness in Segment 1.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 5, actions to manage visitor use and facilities include:

- Continue designated camping at Little Yosemite Valley camping area. Retain infrastructure, such as composting toilet.
- Retain location of the Merced Lake Backpackers Camping Area as a designated camping area. Replace flush toilets with composting toilet.
- Retain the Merced Lake High Sierra Camp, reducing the capacity to 11 units (42 beds). Replace the flush toilets with composting toilet.
- Continue designated camping at Moraine Dome.
- All zone capacities within the Merced WSR Corridor remain the same.
- Private use limited to 10 boats per day with backcountry permit

Impacts of these actions on wilderness character include:

**Untrammeled.** Under Alternative 5, the minor restoration activities due to the reduction in the size of Merced Lake High Sierra Camp would have a long-term negligible impact on the untrammeled character of the wilderness due to the control and manipulation required to restore this area.

**Natural.** Under Alternative 5, the natural character of Segment 1 would be similar to that in Alternative 1 (No Action) due to the retention of most of the manmade facilities in Segment 1.

**Undeveloped.** Under Alternative 5, Merced Lake High Sierra Camp would experience a reduction in the number of beds, from 60 to 42 beds. This could result in removal of approximately four cabins. The amount of needed infrastructure, food, and supplies would also be reduced, thus lessening the number of trips required to stock the camp. Presumably, the footprint of the camp could be reduced and part of the area restored. Retention of the Merced Lake High Sierra Camp would prevent this area from receiving a wilderness designation. This alternative would also require retention of the existing wastewater facilities to support showers and dishwashing. Alternative 5 also retains designated camping and infrastructure at the Little Yosemite Valley and Merced Lake camping areas. Designated camping and infrastructure are generally present in more developed areas. Despite some improvements, Alternative 5 does not improve the overall undeveloped quality of the wilderness in Segment 1.

**Solitude.** Under Alternative 5, the capacity of the Little Yosemite Valley wilderness zone would remain at the current level of 150 visitors per day; designated camping would remain in all three camping areas; and the High Sierra Camp would only be reduced by 18 beds. Opportunities for solitude would not noticeably improve in Segment 1.

**Primitive.** Under Alternative 5, some of the activities that detract from the primitive nature of the wilderness would be reduced but not eliminated. The number of beds at Merced Lake High Sierra Camp would be reduced from 60 to 42 and flush toilets at the camp replaced with composting toilets. Wastewater facilities would remain to support showers and dishwashing. Designated camping would be retained at the three designated camping areas in Segment 1 which would result in a less primitive experience than dispersed camping. Alternative 5 would not noticeably improve the primitive quality of Segment 1.

**Unconfined Recreation.** Unconfined recreation is affected by management restrictions placed on visitors once they are inside the wilderness. Under Alternative 5, the requirements set forth in the wilderness permits would reduce the ability to “recreate freely in the wilderness” and have a negligible adverse effect on the quality of unconfined recreation. Day hikers not going to Half Dome do not need a permit and would continue to have the greatest opportunity for unconfined recreation.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on wilderness experience within Segment 1.

## **Segment 5: South Fork Merced River Above Wawona**

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Undeveloped.** There are no developed facilities in Segment 5.

**Solitude.** Under Alternative 5 a wide range of opportunities for solitude would continue. The total overnight capacity of Segment 5 would continue to be regulated by the wilderness zone system with a capacity of 15 people in Segment 5. Encounter rates in Segment 5 are not well studied but this segment is less frequently visited than Segment 1.

**Primitive.** Under Alternative 5, there would be no developed facilities in Segment 5; thus, experiences in this segment would remain primitive in nature and exhibit simplicity, self-reliance, and a lack of technology.

**Unconfined Recreation.** Under Alternative 5, wilderness permit regulations would continue to affect the quality of unconfined recreation in Segment 5.

**Segment 5 Impact Summary:** Actions to manage user capacities, land use, and facilities would have no impact on the wilderness experience within Segment 5.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Compared with Alternative 1 (No Action), Alternative 5 would include actions that together with implementation of mitigation measures MM-NOI-1 through MM-NOI-3 and MM-VEX-1 through MM-VEX-2, as applicable (see Appendix C), would have a local, long-term, negligible to minor, beneficial impact on the natural, and undeveloped character of the wilderness and opportunities for wilderness solitude and primitive recreation in Segment 1. Alternative 5 actions in Segment 1 would retain all three designated camping areas at their current size and configuration, and reduce the capacity of the Merced Lake High Sierra Camp by 18 beds. Stock use in the wilderness would be retained to serve the High Sierra Camp and maintain the trails, and the capacity of the Little Yosemite Valley zone would remain at 150 visitors per day, thus maintaining current trail quotas for this zone. Under Alternative 5, no actions would affect Segment 5.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Cumulative effects on wilderness character are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of the actions in Alternative 5. The projects identified below include only those projects that could affect wilderness character within the Merced River corridor or in the study area.

### ***Past Actions***

The 1980 *Yosemite General Management Plan* is the basic document for management of Yosemite. The Merced River Plan/EIS would amend the *Yosemite General Management Plan* to meet the mandates of the WSRA.

The 1989 *Yosemite National Park Wilderness Management Plan* establishes management direction for Yosemite's wilderness areas and includes a trailhead quota system for overnight visitors and a Wilderness Impacts Monitoring System (WIMS) to track and address use-related impacts in wilderness areas.

### ***Present Actions***

Projects currently underway that may have an effect on the wilderness character include the following:

- The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in addressing its Merced River corridor component.
- The Half Dome Interim Permit Program: 2010-2012 manages access to Half Dome to a target of 400 people per day. This permit system is considered the minimum required action to protect and enhance all aspects of wilderness character, particularly opportunities for solitude. The purpose and need for this project was to protect and enhance wilderness character, address safety and risk management concerns, and bring the Half Dome trail corridor into compliance with the Wilderness Act.
- The *Half Dome Trail Stewardship Plan* addresses wilderness character on the Half Dome trail and may affect use patterns along trails between Happy Isles and Little Yosemite Valley.
- The Wilderness Restoration Program ecologically restores visitor use impacts to protect and enhance the natural condition and wilderness character.
- The *Yosemite Long-Range Interpretive Plan* outlines a comprehensive approach to interpreting park natural and cultural resources and will guide interpretive and educational efforts for the next 5 to 10 years.

### ***Reasonably Foreseeable Future Actions and Conditions***

Reasonably foreseeable future actions proposed in the Yosemite region that could have a cumulative beneficial effect on wilderness character are described below:

- The *Yosemite Wilderness Stewardship Plan/EIS* will address land stewardship issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed; soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite. The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component. It may prescribe actions that are more restrictive than the Merced River Plan in order to preserve wilderness character. The Wilderness Stewardship Plan cannot prescribe actions that are less restrictive than the Merced River Plan or the actions may fail to protect river values.
- The Clean Water Act and Health and Food Safety Code regulatory updates could result in required upgrades and improvements to wilderness water and wastewater treatment facilities.

### ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

The cumulative impact of the wilderness management measures under Alternative 5, in conjunction with past, present, and reasonably foreseeable future projects, would be segmentwide (in Segments 1 and 5), long term, negligible to minor, and beneficial. Management measures for the wilderness under Alternative 5 include reducing the Merced Lake High Sierra Camp capacity while maintaining the three existing Segment 1 designated camping areas, stock use, and the current wilderness quotas. Planned present and future actions would improve wilderness stewardship and limit access to protect wilderness character.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Biological resource actions under Alternative 6 include:

- Develop preliminary grazing capacities for the Merced Lake East Meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed.

This action would have no impact on the untrammeled, undeveloped, primitive, or unconfined qualities of the wilderness experience. Initially this action would have the same impact on the natural quality of the wilderness as Alternative 2 – grazing would be removed from the meadow but the cattle would continue to be present in the same numbers on the trails and elsewhere in the Merced Lake area. Generally, the presence of cattle detracts from the natural quality of the wilderness. Allowing the meadow to recover and then monitoring and adapting grazing levels could potentially reduce the number of cattle in the wilderness and have a local, minor, long-term adverse impact on the natural quality of the wilderness in Segment 1.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 6, actions to manage visitor use and facilities are similar to Alternative 1 (No Action) and include:

- Continue designated camping at Little Yosemite Valley camping area. Retain infrastructure, such as composting toilet.
- Retain location of the Merced Lake Backpackers Camping Area as a designated camping area. Replace flush toilets with composting toilet.
- Retain the Merced Lake High Sierra Camp, keeping 22 units (60 beds). Replace the flush toilets with composting toilet.

- Continue designated camping at Moraine Dome.
- All zone capacities within the Merced WSR Corridor remain the same.
- Private use limited to 10 boats per day with backcountry permit

Impacts of these actions on wilderness character include:

**Untrammelled.** Under Alternative 6, the effects on the untrammelled quality of Segment 1 are similar to Alternative 1 (No Action).

**Natural.** Under Alternative 6, the natural character of Segment 1 would be similar to that in Alternative 1 (No Action) due to the retention of all of the manmade facilities in Segment 1. There would be no improvement to the natural character of the wilderness in Segment 1 under Alternative 6.

**Undeveloped.** The effects of Alternative 6 on the undeveloped quality of the wilderness are similar to Alternative 1 (No Action). All of the existing facilities, infrastructure, and designated camping areas would be retained resulting in a level of development very similar to what exists today. Wastewater facilities would need to be retained at the High Sierra Camp in order to support showers and dishwashing. The same amount of use of machinery and equipment would be necessary. Retention of the Merced Lake High Sierra Camp would prevent this area from receiving a wilderness designation. Alternative 6 would not improve the undeveloped character of the wilderness in Segment 1.

**Solitude.** Under Alternative 6, the capacity of the Little Yosemite Valley wilderness zone would remain at the current level of 150 overnight visitors per day and all designated camping areas would remain. Under Alternative 6, opportunities for solitude would not improve in Segment 1.

**Primitive.** Under Alternative 6, the primitive nature of Segment 1 would be similar to Alternative 1 (No Action). Retention of the Merced Lake High Sierra Camp, infrastructure, and designated camping areas all detract from the primitive character of the wilderness in Segment 1.

**Unconfined Recreation.** Unconfined recreation is affected by management restrictions placed on visitors once they are inside the wilderness. Under Alternative 6, the requirements set forth in the wilderness permits would reduce the ability to “recreate freely in the wilderness” and have a negligible adverse effect on the quality of unconfined recreation. Day hikers not going to Half Dome do not need a permit and would continue to have the greatest opportunity for unconfined recreation.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, beneficial impacts on wilderness experience within Segment 1.

## **Segment 5: South Fork Merced River Above Wawona**

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Undeveloped.** There are no developed facilities in Segment 5.

**Solitude.** Under Alternative 6, a wide range of opportunities for solitude would continue. The total overnight capacity of the Segment 5 wilderness is currently 15 and would remain so. Encounter rates in Segment 5 are not well studied but this segment is less frequently visited than Segment 1.

**Primitive.** Under Alternative 6, there would be no developed facilities in Segment 5; thus, experiences in this segment would remain primitive in nature and exhibit simplicity, self-reliance, and a lack of technology.

**Unconfined Recreation.** Under Alternative 6, wilderness permit regulations would continue to affect the quality of unconfined recreation in Segment 5.

**Segment 5 Impact Summary:** Actions to manage user capacities, land use, and facilities would have no impact on the wilderness experience within Segment 5.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Under Alternative 6, the wilderness character would remain much the same as it is today. The Merced Lake High Sierra Camp, designated camping areas and supporting infrastructure would be similar to today. The Little Yosemite Valley wilderness zone capacity would remain the same as under Alternative 1 (No Action), and pack stock would continue to access the wilderness. Therefore, Alternative 6 would improve wilderness character slightly but not to the extent it would be improved with Alternatives 2 and 3. Alternative 6 with implementation of mitigation measures MM-NOI-1 through MM-NOI-3 and MM-VEX-1 through MM-VEX-2, as applicable (see Appendix C), would have a local, long-term, negligible, beneficial impact on wilderness character in Segment 1. Alternative 6 would not affect wilderness character in Segment 5.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Cumulative effects on wilderness character are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region in combination with potential effects of Alternative 6. The projects identified below include only those projects that could affect wilderness character within the Merced River corridor or in the study area.

#### ***Past Actions***

The 1980 *Yosemite General Management Plan* is the basic document for management of Yosemite National Park. The *Merced River Plan/EIS* would amend the *Yosemite General Management Plan* to meet the mandates of the WSRA.

The 1989 *Yosemite National Park Wilderness Management Plan* establishes management direction for Yosemite's wilderness areas and includes a trailhead quota system for overnight visitors and a Wilderness Impacts Monitoring System (WIMS) to track and address use-related impacts in wilderness areas.

### ***Present Actions***

Projects currently underway that may have an effect on wilderness character include the following:

- The *Yosemite Wilderness Stewardship Plan/EIS* will use direction from the Merced River Plan in developing its Merced River corridor component. It may prescribe actions that are more restrictive than the Merced River Plan in order to preserve wilderness character. The Wilderness Stewardship Plan cannot prescribe actions that are less restrictive than the Merced River Plan or the actions may fail to protect river values.
- The Half Dome Interim Permit Program: 2010-2012 manages access to Half Dome to a target of 400 people per day. This permit system is considered the minimum required action to protect and enhance all aspects of wilderness character, particularly opportunities for solitude. The purpose and need for this project was to protect and enhance wilderness character, address safety and risk management concerns, and bring the Half Dome trail corridor into compliance with the Wilderness Act.
- The *Half Dome Trail Stewardship Plan* addresses wilderness character on the Half Dome trail and may affect use patterns along trails between Happy Isles and Little Yosemite Valley.
- The Wilderness Restoration Program ecologically restores visitor use impacts to protect and enhance the natural condition and wilderness character.
- The *Yosemite Long-Range Interpretive Plan* outlines a comprehensive approach to interpreting park natural and cultural resources and will guide interpretive and educational efforts for the next five to 10 years.

### ***Reasonably Foreseeable Future Actions and Conditions***

Reasonably foreseeable future actions proposed in the region that could have a cumulative beneficial effect on wilderness character include:

- The *Yosemite Wilderness Stewardship Plan/EIS* will address land stewardship issues within the Yosemite Wilderness, including visitor use; vegetation associations; air resources; noise issues; watershed, soils; cultural landscapes; and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite.
- Clean Water Act and Health and Food Safety Code regulatory updates could result in required upgrades and improvements to wilderness water and wastewater treatment facilities.

### ***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

The cumulative impact of the wilderness management measures under Alternative 6, in conjunction with past, present, and reasonably foreseeable future projects, would be segmentwise (in Segments 1 and 5), long term, negligible, and beneficial. Management measures for the Wilderness in Alternative 6 would be similar to those that exist currently. The Merced Lake High Sierra Camp, stock use, designated camping areas, and wilderness quotas would not change. Planned present and future actions would improve wilderness stewardship and limit access to protect wilderness character.



## **Park Operations and Facilities**

### ***Affected Environment***

#### **Regulatory Framework**

##### ***Concessions Management Improvement Act of 1998***

The Concessions Management Improvement Act of 1998 instructs the Secretary of the U.S. Department of the Interior to undertake certain actions to ensure the continued operation of the National Park Service (NPS) in a manner that advances the interests of park staff and the visiting public, while ensuring the protection of park resources. With relevance to nearly all aspects of park management, the act includes provisions for employee training, park resource inventory and research, collection of fees and budget development, and expansion of the NPS. In addition, the act provides detailed instruction regarding the award, management, transfer, and duration of concessions contracts.

##### ***Resource Conservation and Recovery Act of 1976***

The Resource Conservation and Recovery Act, as amended, establishes a regulatory structure for the management of solid and hazardous waste from the point of generation to disposal. In particular, applicable provisions include those that address underground storage tanks and sites contaminated with elements identified under Federal and State Resource Conservation and Recovery Act regulations.

##### ***The Architectural Barriers Act of 1968***

The Architectural Barriers Act created a requirement that any building or facility designed, built, altered, or leased with federal funds be accessible to, and usable by, persons with physical disabilities. Official standards for making buildings accessible have been developed and approved over the years, the most current of which is the Architectural Barriers Act Accessibility Standard (ABAAS) (2006). Federal agencies are required to adhere to these standards, and the U.S. Access Board enforces compliance with the law.

##### ***Section 504 of the Rehabilitation Act of 1973, as amended 1978***

Section 504 prohibits discrimination against people with disabilities in all programs, services, and activities conducted by federal agencies or on their behalf.

##### ***Americans with Disabilities Act of 1990***

The Americans with Disabilities Act also sets forth a series of provisions designed to address discrimination against persons with disabilities. The act establishes prohibitions on employer discrimination against those who are or become disabled. Similarly, the act prohibits state and local government agencies and places of public accommodation from discriminating against such persons in their facilities, programs, and activities. It ensures that disabled persons are not denied access to public

accommodations provided by private enterprise, such as hotels, restaurants, and transit systems, and sets forth certain structural accessibility requirements. The act also makes available telecommunications devices and services for the hearing and speech impaired, among numerous other provisions.

### ***National Park Service Management Policies 2006***

The NPS *Management Policies 2006* sets forth the NPS's management principles and establishes a broad policy framework for park management across a wide range of issues, nearly all of which have some connection to park operations and facilities. In addition to providing direction on a diverse range of resource management topics, NPS *Management Policies* also addresses such topics as education and interpretation, law enforcement, park facilities, transportation services, as well as commercial visitor facilities, among many others. This document is updated periodically to reflect changes in NPS policy, new laws and technologies, and improvements in park understanding. These policies supersede those identified in the NPS *Management Policies 2001*.

### **Park Management Divisions and Operations**

Many programs administered by Yosemite National Park are located within or have a direct connection to the Merced River corridor. Park operations are managed under nine basic divisions: Superintendent's Office, Planning, Resources Management and Science, Facility Management, Visitor Protection, Administrative Management, Business and Revenue Management, Project Management, and Interpretation and Education. All of these divisions contribute to making the varied resources of Yosemite available for the public's enjoyment, education, and recreation now and in the future (NPS 2000d). In 2010, these divisions collectively consisted of 1,123 summer employees and 743 winter employees. The park management and operational efforts are complemented by the work of the current primary park concessioner, Delaware North Company (DNC) Parks and Resorts at Yosemite, and several park partners. The following sections outline the roles and responsibilities of the various units that comprise park management and operations.

### ***Management Divisions***

Administrative divisions responsible for park management are described below.

**Superintendent's Office.** The Superintendent's Office is the administrative center of park operations. In addition to overseeing general park business and the work of the various park management divisions, the superintendent's office is also concerned with issues and activities of regional and national public importance that extend beyond the park's boundaries, such as the Hetch Hetchy water and power system, upon which the City of San Francisco depends. Included within the Superintendent's Office are the Superintendent, Deputy Superintendent and Chief of Staff, the Hetch Hetchy Program Manager, Land Resources Program Manager, Public and Legislative Affairs Office, Public Outreach and Engagement Office, and the Safety Office. Facilities necessary to support the Superintendent's operations include office space, meeting space, storage space, vehicle parking, and employee housing.

**Planning.** The Division of Planning interacts with all park management divisions, American Indian tribes, gateway communities, other land management agencies, and the public in comprehensive planning efforts for Yosemite National Park. From wild-and-scenic-rivers planning to transportation and site planning, the division facilitates communication and defines actions that will protect Yosemite's cultural and natural resources while providing quality visitor experiences. Established in 2005, the mission of the division is to ensure that projects are framed and analyzed based on adherence to the laws and statutes guiding the park, as well as those guiding the planning process for environmental and resource protection. The division also seeks to initiate planning efforts that center on transparency and intensive public engagement, where members of the public feel their input is welcomed and valued. Facilities necessary to support the Planning Division operations include office space, meeting space, storage space, and vehicle parking.

**Resources Management and Science.** Resources Management and Science staff is charged with protecting the natural, cultural, and physical resources of the park. They are responsible for resource data collection and monitoring, prescribing natural and cultural resource impacts, mitigation for construction projects, ecological restoration of sensitive areas, and vegetation and wildlife management. The staff in this division has created a monitoring program that tracks the quality of both park resources and visitor experiences. Simply put, the monitoring component serves as a report card to measure how well the park is protecting and enhancing the resource values outlined in the division's User Capacity Management Program. Monitoring results provide park managers with the information they need to make sound, science-based decisions about the impacts associated with human use in the park (NPS 2007f). Facilities necessary to support Resources Management and Science activities and programs include office and storage space, laboratory facilities, vehicle parking, and employee housing.

**Facilities Management.** Facilities Management staff conducts preventive and corrective maintenance on park infrastructure and is responsible for forestry maintenance in conjunction with fire management. The Facilities Management Division is comprised of four branches.

- The Utilities Branch operates and maintains all water and wastewater utility systems – including backcountry utilities (i.e., composting toilets and water systems), operates two wastewater treatment plants within the Merced River corridor, maintains potable water production and the high-voltage electric system parkwide, and performs energy audits on park energy consumption. The Utilities Branch also manages the emergency back-up generators and fuel tanks. Operations are based in El Portal, Yosemite Valley, Wawona, Tuolumne Meadows, and the backcountry.
- The Roads and Trails Branch is responsible for maintaining all park roads, as well as frontcountry and backcountry trails; performing hazard tree removal; operating the Yosemite Valley and Tuolumne Meadows stables; and operating the Sign Shop and the Machine Shop. The Roads and Trails Branch also manages solid waste and explosives. Operations are based in El Portal, Mather, Yosemite Valley, Wawona, and Tuolumne Meadows.
- The Design and Engineering Branch provides engineers, landscape architects, and surveyors and manages project-funding requests.

- The Buildings and Grounds Branch maintains and corrects deficiencies in administrative facilities, employee housing units, and campground facilities. This branch also performs parkwide custodial operations and historic structure preservation. Operations are based in El Portal, Mather, Yosemite Valley, Wawona, and Tuolumne Meadows. In 2000, the park partnered with local agencies to build a composting facility in Mariposa County (NPS 2008g).

Facilities necessary to support Facility Management staff include equipment materials and tools storage, workshop and storage space, warehouse materials storage, office space, archival map storage space, vehicle parking, and employee housing.

**Visitor Protection.** Visitor Protection staff performs various visitor management and resource protection duties, including frontcountry and backcountry wilderness law-enforcement operations, provision of emergency medical services, horse patrol, search and rescue, structural and wildland fire management, transportation and circulation management, and parkwide dispatching services. Protection rangers assist with monitoring natural and cultural resources, perform restoration activities, and provide assistance to park visitors. Facilities necessary to support Visitor Protection activities include the search-and-rescue cache and buildings in Yosemite Valley; wilderness centers and permit kiosks; ranger stations; parking for emergency vehicles and fire engines; incarceration facilities; helicopter landing pads; office, meeting, and storage space; government stock boarding; and employee housing for required occupants. The Little Yosemite Valley Ranger Station and Merced Lake Ranger Station are near the Merced River corridor (Segment 1), and protection rangers regularly travel through these areas to carry out their responsibilities.

**Interpretation and Education.** The purpose of NPS interpretive and education programs is to provide memorable educational and recreational experiences that will (1) help the public understand the meaning and relevance of park resources, and (2) foster development of a sense of stewardship. The programs do this by forging a connection between park resources, visitors, the community, and the NPS (NPS 2006a). Interpretation and education staff is responsible for providing natural, cultural, and physical resource information and interpretive programs throughout the year, consisting of evening programs, ranger-led talks, and open-air tram tours. In addition, staff is responsible for managing the Yosemite Valley and Tuolumne Meadows visitor centers, Pioneer Yosemite History Center, the Indian Village of Ahwahnee, the Yosemite Museum, the Wawona Information Station, and the Nature Center at Happy Isles. The Division of Interpretation and Education includes Curatorial Services, Publications, and the education branch staff. NPS staff recently completed a Comprehensive Interpretive Plan, which outlines a comprehensive approach to interpreting park natural and cultural resources. Facilities necessary to support the Interpretation and Education Division include visitor centers, museums, auditoriums, amphitheaters, office and storage space, vehicle parking, and employee housing.

**Business and Revenue Management.** Business and Revenue Management staff is responsible for overseeing and authorizing special park uses, fee and revenue management, concessions management, the operation and staffing of all park campgrounds and entrance stations, and the Park VIP Program. Additionally, the division manages all contracted concessioner operations, such as lodging, retail, and eating establishments; High Sierra Camp operations; equestrian, rafting, and bicycle rental operations; Badger Pass; the Wawona Golf Course; galleries; and the Yosemite Medical Clinic. The division manages the Incidental Business Permit program, which consists of the regulation of tour buses,

backcountry stock use, commercial tour and recreational guiding services, television and film productions, and weddings. Facilities necessary to support Business and Revenue Management operations include administrative office and storage space, entrance stations, and vehicle parking.

**Administrative Management.** Administrative Management staff is responsible for managing the park's finances and budget, information technology systems, human resources, employee housing, and procurement and contracting. Facilities necessary to support Administrative Management include office and storage space, warehouse facilities, computer operations systems, and vehicle parking.

**Project Management.** Project Management staff is responsible for major land-use planning efforts and facility improvement projects for the park. The division is responsible for estimating design and construction costs, obtaining and managing park project funding, and implementing projects. The Office of Environmental Planning and Compliance branch of Project Management Division completes appropriate NEPA and National Historic Preservation Act compliance for all park projects. Planning facilities necessary to support Project Management include office and storage space and vehicle parking.

### ***Park Partner Operational Areas***

The following paragraphs summarize the various types of operational activities performed by park partners, including the primary park concessioner, throughout the park.

**Primary Park Concessioner.** The current primary park concessioner, DNC Parks and Resorts at Yosemite, provides a variety of support services that complement the work of NPS staff. DNC operates and manages numerous visitor-servicing facilities and operations within the park. These generally include overnight accommodations, food and beverage services, merchandising services, automotive services, visitor activities and other services, and the visitor transportation system. The primary park concessioner operates approximately 386 buildings parkwide (NPS 2012a). As described more fully in the "Visitor Experience" section of this chapter, all of the park lodging is also managed by the primary park concessioner, including The Ahwahnee, Yosemite Lodge, Curry Village, Housekeeping Camp, Wawona Hotel, and the Merced Lake High Sierra Camp. As of 2010, the concessioner-operated Yosemite Valley visitor lodging could accommodate 4,800 people, which is roughly 62% of the valley's total overnight visitor capacity (NPS 2012a). The primary park concessioner is also responsible for the set-up and tear-down of all seasonal concessioner-operated visitor services and seasonal concessioner employee housing in Yosemite Valley and Merced Lake High Sierra Camp. In 2010, the current primary park concessioner employed 1,800 summer and 1,100 winter employees. Concessioner employee housing is discussed under "Park Infrastructure and Facilities," below.

**Concessioner Stock Operations.** Both the NPS and the primary park concessioner use stock to support their operations in the Merced River corridor. As discussed in the "Visitor Experience" section of this chapter, the primary park concessioner uses stock to support the operation of the High Sierra camps and backcountry camping trips. NPS uses stock to support backcountry utilities operations and trail crew camps, to assist with search-and-rescue operations, and for backcountry patrols.

**Other Park Partners.** There are several other park partners operating within the Merced River corridor. Main park partners include the Yosemite Conservancy, Ansel Adams Gallery, and NatureBridge. The activities of each park partner, as they pertain to the corridor, are briefly summarized below.

The Yosemite Conservancy— the nonprofit organization formed by the 2010 merger of the Yosemite Association and the Yosemite Fund — is a philanthropic organization dedicated to the protection and preservation of Yosemite National Park, and the enhancement of visitor experience. The conservancy works to create opportunities for individuals to experience and connect with the park by funding trail repairs, habitat restoration, outdoor programs, volunteer programs, and other programs that may not otherwise happen. The Yosemite Conservancy’s park office is located in the El Portal Administrative Site (NPS 2012e).

The Ansel Adams Gallery is an authorized park concessioner specializing in the work of Ansel Adams. This registered California historic business has been owned and operated by the family of Ansel Adams since 1902. The gallery is located in the heart of Yosemite Valley and offers original artwork, prints, posters, books, calendars, postcards, and DVDs of the artist’s work (NPS 2012e).

NatureBridge is a nonprofit corporation that provides students with hands-on educational adventures in natural settings, including within several national parks. Within Yosemite National Park, NatureBridge offers school and group field-science programs, outdoor educator and wilderness first-responder courses, and field research courses for high school students, among others. The NatureBridge Campus is located at Crane Flat, outside the Merced River corridor. However, the organization also utilizes facilities at Curry Village and Camp Wawona. Field courses are taught in various locations throughout the corridor (NatureBridge 2012).

### **Park Infrastructure and Facilities**

There are 747 National Park Service buildings parkwide, including office buildings, residences, and utility infrastructure located in Yosemite Valley, the El Portal Administrative Site, and along the South Fork Merced River in Wawona (NPS 2012a). Parkwide base operations continue to shift from Yosemite Valley to the El Portal area (NPS 2006b). The El Portal Administrative Site, located adjacent to the park, was established in 1958 and is comprised of both government housing and private employee residences located on federal land. Effective December 2009, a settlement agreement placed a moratorium on El Portal Administrative Site residential and facility construction and expansion. Until July 2013, the settlement agreement imposes constraints on certain types of maintenance and construction activity within the Merced River corridor. In addition, the agreement prohibits new structures that are not considered minor (i.e., small, temporary, not habitable, and not designed to support commercial uses). The agreement notes that existing and future development in the El Portal Administrative Site must protect and enhance the Merced River’s outstandingly remarkable values (NPS 2009).

The following sections summarize the types of park facilities and infrastructure that could be affected by the management actions under consideration in the alternatives analyzed in this EIS. The discussion is divided among administrative facilities, employee housing, and utilities and infrastructure. For

descriptions of trails, camping, lodging, and associated visitor-serving facilities within the Merced River corridor, see the “Visitor Experience” section of this chapter. For descriptions of roads, bridges, tunnels, and parking within the corridor, see the “Transportation” section of this chapter.

### ***Administrative Facilities***

**Segments 1, 5, and 8.** There are no administrative facilities in the wilderness segments of the Merced River corridor.

**Segment 2.** Administrative facilities within the project area are mainly concentrated along the eastern portion of the Yosemite Valley. Within Segment 2, most are located in proximity to the Yosemite Village complex. These include the NPS Administration Building, the Village Post Office, Primary Concession General Office Building and Village Garage complex (garage and fire station), and Wilderness Center. Other administrative facilities in the valley include the Yosemite NPS Volunteer Office and Yosemite Lodge Post Office, both located within the Yosemite Lodge complex.

**Segments 3 and 4.** Administrative facilities within the Merced River gorge include the Arch Rock Entrance Station Kiosk and Administrative Office. Such facilities within the El Portal Administrative Site include the El Portal Maintenance and Administrative Complex.

**Segments 6 and 7.** The Wawona Maintenance Yard complex is the only administrative facility within the South Fork Merced River corridor.

### ***Concessioner Employee Housing***

The Yosemite housing environment is complex and challenging. The park receives nearly four million visitors annually. Yosemite Valley receives more visitors than any other area of the park. As a result, the valley also hosts the largest number of visitor services. The primary park concessioner provides the bulk of visitor services and staffing necessary to accommodate these visitors. However, because the park is located in a remote portion of the Sierra Nevada Mountains, with limited access to only a few gateway communities, concessioner employee housing options outside of the park have historically been quite limited. Other factors limiting concessioner housing outside the park are the flexibility required to staff restaurants and lodges in the early morning and late in the evening, the ability to attract and retain qualified employees for seasonal work, and the desire of communities outside the park in maintaining a rural living environment. As a result, over the years, a considerable amount of concessioner housing has been developed within the Merced River corridor, specifically within the valley. The housing-related management actions described herein mainly concern concessioner employee housing. These management actions would not, however, substantially affect NPS employee housing supply or demand. As such, all subsequent references to employee housing, unless otherwise specified, concern those necessary to support concessioner operations.

**Segment 1.** There is no employee housing located within Segment 1. However, the Merced Lake High Sierra Camp has five beds reserved for administrative staff.

**Segment 2.** Over the years, a considerable amount of that demand for employee housing was met through development of employee housing within the Yosemite Valley. As shown in **table 9-153**, the vast

**TABLE 9-153: EXISTING CONCESSIONER HOUSING WITHIN YOSEMITE VALLEY**

Location	Capacity (beds)
Yosemite Village	431
The Ahwahnee	48
Curry Village	582
Yosemite Lodge	90
<b>Total</b>	<b>1,151</b>

majority of park and concessioner employee housing within the Merced River corridor is found in Yosemite Valley. As the table indicates, housing is concentrated around Yosemite Village, The Ahwahnee, Curry Village, and the Yosemite Lodge. Together these facilities can accommodate approximately 1,151 employees.

Several hundred employee housing units were either destroyed or closed as a result of the 1997 flood and 2008 rockfall, exacerbating an already high demand for employee housing within the valley. Some of that demand has been offset through the development of temporary housing facilities, such as those at Yosemite Lodge, Boys Town, Highland Court, and the Lost Arrow Parking Lot. Nonetheless, the demand for concessioner employee housing within the valley continues to exceed supply by more than 93 units.

**Segments 3 and 4.** Concessioner employee housing within Segments 3 and 4 is largely concentrated within Rancheria and El Portal Village. The number of beds assigned to employees within each area total 107 and 80, respectively. There are also five beds assigned to concessioner employees in the Abbieville area of El Portal.

### *Utilities and Infrastructure*

The following subsections describe the utilities and infrastructure within the Merced River corridor that service park operations and facilities. Electrical and telecommunications infrastructure, which tends to be fairly uniform across the more developed segments of the corridor, are discussed generally for all applicable segments (i.e., Segments 2, 3, 4, and 7). A segment-specific discussion of water and wastewater follows.

NPS purchases power from Pacific Gas & Electric Company (PG&E). Electricity is carried into Yosemite Valley via a 70,000-volt transmission line that runs overhead through El Portal and the Merced River Gorge to the substation at the old Cascades Powerhouse. The powerhouse is no longer active as a hydroelectric generator but is still used as a substation. From the powerhouse, power is stepped down to 12,000 volts. Conductors extend beneath El Portal Road to a substation in Yosemite Village. The Wawona Tunnel and Big Oak Flat Tunnel are served by overhead lines from the powerhouse.

The primary electric distribution system is in generally good condition after upgrades over the last 12 years, although areas in Yosemite Valley still require rehabilitation. End users in Wawona, El Portal, Foresta, and Hodgdon Meadow are served directly by PG&E, whose facilities are within the park in several places. However, in February 2011, the park completed the installation of a 672 kilowatt



photovoltaic system at the El Portal Maintenance and Administrative Complex. The power generated from the project will offset by approximately 12 percent the electricity purchased from the grid (NPS 2011). A ground source heat pump in the Curry Village employee housing utilizes the near-constant temperature of the earth for heating and cooling of the buildings (NPS 2008g). AT&T supplies telephone service into the park and El Portal primarily through microwave transmission. Overhead and underground lines serve various other locations throughout the park and El Portal. Currently, Yosemite relies on aging communication equipment and infrastructure that does not share a single “backbone” technology to transmit information. Many developed areas of the park — Wawona, Crane Flat, Hodgdon Meadows, Hetch Hetchy, and Tuolumne Meadows — are still served by old copper telephone wires which limit staff’s network and internet access. The existing system cannot be upgraded efficiently or effectively and, therefore, Yosemite’s local service provider has limited bandwidth capabilities and no cost-effective way to provide increased bandwidth (NPS 2008h).

**Segment 1.** Utilities within Segment 1 are concentrated around the Merced Lake High Sierra Camp and Merced Lake Backpackers Campground. The former has a septic system and a water purification system. The septic system consists of a septic tank, lift station (run on photovoltaic trackers [PV]), dosing tank, leach field, and associated piping. The water system consists of a chlorinator shed, water pump (run on PV), sand filter, three 1500 gallon tanks, and associated piping. The Merced Lake Backpackers Campground shares the water system with the Merced Lake High Sierra Camp; however, the campground has a separate septic tank and leach field.

Backcountry Utilities (BCU) is responsible for opening and closing the Merced Lake High Sierra Camp’s utilities each season. Using NPS stock, BCU occasionally pack in and out using one to two mules; however, staff also use bicycles to access backcountry utilities for maintenance. The daily operation of the utilities is done by the primary park concessioner. BCU performs maintenance as needed, either coming from Yosemite Valley or from Vogelsang. Each trip is, at minimum, an overnight trip and utilizes only one to two mules when necessary. BCU also opens and closes the Merced Lake Backpackers Campground’s utilities and maintains them once a week during the open season. The primary park concessioner cleans the facilities daily when the High Sierra Camp is open.

The NPS uses helicopters to remove sludge from the High Sierra Camp every three seasons. It does the same for the Merced Lake campground about every six seasons. The former typically requires about 15 flights. For optimal flight utilization, this waste removal is coordinated for efficiency between the High Sierra Camp and the Merced Lake Backpackers Campground.

**Segment 2.** There is an extensive system of water, wastewater, electric, and communications utility systems in Yosemite Valley. Most utility systems in the valley are operating within design capacity. Three wells, a 2.5-million-gallon water storage tank, and several distribution lines supply Yosemite Valley’s users with water. The system has the capacity to produce about 2,800 gallons per minute (gpm). Components of the water system have been replaced and upgraded due to damage sustained in the January 1997 flood and utility realignment for meadow restoration based on other valley plans. These improvements have restored reliability to the system, and allow for remote monitoring and pumping.

Wastewater flows in Yosemite Valley decreased considerably after the flood because several campgrounds and lodging units were damaged or destroyed and subsequently closed. Leakage and

resulting infiltration have been corrected. The Facilities Management Division has made substantial improvements to the sewage collection system in Yosemite Valley, but leakage and infiltration still occur on occasion during high water events. Wastewater in Yosemite Valley is pumped to the west end of Yosemite Valley, where it flows down to the El Portal Wastewater Treatment Plant at Railroad Flat.

**Segments 3 and 4.** El Portal's water supply system consists of six wells adjacent to the Merced River and four tanks with a total storage capacity of 900,000 gallons, for a total production capacity of approximately 220 gpm. The water system in El Portal is marginally sufficient for the current levels of use but does not have adequate capacity to compensate for any component failure or any increased development. However, the facility is expected to be replaced in the near future.

A wastewater line runs between El Portal and Yosemite Valley, beneath El Portal Road on the north side of the Merced River. As noted above, the El Portal Wastewater Treatment Plant at Railroad Flat receives and treats the valley's wastewater. It has a permitted capacity of 1 million gallons per day (gpd) and is located within 0.25 mile of the Merced River.

**Segments 6 and 7.** As with that of El Portal, Wawona's water supply system is marginal, as is the capacity of its wastewater treatment plant. Of the 20 public water systems in the park, Wawona's is one of two that draw solely from surface sources. The Wawona water system takes untreated water directly out of the South Fork Merced River. This system is currently constrained in most years through much of the late summer and early fall because of low flows in the river. The NPS water distribution system in Wawona is supplied by surface water drawn from the South Fork Merced River at a rate of 480 gpm. The potable water is held in four tanks with a total design capacity of 1,250,000 gallons.

In 1987, NPS implemented the *Wawona Water Conservation Plan*, which set the rate of diversion from the Wawona water intake at 288 gpm (NPS 1987). To protect instream flows for aquatic habitat, the plan enacted mandatory water conservation whenever the river reaches flows of less than 6 cubic feet per second. At flows of less than 6 cubic feet per second, diversions are limited to 10% of the river flow. Conservation measures start with banning irrigation use for the Wawona Golf Course and the lawns of homes and other buildings. The NPS is considering other options to increase the reliability of the water system at Wawona, including bringing water into Wawona through a 7-mile pipeline from a spring located in the Big Creek watershed.

A tertiary wastewater treatment plant serves all of the public sources in the town of Wawona, and much of the private residential and commercial development. As with that of El Portal, Wawona's treatment facility is located within 0.25 mile of the river. The Wawona Campground is served by septic tanks and leach fields. When the capacity of the latter is exceeded (or ultimately fails), there is a potential for effluent to migrate into groundwater and the river.

### ***Environmental Consequences Methodology***

The analysis of facilities and operations within this section focuses on administrative facilities, employee housing, utilities and infrastructure, and the operational burden of carrying out the management actions identified under the respective alternatives. The consideration of park facilities in this section is not exhaustive. For example, infrastructure, such as roads, bridges, parking, and shuttle and regional transit,

are addressed in the “Transportation” section of this chapter. Similarly, trails, overnight accommodations, and recreational facilities and services are addressed in the “Visitor Experience” section of this chapter. However, the operational implications of the alternatives, as they pertain to such facilities, are addressed in this section. It is assumed across all alternatives that staffing would remain sufficient to meet visitor needs and carry out regular management and operational duties.

Proposed management actions under the *Merced River Plan/EIS* are evaluated in terms of the context, intensity, and duration of impacts on concessioner and park operations and facilities, and whether the impacts are considered beneficial or adverse.

- **Context.** For the purposes of this analysis, the local, segmentwide, and parkwide implications for operations and facilities are considered. Due to the nature of park operations, unless otherwise specified, all impacts are assumed to be parkwide.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts are effects considered not detectable and would have no discernible effect on operations and facilities. Minor impacts are effects on operations and facilities that would be slightly detectable but not expected to have an overall effect on the ability of the park to provide services and facilities. Moderate impacts would be clearly detectable and could have an appreciable effect on operations and facilities. Major impacts would have a substantial, highly noticeable influence on park operations and facilities and include those impacts that would reduce the ability to provide adequate services and facilities to visitors and staff.
- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional or restoration- or construction-related activities. A long-term impact would have a permanent effect on operations and facilities.
- **Type of Impact.** Impacts are evaluated in terms of whether they would be beneficial or adverse to operations or facilities. Beneficial impacts would improve operations and/or facilities. Adverse impacts would negatively affect operations and/or facilities, or could impede the ability to provide adequate services and facilities to visitors and staff. Beneficial impacts on park operations and facilities include changes to more closely match supply with demand regarding staffing and the inventory of employee housing, administrative facilities, utilities, and infrastructure.

### ***Environmental Consequences of Alternative 1 (No Action)***

The following discussion provides an overview of the types of impacts on park operations and facilities that could occur within each segment of the Merced River corridor from implementation of Alternative 1 (No Action). Under Alternative 1, park operations and facilities within the Merced River and South Fork Merced River corridors would continue to be guided by *NPS Management Policies* and *Superintendent’s Compendium*, among other documents that affect management decisions regarding operations and facilities. Park visitation would be expected to continue growing at the present rate of 3% annually. As a result, the operational burden associated with managing large numbers of park visitors, including those associated with the provision of visitor services; the management of park resources; and the demands on and maintenance of administrative facilities, employee housing, and

utilities; among other aspects of park operations would continue to increase. However, limitations on development activities imposed through the 2009 Settlement Agreement, or restrictions similar thereto, would remain in place for the foreseeable future. Such limitations include prohibitions on the development of any new overnight lodging units or the paving of any park areas or trails that are currently unpaved. In addition, the park would not construct any new structures, except for those that are small, temporary, easily removed, nonhabitable, and designed to support existing uses, systems, and programs (Friends of Yosemite Valley et al. 2009). As such, the administrative facilities and employee housing described in the “Affected Environment” section, above, would be expected to remain in place for the remainder of their useable life. Utilities and infrastructure serving these administrative facilities, employee housing, overnight lodging, and other visitor-serving facilities would also remain in place and be maintained, as necessary, to meet employee and visitor demands.

## Corridorwide Actions

### *Actions to Protect and Enhance River Values*

Under Alternative 1 (No Action), impediments to the free-flowing condition of the Merced River, including riprap, revetments, and abandoned infrastructure, would remain in place. Park staff would continue to undertake measures to ensure a high level of water quality, including regular maintenance of trails and wastewater infrastructure. Ongoing impacts associated with informal trails, conifer encroachment into meadows, and bank erosion associated with high visitation and infrastructure would remain. The park would continue restoration projects in several meadows and on the riverbank in numerous locations (per the Settlement Agreement). As described more fully in the Alternatives chapter, this work would include riparian tree planning, conifer removal, mulching, invasive species control, and the potential use of some heavy equipment (i.e., a bobcat or small excavator). Sensitive cultural resources would continue to experience impacts from informal trails, infrastructure, campgrounds, and parking areas. Park staff would continue to manage cultural resources in accordance with the requirements of the National Historic Preservation Act, and in consultation with the State Historic Preservation Officer and Advisory Council on Historic Preservation. Traffic congestion, vegetation growth, informal trails, and trampled vegetation and riverbanks would continue to affect scenic resources. Park staff would not implement the measures identified in *Scenic Vista Management Plan*. Alternative 1 does not propose any additional measures to address these issues. As such, park staff would experience no short-term impact associated with implementation of Alternative 1. However, the park would continue to experience a negligible to minor, adverse operational impact associated with incremental management of impacts associated with these conditions.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Under Alternative 1, transportation management would continue as under present conditions. During peak summer days, congestion would reach near gridlock levels at park entrances and pinch-points throughout Yosemite Valley. On these days, the number of vehicles entering the valley would exceed the number of available parking spaces, contributing to further congestion and resource impacts associated with the use of existing and newly created informal parking areas. No additional management measures to address these issues would occur under Alternative 1. As such, park staff

would continue to experience a long-term, minor, adverse operational impact associated with traffic and parking management.

### **Segments 1, 5, and 8: Merced River Above Nevada Fall and Merced River Above and Below Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Merced Lake Ranger Station Meadow would continue to experience high levels of bare ground from pack stock grazing and trampling, and informal trails would continue to traverse park meadows. No additional actions would be taken under Alternative 1 to address these issues. The impact on park operations would continue to be long-term, negligible, and adverse.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Wilderness access would continue to be managed by backcountry zone capacities and related trailhead quotas. The quota for Little Yosemite Valley would remain at 150 people. Park staff would continue to incur a negligible to minor, adverse operational impact associated with administration of the trailhead quota system and restoration activities required of visitation at present levels.

Under Alternative 1, the Merced Lake High Sierra Camp would operate at capacity. The camp would continue to host up to 60 guests nightly and provide beds for five employees during summer months. As such, park staff would continue to experience a long-term, negligible to minor, adverse operational impact associated with the seasonal set-up, weekly supply, and daily maintenance of the camp and associated infrastructure (i.e., water supply infrastructure, septic system, leach field, among other features).

The number of designated campsites within the Merced River corridor's wilderness, specifically at Little Yosemite Valley and Moraine Dome Campground, would remain as under present conditions. Dispersed camping would continue at Merced Lake Backpackers Campground. The park would continue to experience a long-term, negligible, adverse operational impact associated with management and maintenance of these facilities.

**Segments 1, 5, and 8 Impact Summary.** Implementation of Alternative 1 would result in parkwide, long-term, negligible, adverse impacts on park operations and facilities.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1, bridges, elevated roadways, abutments, and abandoned infrastructure and fill would remain within the Merced River corridor and continue to affect the river's free-flowing condition. Water quality within Segment 2 would continue to be affected by human activity in and around the river. Such activities within the corridor would continue to affect the river's biological values within Yosemite Valley. While not prescribed under Alternative 1, park staff would continue to

manage traditionally used plant populations in accordance with the invasive plant management program. No action is proposed under Alternative 1 to address these issues. As a result, park staff would experience no changed short-term, operational burden. However, because protecting river values under these conditions would necessitate ongoing maintenance and restoration activities, the impact on park operations would continue to be long-term, minor, and adverse.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Under Alternative 1, the Yosemite Valley would continue to receive approximately 20,900 visitors daily. Daytime visitation would remain around 14,800, while overnight visitation would continue to approach 6,100. Visitation levels would be expected to increase at a rate of approximately 3% annually, commensurate with trends in overall park visitation. The impact on staffing and other resources required to restore areas affected by high visitor use, manage traffic, and maintain visitor-serving facilities would continue to be long-term, minor, and adverse.

Overnight lodging facilities, including those at Curry Village (400 units), Yosemite Lodge (245 units), Housekeeping Camp (266 units), and Ahwahnee Hotel (123 units), would remain in operation and continue to receive guests at present levels. Lodging units within the valley would continue to total 1,034. The management and maintenance requirements of these facilities would continue to have a long-term, negligible to minor, adverse impact on park operations.

The number of campsites within the valley would remain as under current conditions, including those at Camp 4 (35 sites), Upper Pines Campground (240 sites), Lower Pines Campground (76 sites), North Pines Campground (86 sites), Backpackers Campground (25 sites), and Yellow Pine Campground (4 administrative sites). Thus, the valley would continue to host 466 campsites. Through the continued operation of these facilities, and maintenance and restoration required of high visitation in their vicinity, park staff would continue to incur a long-term, negligible to minor, adverse operational impact.

Concessioner operations within the valley would stay in their present locations and conditions. No new concessioner employee housing would be constructed under Alternative 1. As such, employee housing would continue to be concentrated within Yosemite Village (431 beds), the Ahwahnee Hotel (48 beds), Curry Village (605 beds), and Yosemite Lodge (90 beds). The total number of valley housing units assigned to concessioner employees would therefore remain at 1,151. Under these conditions, housing need would continue to exceed supply. As a result, some concessioner employees who work within the valley would continue to reside in housing outside of the valley and commute daily to their place of employment. The long-term operational impact would continue to be negligible to minor, and adverse.

**Segment 2 Impact Summary:** Implementation of Alternative 1 would result in parkwide, long-term, negligible to minor, adverse impacts on park operations and facilities.

## **Segments 3 and 4: Merced River Gorge and El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1, obstructions to the free-flowing condition of the Merced River would remain in the Merced River gorge and El Portal segments, including levees, abandoned infrastructure, riprap, and fill material at the Greenemeyer Sandpit. Within El Portal, vehicles would continue to affect oak trees by parking within their dripline. And water quality would continue to be affected by stormwater runoff from the informal off-street and roadside parking areas between the Merced River and Foresta Road. No actions to address these issues are proposed under Alternative 1. However, park staff would continue to incur a long-term, negligible to minor, adverse impact associated with the incremental management of the impacts stemming from these developments.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segments 3 and 4 would not be expected to change appreciably under Alternative 1. A total of 192 beds would continue to be assigned to concessioner employees, fulfilling existing demand within Segments 3 and 4. There would continue to be no concessioner-operated lodging or campgrounds within these segments. The consequent long-term impact on concessioner operations would be negligible and adverse.

**Segments 3 & 4 Impact Summary:** Implementation of Alternative 1 would result in parkwide, long-term, negligible to minor, adverse impacts on park operations and facilities.

## **Segments 6 and 7: Wawona and Wawona Impoundment**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1, the current water collection and distribution system at Wawona would remain in place. Impacts on water quality associated with abandoned infrastructure, septic systems, and other development in proximity to the Merced River would continue within Segment 7. While no actions are proposed under Alternative 1 to address these issues, park staff would continue to experience a long-term, negligible, adverse impact associated with the ongoing maintenance of infrastructure, specifically wastewater infrastructure, to avoid or minimize impacts on water supply and quality.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Existing visitor facilities in the Wawona area would remain as under present conditions. Roadside parking between the Wawona Store and Chilnualna Falls Road would remain in place and continue to disturb soil and vegetation near the Merced River. The facilities and layout at the Wawona Maintenance Yard are not optimal for operational efficiency and would continue to affect the riparian corridor. Alternative 1 includes no measures to address these issues. However, long-term management of impacts associated with development near the channel would continue to impose a negligible, adverse operational burden on the park.

**Segments 6 & 7 Impact Summary:** Implementation of Alternative 1 would result in parkwide, long-term, negligible, adverse impacts on park operations and facilities.

### **Summary of Alternative 1 (No Action) Impacts**

Under Alternative 1, the park would continue to receive around 20,900 visitors daily, with the number of visitors expected to increase by approximately 3% annually. As visitation continues to increase, operational demands associated with visitation, including law enforcement, traffic management, cultural and resource protection, among others, would be expected to increase. The park's commercial services and overnight accommodations, including the valley's 1,034 lodging units and 466 campsites, would remain in operation. Alternative 1 proposes no new construction. For these reasons, over the long-term, depending on park visitation trends and staffing, the impact on park operations and facilities could be minor and adverse.

### **Cumulative Impacts of Alternative 1 (No Action)**

Cumulative effects on park operations and facilities discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the immediate Yosemite region, in combination with potential effects of Alternative 1. The projects identified below include only those that could affect park operations and facilities within or in the vicinity of the Merced River corridor. Each project is described more fully in the Alternatives chapter.

#### ***Past Actions***

The following is a list of cumulatively considerable past actions concerning park operations and facilities.

- Removal of Cascades housing increased housing demand by eliminating five housing units from Segment 1. The project reduced the operational burdens of maintaining the aging structures.
- The construction of 217 new housing units at Curry Village reduced housing demand by replacing units lost during the 1997 flood. The project increased demand for utilities in Yosemite Valley and operational burdens associated with facilities maintenance.
- Construction of temporary housing for 102 employees at the Curry Village Huff House reduced temporarily the sudden increase in demand resulting from closure of Curry Village units due to rockfall hazard.
- Construction of six temporary housing units at Yosemite Valley Lost Arrow reduced temporarily the sudden increase in demand resulting from closure of Curry Village units due to rockfall hazard.
- Construction of 12 temporary employee housing units at The Ahwahnee reduced the sudden increase in demand resulting from closure of Curry Village units due to rockfall hazard.
- Completion of numerous ecological restoration projects reduces the operational burdens of future restoration efforts in these areas.



### ***Present Actions***

The following is a list of cumulatively considerable present actions concerning park operations and facilities.

- Implementation of the *East Yosemite Valley Utilities Improvement Plan/EA* may reduce utilities demand by improving the efficiency and reliability of utility infrastructure. These improvements also reduce the operational burdens associated with the repair and maintenance of aging infrastructure.
- Completion of the *Mariposa County General Plan* Housing Element Update may contribute to the long-term reduction in demand for housing by providing for the expansion of housing opportunities within the county.
- Installation of traffic counters, development of the Integrated Transportation Capacity Assessment, Parkwide Traffic Management and Information System, and Mariposa Grove area transportation planning projects may reduce traffic-related operational burdens by contributing to transportation management solutions within the park.
- Completion of the Parkwide Communication Data Network could improve operational efficiency through faster and more secure network capabilities, while also reducing the demand on existing telecommunications infrastructure.
- Relocation of 40 park staff from offices in El Portal to Mariposa may reduce the demand for administrative facilities and utilities within El Portal.
- Ongoing ecological restoration projects may reduce the operational burdens of future restoration efforts in these areas.
- Restoration activities at Mariposa Grove and the South Entrance Station Kiosk Replacement could benefit transportation flow and parking conditions between the South Entrance and Wawona, thereby reducing the park's overall transportation management burdens.

### ***Reasonably Foreseeable Future Actions***

The following is a list of cumulatively considerable, reasonably foreseeable future actions concerning park operations and facilities:

- Development of the new Concessioner Prospectus could increase or decrease demands for administrative facilities, housing, utilities, and overall operational burden, depending on its terms.
- Completion of the forthcoming *Yosemite Wilderness Stewardship Plan/EIS* would reduce operational burdens by providing clearer and more up-to-date direction with regard to resource and visitor management within wilderness areas of the park.
- Future ecological restoration projects may temporarily increase the operational burdens of restoration efforts in these areas.

### ***Overall Cumulative Impact***

As discussed previously, Alternative 1 does not propose any changes to existing park and concessioner operations and facilities. Past actions have had an overall beneficial, however temporary, effect on housing demand. Present activities have the potential to reduce transportation- and utilities-related operational burdens, and provide for new housing opportunities outside of the park. Reasonably foreseeable actions may mitigate some of the operational burden of increasing visitation through transportation management solutions, updated direction with regard to wilderness management, and a clearer perspective of the future role of the primary park concessioner. The cumulative effect of these actions, when considering those of Alternative 1, would be long-term, negligible, and beneficial.

### ***Environmental Consequences Common to Alternatives 2–6***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Corridorwide actions to protect and enhance river values that would occur across Alternatives 2–6 involve restoration and protection of the channel itself, meadow and riparian habitats, and upland vegetation. These include restoration of six miles of informal trails, removal of abandoned underground infrastructure, improvement of river access points, and the removal of riprap, among other activities. River values would also be protected by increased interpretation and outreach concerning river use and natural and cultural resources. The planning, environmental analysis, design, construction/removal, restoration, and monitoring activities associated with these individual management actions would temporarily disrupt the regular work of park staff, resulting in short-term impacts on parkwide operations ranging from negligible to moderate and adverse. While these measures would reduce or eliminate ongoing and/or future impacts on park resources and infrastructure, the park would still incur a long-term, minor to moderate, adverse impact associated with restoration management and monitoring.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values across all segments under Alternatives 2–6 include removing 3,400 feet of riprap from the river bank and revegetating with riparian species, and replacing an additional 2,300 feet of riprap with bioengineered riverbank stabilization devices. This work would require the use of heavy equipment, including loaders and dump trucks. The removal, transport, disposal, restoration, and monitoring work associated with these actions would require several weeks of park staff time to implement, but would not substantially disrupt other ongoing construction, demolition, and restoration activities in the valley and beyond. As a result, these actions would result in a short-term, parkwide, minor, adverse impact on park operations.

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

The park does not propose any measures to manage visitor use and facilities across Segments 1–8 that would occur across Alternatives 2–6.

## **Segments 1, 5, and 8: Merced River Above Nevada Fall, and Merced River Above and Below Wawona**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, the park would undertake measures to eliminate impacts on natural and cultural resources in the vicinity of Merced Lake Backpackers Campground and Merced Lake High Sierra Camp (Segment 1) and archaeological resource site CA-MRP-0218 (Segment 5). Such measures would include prohibiting grazing and restoring denuded areas associated with informal trails. These actions, including the planning and follow-up monitoring, would likely require the commitment of several staff from across numerous park divisions and the use of pack stock, for a period of several days to several weeks. However, because these measures are consistent with the types of management activities staff from these divisions typically perform, the short-term impact on park operations would be negligible and adverse. Park staff would experience a long-term, negligible, adverse operational impact associated with maintenance and monitoring of restoration areas.

**Segments 1, 5, and 8 Impact Summary:** Actions to protect and enhance river values would result local, long-term, negligible, adverse impacts on park operations and facilities.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values that would occur in Yosemite Valley under Alternatives 2–6 involve removal of abandoned infrastructure and other development affecting the Merced River’s hydrologic function, extensive meadow restoration, and management of high visitor-use areas to address associated impacts on riparian habitats and sensitive cultural resources. Removal of abandoned or obsolete infrastructures would reduce ongoing impacts on meadow hydrology and lessen channel scour. Upland restoration activities, including removal of informal trails, roadbeds, and parking areas, would improve meadow health. Development of a management plan for archeological sites, preparation of outreach materials, and imposition of use restrictions in sensitive areas would reduce ongoing impacts on cultural resources. The demolition, removal, transport, disposal, restoration, and monitoring work associated with these actions would require a substantial amount of park staff time and resources, and would likely disrupt other ongoing construction, demolition, and restoration activities in the valley and beyond. As a result, these actions would result in a short-term, moderate, adverse impact on park operations. These efforts would reduce the long-term staff burden associated with managing these ongoing impacts. However, the follow-up restoration monitoring and maintenance would continue to impose a long-term, negligible, adverse impact on park operations.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values within Segment 2 under Alternatives 2–6 include: restoring 4.5 acres of riparian habitat in the area of Yosemite Lodge, 20 acres in the area of the western portion of the Former Upper Pines Loop Campground, and removal of infrastructure and restoration of a minimum of 19.7 acres at the Former Upper and Lower Pines campgrounds; restoring impacted areas of Ahwahnee Meadow, including removal of tennis courts; improving access and removing infrastructure from riparian areas at

Cathedral Beach, Housekeeping Camp, and Bridal Veil; constructing a boardwalk extension to reduce Sentinel Meadow trampling; fencing and vegetation management at Stoneman Meadow, restoring floodplain habitat at Devil's Elbow, and filling ditches not serving current operational needs. In addition, the park would remove one and repave five pull-outs along El Portal Road. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, removal, transport, disposal, restoration, and monitoring work associated with these actions would require more than one year of park staff time to implement, and would disrupt other ongoing construction, demolition, and restoration activities in the valley and beyond. As a result, these actions would result in a short-term, parkwide, moderate, adverse impact on park operations.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values within Segment 2 under Alternatives 2-6 include: removing the abandoned gauging station at Pohono Bridge, removing the footings and former river gauge base at Happy Isles, and restoring these areas to natural conditions. This work would involve the use of heavy equipment, including excavators, a skid steer, and dump trucks, and require approximately five weeks of staff time to implement. The resulting impact on park operations would be short-term, parkwide, negligible and adverse.

**Cultural Resource Actions.** Specific projects to protect and enhance the river's cultural values that would occur within Segment 2 under Alternatives 2-6 include fencing and/or restricting access to the archeologically significant large bedrock mortar (pounding rock) next to Yosemite Falls Trail. The majority of this work would be completed through the use of hand tools and require a nominal commitment of staff time. As such, the impact on park operations would be short-term, parkwide, negligible, and adverse.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values within Segment 2 under Alternatives 2-6 include: selectively thinning conifers and other vegetation in the vicinities of The Ahwahnee and Meadow, Bridal Veil Falls and West Valley, Cooks and Sentinel Meadows, Curry Village, El Capitan, Housekeeping Camp, Yosemite Lodge, and other areas of the valley; restoring grassland and oak habitat in the areas of Bridalveil Straight; repairing riverbank erosion at Clark's Bridge; and addressing informal trails and trampling at the east end of El Capitan Meadow. Much of this work would be accomplished through the use of hand tools, but could also involve heavy equipment for various handling, transport, and restoration activities. This work would occur over the course of several years and may disrupt other restoration activities. As a result, these projects would have a parkwide, short-term, minor to moderate, adverse impact on park operations.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities within Segment 2 that would occur under each action alternative involve changes to campsites, visitor and administrative facilities, employee housing, and transportation. Each of these actions and their impacts on park operations is summarized below. Their implications for overall park visitation, park employees, housing, and utilities are discussed in the context of the respective alternatives in the subsections that follow.

Under each action alternative, the park would remove or repurpose several visitor-serving facilities, such as the Curry Village Ice Rink; Happy Isles Snack Stand; Yosemite Lodge Post Office, Pool, and Snack Stand; and Bank Building. The park would also construct new campsites and remove campsites from the rockfall hazard zone.

Concessioner employee housing within Yosemite Valley would be affected through the removal of temporary units at the Yosemite Lodge (8 beds), Highland Court (82 beds), Huff House (262 beds), and Boys Town (48 beds). New housing developments would be constructed at Huff House (164 beds), Yosemite Lodge (104 beds), and Lost Arrow (50 beds).

Each action alternative includes actions to improve pedestrian wayfinding and access. The park would also undertake a number of transportation and parking management measures; remediation, redesign, and expansion of existing parking areas; and construction of new parking lots in other areas.

These activities, in addition to the facilities removal and construction described previously, would divert considerable staff time and attention away from other ongoing projects. The work associated with these projects, including the planning, demolition, transport, disposal, and reconstruction of housing, would have a substantial impact on park operations. As such, the park would experience a short-term, moderate, adverse operational impact throughout the design, demolition, and reconstruction phases. While the new facilities would introduce a new operational and maintenance burden, these would be more than offset by the removal of existing structures. For these reasons, park staff would likely experience a long-term, negligible to minor, beneficial impact associated with facilities operation and maintenance.

**Curry Village and Campgrounds.** The park would remove the Happy Isles Snack Stand at Curry Village. At The Ahwahnee, the park would remove the swimming pool and tennis courts; redesign, formalize, and improve drainage within the existing parking lot; and construct a new 50 parking space lot east of the current parking area. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Facilities removal and parking expansion would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 6 and Yosemite Village.** The park would remove from Yosemite Village the Concessioner General Office, Concessioner Garage, and the Arts and Activities Center (Bank Building), and repurpose the Village Sports Shop for public use as a visitor contact station. The park would also construct a new maintenance building near the Government Utility Building. Roadside parking along Sentinel Drive would be removed and Camp 6 parking expanded into the footprint of the Concessioner Garage. To improve visitor access between the Camp 6 area and Village, the park would construct a pathway connecting the new Camp 6 parking lot with the repurposed Village Sports Shop. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Facilities and roadside parking removal would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**West Yosemite Valley.** The park would remove the NPS Volunteer Office, post office, swimming pool, and snack stand. It would also remove old and temporary employee housing (Thousands Cabins and Highland Court) and replace it with new housing. In addition, the park would relocate the Yosemite Lodge maintenance and housekeeping facilities and repurpose the food court. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Facilities removal would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, negligible to minor, beneficial impacts on park operations and facilities.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

To protect and enhance river values within the Merced River gorge and El Portal, the park would remove informal trails, nonessential roads, fill materials, and abandoned infrastructure throughout Segments 3 and 4. It would also develop best management practices for revetment construction and repair throughout the Merced River corridor. The planning and design; demolition, removal, transport, and disposal of waste materials; and restoration of these areas would result in a short-term, negligible to minor, adverse impact on park operations. These efforts would reduce the long-term staff burden associated with managing these ongoing impacts. However, the follow-up restoration monitoring and maintenance would continue to impose a long-term, negligible, adverse impact on park operations.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values within Segment 4 under Alternatives 2-6 include removing asphalt and imported fill from the Abbieville and Trailer Village areas. The project would require the use of a skid steer and dump truck, and take several weeks to complete. The resulting impact on park operations would be short-term, parkwide, negligible and adverse.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values within Segment 3 under Alternatives 2-6 include: selectively thinning conifers in the area of the Cascade Falls viewpoint. Much of this work would be accomplished through the use of hand tools, but could also involve heavy equipment for various handling, transport, and restoration activities. This work would occur over the course of a few days and would not be expected to disrupt other restoration activities. As a result, these projects would have a parkwide, short-term, negligible, adverse impact on park operations.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities within Segments 3 and 4 that would occur under each action alternative involve changes to employee housing and visitor facilities. These actions and their impacts on park operations are summarized below. However, their implications for overall park visitation, park employees, housing, and utilities are discussed below, in the context of the respective alternatives.

Under each alternative, the park would construct infill housing in El Portal Village Center. The park would also construct a restroom for visitor use in Old El Portal. Planning and construction activities associated with this work would have a short-term, minor, adverse impact on park operations. The park would experience a long-term, negligible, adverse operational impact associated with the maintenance and operation of these facilities; and the law enforcement and emergency medical services to accommodate the resulting increase in residential occupants.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would impose a parkwide, long-term, negligible, adverse impact on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, negligible to minor, beneficial impacts on park operations and facilities.

### **Segments 6 and 7: Wawona and Wawona Impoundment**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values that would occur within segments 6 and 7 under Alternatives 2–6 include measures to maintain river flows, manage campground waste, and protect cultural resources.

The park would improve Wawona Campground wastewater and refuse management and facilities, remove abandoned infrastructure, and undertake numerous site-specific management measures to counteract or minimize ongoing impacts on cultural resources. The development and implementation of plans for carrying out these projects would have a short-term, negligible to minor, adverse impact on park operations. These measures would reduce the time and energy park staff spends managing for these impacts. But the park would continue to incur a long-term, negligible to minor, adverse impact associated with associated restoration monitoring and maintenance.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic values within Segment 7 under Alternatives 2–6 include retaining the current water collection and distribution system and implementing the water conservation plan related to the minimum flow analysis for the South Fork Merced River. These actions would be similar to those described under Alternative 1. As such, the impact on park operations would be long-term, parkwide, negligible, and adverse.

**Cultural Resource Actions.** Specific projects to protect and enhance the river's cultural values within Segment 7 under Alternatives 2–6 include removing 7 campsites from Wawona Campground that

cause potential impacts to sensitive archeological resources. This work could require the use of heavy equipment, including an excavator, skid steer, loader, and dump truck. This effort would require approximately one week of staff time to complete. As such, the impact to park operations would be short-term, parkwide, negligible, and adverse.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Actions to manage visitor use and facilities within Segments 6 and 7 that would occur under Alternatives 2–6 involve construction of and improvements to administrative and visitor-serving facilities. These actions and their impacts on park operations are summarized below. However, their implications for overall park visitation, staffing, housing, and utilities are discussed in the context of the respective alternatives in the subsections that follow.

Under Alternatives 2–6, the park would improve river access, restroom, picnic, and bus stops within Wawona. These improvements would have a short-term, negligible to minor, adverse impact on park operations. Over the long-term, park staff would continue to incur a negligible and adverse impact associated with the maintenance and upkeep of these existing and new facilities.

The park would also remove staged materials, abandoned utilities, vehicles, and a parking lot from the riparian buffer at the Wawona Maintenance Yard and restore the area's native ecosystem. It would also remove roadside parking between the Wawona Store and Chilnualna Falls Road. Park operations would incur a short-term, minor, adverse impact associated with the demolition, transportation, disposal, and restoration involved in this effort.

To improve operational efficiency, the park would construct new facilities to house maintenance operations and a new wildland fire station within Segment 7. The planning, design, and construction of these facilities would result in a short-term, minor to moderate, adverse operational impact on park operations. Maintenance of these facilities would impose a long-term, negligible, adverse impact on park staff.

Wawona. The park would redesign the bus stop at the Wawona Store to accommodate increased visitor use. The planning, design, contracting, and monitoring required of this project would have a parkwide, short-term, negligible, adverse impact on park operations.

**Segments 6 & 7 Impact Summary:** Actions to protect and enhance river values would impose a long-term, parkwide, negligible, adverse impact on park operations. Actions to manage user capacities, land use, and facilities would have long-term, parkwide, negligible, adverse impacts on park operations and facilities.

### **Summary of Impacts Common to All Action Alternatives**

Management actions common to Segments 2–6 involve numerous large-scale restoration projects, substantial administrative facilities projects in Yosemite Valley and Wawona, and a considerable change in the valley's supply of temporary employee housing. These actions would improve river values directly through restoration and indirectly through reduced development intensity within the valley. The work associated with these actions would result in a short-term, minor to moderate,



adverse impact on park operations. Such measures would address large-scale problems that, if left to incremental management measures, would otherwise continue to require additional staff time and resources to address. While such actions would reduce operational burdens associated with incremental efforts to address these ongoing impacts, the park would still incur the burdens of restoration area monitoring and maintenance. Nonetheless, the long-term impact of these actions would be negligible to minor and beneficial.

### ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 2, the park would implement a day-use parking permit system for the East Yosemite Valley — checked at entrance gates — to regulate the number of vehicles entering Yosemite Valley during the peak season and potentially into the shoulder seasons. Development, implementation, and maintenance of the system would have a short-term, negligible to minor, adverse impact on park operations. Management of the system would require additional staff time and resources. Over the long-term, however, as the park is better able to regulate traffic entering the valley, the operational burdens associated with managing high volumes of traffic in the valley (i.e., public safety, traffic control, parking assistance, and restoration of impacts surrounding informal parking areas) would be reduced. The result would be a long-term, negligible, beneficial impact on park operations.

#### **Segments 1, 5, and 8: Merced River Above Nevada Fall, and Merced River Above and Below Wawona**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would be reduced through a decrease in the Little Yosemite Valley trailhead quota (from 150 to 25), removal of the Merced Lake High Sierra Camp, and wilderness campground modifications. The resulting decline in wilderness visitation would reduce the park's operational burden associated with visitation-related wilderness restoration. The long-term impact would be minor and beneficial.

Under Alternative 2, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed. These actions would have long-term, minor, beneficial impacts on concessioner operations associated with managing and maintaining these facilities.

The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result from the elimination of designated camping at Moraine Dome and conversion of the Little Yosemite Valley Backpackers Campground to dispersed camping. Dispersed camping at the Merced Lake Backpackers Campground would be increased, but facilities would be

reduced. This would result in a long-term, negligible to minor, beneficial impact on park operations associated with management and maintenance of these facilities.

Removal of the Merced Lake High Sierra Camp and the associated visitor services would eliminate the need for employees to operate the camp. Such a reduction would contribute to the long-term, minor, beneficial impact on concessioner staffing operations. These actions would also eliminate the need for and existence of housing associated with the camp's operation. As such, the proposed actions would not have an impact on concessioner employee housing demand within the Merced River corridor's wilderness.

Demand for utilities within Segment 1 would decrease under Alternative 2. The removal of infrastructure and restoration of these areas would require a temporary, yet substantial commitment of park staff time, resources, and equipment. The work would likely require several months to plan and execute, involve staff across several divisions, and require several pack crews and multiple helicopter flights. The short-term impact on park operations would be minor and adverse. However, the operational burden associated with seasonal set-up, weekly maintenance, and ongoing habitat restoration as a result of high visitation at and around camps would be reduced with their conversion and removal. Thus, the long-term impact on park operations would be minor and beneficial.

**Segment 1 Impact Summary.** Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor, beneficial impacts on park operations and facilities.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area, and rerouting and revegetating a portion of the Valley Loop Trail. The park also proposes to restore 10.9 acres of riparian ecosystem from which cabins were removed after being damaged by the 1997 flood. Undertaking this work would require a considerable amount of park staff time and resources across several management divisions. The work would likely take several weeks to a few months to complete, during which time normal park management activities could be disrupted. The resulting impact to park operations would be short-term, negligible to minor, and adverse. These actions would also benefit parkwide operations because they would lessen the need for future meadow restoration. However, these actions would also increase the need for ongoing monitoring and maintenance of the restoration areas. As such, the proposed actions would have a long-term, negligible, adverse impact on park operations.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values within Segment 2 under Alternative 2 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing campsites and infrastructure from the 100-year floodplain and restoring 25.1 acres of floodplain and riparian habitat; and removing informal trails and informal parking at El Capitan Meadow. This work would require the use of heavy equipment, including

excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require approximately 50 weeks of crew and equipment time over a period of three years. As a result, these projects are likely to disrupt other ongoing maintenance and restoration projects in the valley and beyond. The resulting impact on park operations would be short-term, parkwide, moderate, and adverse.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values within Segment 2 under Alternative 2 include: relocating unimproved Camp 6 parking and rerouting a portion of Northside Drive; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time, during which time other restoration and maintenance activities would be disrupted. The resulting impact on park operations would be short-term, parkwide, moderate, and adverse.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 2, specifically those concerning vehicle access and number of overnight accommodations, would result in a 33% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 13,900. Daytime visitation would decrease by 5,400 (36%), while overnight visitation would decrease by 1,600 (26%). The resulting impact on staffing and other resources required to restore areas affected by high visitor use, manage traffic, and maintain visitor-serving facilities would be long-term, minor, and beneficial.

Under Alternative 2, there would be a 46% net reduction in valley lodging units. Contributing to this decline would be removal of units from Housekeeping Camp, conversion of the Yosemite Lodge to a day use facility, and an increase in units at Curry Village, such that valley lodging units would total 556. These actions would have a long-term, moderate, beneficial impact on concessioner operations associated with management and maintaining these facilities.

The park would reduce the total number of campsites within the valley to 450 (a decrease of 3%). This change stems largely from campsite removals at Upper Pines, Lower Pines, and North Pines campgrounds, and additions at Yosemite Lodge. This would result in a long-term, negligible, beneficial impact on park operations associated with management and maintenance of these facilities.

Concessioner employee housing within Yosemite Valley would be reduced by 57% — from 1,151 beds to 494 beds. This reduction would have a detrimental effect on the supply of housing within Segment 2. The demand for utilities would decrease with the removal of employee housing, lodging units, and campgrounds, and the decrease in overnight visitation. With the decrease in staffing required for concessioner operations, the demand for valley administrative facilities would also be expected to decrease.

Construction activities under Alternative 2 would include the removal work described above, as well as parking improvements at Curry Village and Camp 6, as well as new camping and parking facilities at Yosemite Lodge. The planning, demolition, design, construction, and restoration activities associated

with this work would impose a short-term, minor to moderate, adverse impact on park operations. The park would also incur long-term, negligible, adverse operational burdens associated with the maintenance and operation of these new facilities.

**Curry Village and Campground.** The park would construct 78 new hard-sided units in Boys Town, bringing the total number of new and retained units at Curry Village to 433. The park would remove campsites from Lower Pines (32), North Pines (86), and Upper Pines (24). In addition, the park would discontinue commercial day rides from the Curry Village Stables. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor to moderate, and adverse. Facilities removal and replacement of old guest units would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, outside of the dynamic 10-year floodplain, and install walkways leading to Yosemite Village. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor to moderate, and adverse. Increased parking efficiency would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing Camp 4 and Yosemite Lodge. The park would convert the Highland Court area to a walk-in campground; reconfigure pedestrian crossing of Northside Drive and Yosemite Lodge Drive, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor, and adverse. Increased parking would have a long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor to moderate, beneficial impacts on park operations and facilities.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 2.25-acre oak recruitment zone in the vicinity of Odgers fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. Development

and implementation of such protective measures would have a short-term, negligible, adverse effect on normal staff operations. The consequent long-term impact on park operations associated with enforcement of these restrictions and monitoring the restoration areas would be negligible and adverse.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 3 and 4 involve the development of housing and campsites within Segment 4. These actions, in combination with those that would occur under Alternatives 2–6, would not be expected to have an appreciable impact on park visitation.

New high-density concessioner housing would be constructed in Abbieville and Rancheria, outside the 100-year floodplain. In addition, as previously noted, under “Impacts of Actions Common to All Segments for Alternatives 2–6,” new housing would also be constructed in El Portal Village Center. This would increase the total number of concessioner-assigned housing units within El Portal from 192 to 618. These actions would have a beneficial impact on new and existing employees of El Portal because they would increase housing opportunities in an area of high demand.

Demand for utilities and administrative facilities within segment 4 would increase under Alternative 2. The park would experience a short-term, moderate, adverse operational impact associated with the planning, design, relocation, and construction of the projects described above. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the resulting increase in residential occupants.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor, adverse impacts on park operations and facilities.

### **Segments 6 and 7: Wawona and Wawona Impoundment**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values within Segment 7 include removal of the Wawona Golf Course. The work associated with this project would noticeably but temporarily disrupt the work of park staff. As such, the undertaking would have a short-term, minor, adverse impact on park operations. While the time and expense associated with maintaining this facility would be reduced with its removal, park staff would still incur a long-term, negligible to minor, adverse operational burden associated with monitoring and maintenance of these restoration areas.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values within Segment 7 under Alternative 2 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew time. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions, in combination with those that would occur under Alternatives 2–6, would be expected to effect a nominal decrease in overall visitation within this Segment 7.

Implementation of Alternative 2 management actions would reduce the demand for employee housing within Segment 7. Demand for utilities and administrative facilities within Segment 7 would similarly decrease under Alternative 2. Fewer visitors would mean less draw upon the town's utilities. In addition, the new facilities for maintenance and firefighting staff operations proposed for Alternatives 2–6 would be expected to include high-efficiency fixtures, further reducing the demand for utilities. The construction of new facilities would also reduce demand for administrative space within this segment. The park would experience a short-term, minor, adverse operational impact associated with the planning and execution of projects proposed under Alternative 2. These actions would result in a long-term, minor, adverse impact on park operations associated with restoration monitoring and maintenance.

**Wawona Campground:** Under Alternative 2, the park would reduce the size of the Wawona Campground. Thirty-two campsites, or 33% of all campsites within Wawona, would be removed from the floodplain. This would result in a long-term, parkwide, minor, beneficial impact on park operations required to manage and maintain these facilities.

**Segments 6 & 7 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible to minor, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor, adverse impacts on park operations and facilities.

**Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Under Alternative 2, park staff would carry out a substantial amount of restoration throughout the Merced River corridor. These actions would considerably reduce the long-term operational burden associated with ongoing incremental resource management and maintenance activities. In addition, the park would undertake a considerable number of actions related to transportation management and commercial services. For example, the park would implement a day-use parking permit system for the East Yosemite Valley to help manage a reduced Yosemite Valley parking supply. In addition, the park would substantially reduce the number of lodging units (-46%) and campsites (-3%) within the valley. These actions would decrease Yosemite Valley visitation by an estimated 33%, with similar decreases in both daytime and overnight visitation. Concessioner-assigned housing would also decrease under Alternative 2, with a substantial shift in housing from the valley to El Portal. Under Alternative 2, demands for administrative space, utilities, and housing would be expected to decrease parkwide. However, with the proposed shift in housing and facilities from the valley to El Portal, the latter would experience a considerable increase in demand for these facilities and services. The long-term impacts on park operations and facilities would be parkwide, minor to moderate, and beneficial.

## **Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Cumulatively considerable projects that could affect park facilities and operations are the same as those identified for Alternative 1, and include past, present, and reasonably foreseeable actions in the Yosemite region.

### ***Overall Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

The cumulative impacts of Alternative 2 management measures, in combination with those common to Alternatives 2-6, would generally be beneficial. Past and present facilities improvements and upgrades would reduce the operational demands on park staff to maintain these assets. For the same reason, park operations would similarly benefit from past and present habitat restoration and resource management projects and plans. Continued implementation of the *East Yosemite Valley Utilities Improvement Plan/EA* would further reduce demands for park utilities. As a result, the cumulative impact of Alternative 2 management measures, in light of past, present, and reasonably foreseeable future projects, would be long-term, moderate, and beneficial.

## ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 3, the park would implement a day-use parking permit system for East Yosemite Valley, checked on-site at parking areas, to regulate the number of vehicles entering Yosemite Valley during the peak season and potentially into the shoulder seasons. Development, implementation, and maintenance of the system would have a short-term, negligible impact on park operations. While management of the system would require additional staff time and resources; over the long-term, as the park is better able to regulate traffic entering the valley, the operational burdens associated with managing high volumes of traffic in the valley (i.e., public safety, traffic control, parking assistance, and restoration of impacts surrounding informal parking areas) would be reduced. The result would be a long-term, negligible, adverse impact on park operations.

### **Segments 1, 5, and 8: Merced River Above Nevada Fall, and Merced River Above and Below Wawona**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would be reduced through reductions in the Little Yosemite Valley trailhead quota (from 150 to 75), closure of the Merced Lake High Sierra Camp, and wilderness campground modifications. The resulting decline in wilderness visitation would reduce the park's

operational burden associated with visitation-related wilderness restoration. The long-term impact would be negligible to minor and beneficial.

Under Alternative 3, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed. The area would temporarily be used as a pack camp for up to 15 people. These actions would have a long-term, negligible to minor, beneficial impact on concessioner operations associated with managing and maintaining these facilities.

The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result primarily from the decrease in designated camping in Little Yosemite Valley. This would result in a long-term, negligible, beneficial effect on park operations associated with management and maintenance of these facilities.

Removal of the Merced Lake High Sierra Camp, and the associated visitor services, would eliminate the need for employees to operate the camp. Such a reduction would contribute to the long-term, negligible, beneficial impact on concessioner staffing operations. These actions would also eliminate the need for and existence of housing associated with the camp's operation. As such, the proposed actions would not have an impact on concessioner employee housing demand within the Merced River corridor's wilderness.

The removal of infrastructure and restoration of these camps would require a substantial temporary commitment of park staff time, resources, and equipment. The work would likely require several months to plan and execute, involve staff across several divisions, and require several pack crews and multiple helicopter flights. The short-term impact on park operations would be minor and adverse. However, the operational burden associated with seasonal set-up, weekly maintenance, and ongoing habitat restoration as a result of high visitation at and around these camps would be reduced with their conversion and removal. Thus, the long-term impact on park operations would be negligible to minor and beneficial.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have parkwide, long-term, negligible to minor, beneficial impacts on park operations and facilities.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removal of buildings from the Yosemite Lodge area, and rerouting and revegetating a portion of the valley Loop Trail. The park also proposes to restore 10.9 acres of riparian ecosystem from which cabins were removed after being damaged by the 1997 flood. Undertaking this work would require a considerable amount of park staff time and resources across several management divisions. The work would likely require several weeks to a few months to complete, during which time normal park management activities could be disrupted. The resulting impact to park operations would be short-term, negligible to minor, and adverse. These actions would also benefit parkwide operations because they would lessen the need for future meadow



restoration. However, these actions would also increase the need for ongoing monitoring and maintenance of the restoration areas. As such, the proposed actions would have a long-term, negligible, adverse impact on park operations.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values within Segment 2 under Alternative 3 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; and removing campsites and infrastructure from the 100-year floodplain and restoring 12 acres of floodplain and riparian habitat; and erecting fencing and signage to redirect visitor traffic, and removing informal trails at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require approximately 36 weeks of crew and equipment time over a period of two years. As a result, these projects are likely to disrupt other ongoing maintenance and restoration projects in the valley and beyond. The resulting impact on park operations would be short-term, parkwide, moderate, and adverse.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 3 include: relocating unimproved Camp 6 parking; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time over a period of two years, during which other restoration and maintenance activities would be disrupted. The resulting impact on park operations would be short-term, parkwide, moderate, and adverse.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 3, specifically those concerning vehicle access and number of overnight accommodations, would result in a 37% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 13,200. Daytime visitation would decrease by 6,300 (43%), while overnight visitation would decrease by 1,400 (23%). The resulting impact on staffing and other resources required to restore areas affected by high visitor use, manage traffic, and maintain visitor-serving facilities would be long-term, minor, and beneficial.

Under Alternative 3, there would be a 40% net reduction in Yosemite Valley lodging units. This is largely due to the removal of units from Housekeeping Camp, Curry Village, and Yosemite Lodge, bringing total valley lodging down to 621 units. These actions would have a long-term, minor to moderate, beneficial impact on concessioner operations associated with managing and maintaining these facilities.

The park would increase the total number of campsites within the valley to 477 (an increase of 2%). This change is largely due to new campsite development east of Camp 4, west of Backpackers Campground, and in the Upper Pines Loop Addition. This increase would result in a long-term,

negligible, adverse operational impact on park staff associated with maintenance and operation of these facilities.

Concessioner employee housing within the valley would be reduced by 20% — from 1,151 beds to 922 beds. Due to the anticipated reduction in need for concessioner employees to staff reduced visitor serving operations, this net reduction would not have a substantial effect on the supply of housing within Segment 2. The demand for utilities would decrease with the removal of employee housing and lodging units, and the decrease in overnight visitation. With relocation of the Concessioner General Office, and the decrease in staffing required for concessioner operations, the demand for valley administrative facilities would also be expected to decrease.

Construction activities under Alternative 3 would include the removal work described above, as well as parking improvements; new housing development; new camping facilities east of Camp 4 and at Upper Pines Campground; and several small transit and pedestrian access improvements. The planning, demolition, design, construction, and restoration activities associated with this work would have a short-term, minor to moderate, adverse impact on park operations. The park would also incur a long-term, negligible, adverse operational burden associated with the maintenance and operation of these new facilities.

**Curry Village and Campground.** The park would retain 355 guest units at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor, and adverse. Facilities removal would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor to moderate, and adverse. Increased parking efficiency would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced transportation management burdens.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing to west of the Northside Drive and Yosemite Lodge Drive, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor, and adverse. The reconfiguration of the

pedestrian crossing and increased parking would have long-term, negligible, beneficial impact on park operations through reduced transportation management burdens.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor to moderate, beneficial impacts on park operations and facilities.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 2.25-acre oak recruitment zone in the vicinity of Odgers fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. Development and implementation of such protective measures, including the removal of nonnative fill, decompaction of soils, and replanting the oak tree understories in the vicinity of these zones, would have a short-term, negligible, adverse effect on normal staff operations. The consequent long-term impact on park operations associated with enforcement of these restrictions and monitoring the restoration areas would be negligible and adverse.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 3 and 4 involve the development of housing and campsites within Segment 4. These actions, in combination with those that would occur under Alternatives 2–6, would not be expected to have an appreciable impact on park visitation.

New low- and medium-density housing would be constructed as infill development in Rancheria, outside the 100-year floodplain. As previously noted, under each alternative new housing would also be constructed in El Portal Village Center. This would increase the total number of concessioner-assigned housing units within El Portal from 192 to 223. These actions would have a beneficial impact on new and existing employees of El Portal because they would increase housing opportunities in an area of high demand.

Demand for utilities and administrative space within Segment 4 would increase under Alternative 3. The park would experience a short-term, minor, adverse operational impact associated with the planning, design, relocation, and construction of the projects described above. These actions would also result in a long-term, negligible, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the resulting increase in residential occupants.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user

capacities, land use, and facilities would have parkwide, long-term, negligible, adverse impacts on park operations and facilities.

## **Segments 6 and 7: Wawona and Wawona Impoundment**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values within Segment 7 include removal of the Wawona Golf Course. The work associated with this project, including removal of turf and infrastructure, as well as subsequent decompaction and restoration, would noticeably but temporarily disrupt the work of park staff. As such, the project would have a short-term, minor impact on park operations. While the time and expense associated with maintaining this facility would be reduced with their removal, park staff would still incur a long-term, negligible, adverse operational burden associated with monitoring and maintenance of these restoration areas.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew time. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions, in combination with those that would occur under Alternatives 2–6, would be expected to effect a nominal decrease in overall visitation within this Segment 7.

Implementation of Alternative 3 management actions would reduce demand for employee housing within Segment 7. Demand for utilities and administrative facilities within Segment 7 would slightly decrease under Alternative 3. Fewer visitors would mean less draw upon the town's utilities. In addition, the new facilities for maintenance and firefighting staff operations proposed for Alternatives 2–6 would be expected to include high-efficiency fixtures, further reducing the demand for utilities. The construction of new facilities would also reduce demand for administrative space within this segment. The park would experience a short-term, minor, adverse operational impact associated with the planning and execution of projects proposed under Alternative 3. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.

**Wawona Campground.** Under Alternative 3, the park would reduce the size of the Wawona Campground. Twenty seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. This would result in a long-term, negligible to minor, beneficial impact on park operations required to manage and maintain these facilities.

**Segments 6 & 7 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible to minor, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, minor, adverse impacts on park operations and facilities.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Under Alternative 3, park staff would carry out a substantial amount of restoration throughout the Merced River corridor. These actions would considerably reduce the long-term operational burden associated with ongoing incremental resource management and maintenance activities. In addition, the park would undertake a considerable number of actions related to transportation management and commercial services. For example, the park would implement a day-use parking permit system for East Yosemite Valley to manage the reduction in Yosemite Valley parking supply. In addition, the park would substantially reduce the number of lodging units (-40%) but increase the number of campsites (2%) within the valley. These actions would decrease valley visitation by an estimated 37%, with similar decreases in both daytime and overnight visitation. Concessioner-assigned housing would also decrease under Alternative 3, with the largest reduction seen in the valley and a slight increase in El Portal. Under Alternative 3, demands for administrative space, utilities, and housing would be expected to decrease parkwide. However, with the proposed shift in housing and facilities from the valley to El Portal, the latter would experience a slight increase in demand for these facilities and services. The long-term impacts on park operations and facilities would be parkwide, minor to moderate, and beneficial.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Cumulatively considerable projects that could affect park facilities and operations are the same as those identified in Alternative 2, and include past, present, and reasonably foreseeable actions in the Yosemite region.

### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

The cumulative impacts of Alternative 3 management measures, in combination with actions common to Alternatives 2-6, would generally be beneficial. Past and present facilities improvements and upgrades would reduce the operational demands on park staff to maintain these assets. For the same reason, park operations would similarly benefit from past and present habitat restoration and resource management projects and plans. As previously noted, continued implementation of the *East Yosemite Valley Utilities Improvement Plan/EA* would further reduce demands for park utilities. As a result, the cumulative impact of Alternative 3 management measures, in light of past, present, and reasonably foreseeable future projects, would be long-term, moderate, and beneficial.

## ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 4, the park would implement a real-time, adaptive day-use traffic and parking management program, utilizing fee structures, transit service expansion, and managed access and diversions. Development, implementation, and maintenance of the system would have a short-term, minor, adverse impact on park operations. Management of the various components of this system over the long-term would require a long-term commitment of staff time and resources. However, as park staff is better able to manage traffic throughout Yosemite Valley, the operational burdens associated with managing high volumes of traffic in the valley (i.e., public safety, traffic control, parking assistance, restoration of impacts surrounding informal parking areas) would be reduced. The result would be a long-term, negligible to minor, adverse impact on parkwide operations.

### **Segments 1, 5, and 8: Merced River Above Nevada Fall, and Merced River Above and Below Wawona**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would be reduced through reductions in the Little Yosemite Valley trailhead quota (from 150 to 100), closure of the Merced Lake High Sierra Camp, and wilderness campground modifications. The resulting decline in wilderness visitation would reduce the park's operational burden associated with visitation-related wilderness restoration. The long-term impact would be negligible and beneficial.

Under Alternative 4, there would be a 100% reduction in the Merced River corridor's wilderness lodging units. All 60 units and associated facilities at the Merced Lake High Sierra Camp would be removed. These actions would have a long-term, minor, beneficial impact on concessioner operations associated with managing and maintaining these facilities.

The park would reduce the total number of designated campsites within the corridor's wilderness. This change would result primarily from the decrease in designated camping at Little Yosemite Valley Backpackers Campground and removal of bear boxes (composting toilet remains). Designated camping at Moraine Dome would continue and dispersed camping at the Merced Lake Backpackers Campground would be expanded, but facilities would be reduced (i.e., flush toilets and wastewater system would be replaced with composting toilets and bear boxes removed). This would result in a long-term, negligible, beneficial impact on park operations associated with management and maintenance of these facilities.

Removal of the Merced Lake High Sierra Camp, and the visitor services associated therewith, would eliminate the need for employees to operate the camp. Such a reduction would contribute to the long-term, negligible, and beneficial impact on concessioner staffing operations. These actions would also

eliminate the need for and existence of housing associated with the camp's operation. As such, the proposed actions would not have an impact on concessioner employee housing demand within the Merced River corridor's wilderness.

The removal of infrastructure and restoration of these camps would require a temporary, yet substantial commitment of park staff time, resources, and equipment. The work would likely require several months to plan and execute, involve staff across several divisions, and require several pack crews and multiple helicopter flights. The short-term impact on park operations would be minor and adverse. However, the operational burden associated with seasonal set-up, weekly maintenance, and ongoing habitat restoration as a result of high visitation at and around these camps would be reduced with their conversion and removal. Thus, the long-term impact on park operations would be negligible to minor and beneficial.

**Segment 1 Impact Summary.** Actions to manage user capacities, land use, and facilities would have parkwide, long-term, negligible to minor, beneficial impacts on park operations and facilities.

## **Segment 2: Yosemite Valley**

### *Impacts of Actions to Protect and Enhance River Values*

Projects proposed in Segment 2 to protect and enhance river values involve rerouting and revegetating a portion of the valley Loop Trail. The park also proposes to restore 10.9 acres of riparian ecosystem from which cabins were removed after being damaged by the 1997 flood. The work would likely take a few weeks to complete, but would not likely disrupt normal park management activities. The resulting impact to park operations would be short-term, negligible, and adverse. The project would benefit parkwide operations because it would lessen the need for future meadow restoration. However, these actions would also increase the need for ongoing monitoring and maintenance of the restoration areas. As such, the proposed actions would have a long-term, negligible, adverse impact on park operations.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values within Segment 2 under Alternative 4 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing campsites and infrastructure from the 100-year floodplain and restoring 12 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 20 weeks of crew and equipment time over a period of at least two years. As a result, these projects are likely to disrupt other ongoing maintenance and restoration projects in the valley and beyond. The resulting impact on park operations would be short-term, parkwide, minor to moderate, and adverse.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values within Segment 2 under Alternative 4 include: relocating unimproved Camp 6 parking; placing large wood and engineered logjams along the base of Stoneman Bridge;

removing the Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time over a period of two years, during which other restoration and maintenance activities would be disrupted. The resulting impact on park operations would be short-term, parkwide, moderate, and adverse.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Actions to manage visitor use and facilities under Alternative 4, specifically those concerning vehicle access, would result in a 19% decrease in daily Yosemite Valley visitation, from approximately 20,900 to 17,000. Daytime visitation would decrease by nearly 4,300 (29%). However, due in part to increases in campground facilities, overnight visitation would increase by about 400 (7%). The resulting impact on staffing and other resources required to restore areas affected by high visitor use, manage traffic, and maintain visitor-serving facilities would be long-term, minor, and beneficial.

Under Alternative 4, there would be an 20% net reduction in valley lodging units. This would be achieved through removal of units from Housekeeping Camp and Curry Village, bringing the total number of valley lodging units down to 823. These actions would have a long-term, minor, beneficial impact on concessioner operations associated with operating and maintaining these facilities.

The park would increase the total number of campsites within the valley to 701 (an increase of 50%). This increase would be largely due to the development of new campsites near Yosemite Lodge (west) and Camp 4 (east), as well as at Boys Town, Upper Pines Campground, Curry Village stables, and the former Upper River and Lower River campgrounds. This would result in a long-term, moderate, adverse impact on concessioner operations associated with managing and maintaining these facilities.

Concessioner employee housing within Yosemite Valley would be reduced by 20% — from 1,151 beds under Alternative 1 to 923 beds. This reduction would have a detrimental effect on the supply of housing within Segment 2. The demand for utilities would decrease with removal of employee housing and lodging units. Despite the increase in overnight visitation and addition of campgrounds, the net reduction in visitation would be expected to offset any associated increase in demand. With the decrease in staffing required for concessioner operations, the demand for valley administrative facilities would also be expected to decrease.

Construction activities under Alternative 4 would include the removal work described above, as well as parking improvements, new housing development at Yosemite Lodge, and new campsites at several locations. In addition, the park would undertake numerous actions to improve transit and pedestrian flows. The planning, demolition, design, construction, and restoration activities associated with this work would have a short-term, moderate, adverse impact on park operations. The park would also incur long-term, negligible, adverse operational burdens associated with the maintenance and operation of these facilities.

**Curry Village and Campground.** The park would retain 355 guest units and construct a new 40 site campground at Curry Village. The park would remove campsites from Lower Pines (15), North Pines (34), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the



Curry Village Stables. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor, and adverse. Despite the installation of new campsites, facilities removal would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 6 and Yosemite Village.** The park would improve the configuration of and on-grade pedestrian crossing at the Northside Drive-Yosemite Village Drive intersection, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 750 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive to improve traffic flow and alleviate congestion. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor to moderate, and adverse. Increased parking and improved intersection performance would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Increased parking and improved traffic conditions would have a long-term, negligible, beneficial impact on park operations through reduced transportation management burdens.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, minor, beneficial impacts on park operations and facilities.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 1-acre oak recruitment zone in the vicinity of Odgers fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. Development and implementation of such protective measures would have a short-term, negligible, adverse impact on normal staff operations. The consequent long-term impact on park operations associated with enforcement of these restrictions and monitoring the restoration areas would be negligible and adverse.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 3 and 4 involve the development of housing and campsites within Segment 4. These actions, in combination with those that would occur under Alternatives 2–6, would not be expected to have an appreciable impact on park visitation.

New high-density concessioner housing would be constructed in Rancheria, outside the 100-year floodplain. In addition, as previously noted, under each alternative new housing would also be constructed in El Portal Village Center. This would increase the total number of concessioner-assigned housing units within El Portal from 192 to 300. These actions would have a beneficial impact on new and existing employees of El Portal because they would increase housing opportunities in an area of high demand.

Demand for utilities and administrative space within Segment 4 would increase under Alternative 4. The park would experience a short-term, minor to moderate, adverse operational impact associated with the planning, design, relocation, and construction of the projects described above. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the resulting increase in residential occupants.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor, adverse impacts on park operations and facilities.

**Segments 6 and 7: Wawona and Wawona Impoundment*****Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values within Segment 7 under Alternative 4 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew time. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions, in combination with those that would occur under Alternatives 2–6, would be expected to effect a nominal decrease in overall visitation within Segment 7.

Implementation of Alternative 4 would not be expected to affect demand for employee housing within Segment 7. Demand for utilities and administrative facilities within Segment 7 would slightly decrease under Alternative 4. Fewer visitors would mean less draw upon the town's utilities. In addition, the

new facilities for maintenance and firefighting staff operations proposed for Alternatives 2–6 would be expected to include high-efficiency fixtures, further reducing the demand for utilities. The construction of new facilities would also reduce demand for administrative space within this segment. The park would experience a short-term, negligible to minor, adverse operational burden associated with the planning and execution of projects proposed under Alternative 4. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.

**Wawona Campground.** Under Alternative 4, the park would reduce the size of the Wawona Campground. Twenty-seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. This would result in a long-term, negligible to minor, beneficial impact on park operations required to manage and maintain these facilities.

**Segments 6 & 7 Impact Summary:** Actions to protect and enhance river values would result in parkwide, short-term, negligible, adverse impacts on park operations. These actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, negligible, adverse impacts on park operations and facilities.

#### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Under Alternative 4, park staff would carry out a substantial amount of restoration throughout the Merced River corridor. These actions would considerably reduce the long-term operational burden associated with ongoing incremental resource management and maintenance activities. In addition, the park would undertake a considerable number of actions related to transportation management and commercial services. For example, the park would implement a real-time traffic and parking management program, and reduce Yosemite Valley parking capacity. In addition, the park would substantially reduce the number of lodging units (-20%) but increase the number of campsites (50%) within the valley. These actions would decrease total Yosemite Valley visitation by an estimated 19%, while overnight visitation would increase. Concessioner-assigned housing would also decrease under Alternative 4, with the largest reduction seen in the valley, and a substantial increase in El Portal. Under Alternative 4, demands for administrative space, utilities, and housing would be expected to decrease parkwide. However, with the proposed shift in housing and facilities from the valley to El Portal, the latter would experience a considerable increase in demand for these facilities and services. The long-term impact on park operations and facilities would be minor, and beneficial.

#### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Cumulatively considerable projects that could affect park facilities and operations are the same as those identified in Alternative 2, and include past, present, and reasonably foreseeable actions in the Yosemite region.

### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

The cumulative impacts of Alternative 4 management measures, in combination with those common to Alternatives 2-6, would generally be beneficial. Past and present facilities improvements and upgrades would reduce the operational demands on park staff to maintain these assets. For the same reason, park operations would similarly benefit from past and present habitat restoration and resource management projects and plans. As previously noted, continued implementation of the *East Yosemite Valley Utilities Improvement Plan/EA* would further reduce demands for park utilities. As a result, the cumulative impact of Alternative 4 management measures, in light of past, present, and reasonably foreseeable future projects, would be long-term, minor to moderate, and beneficial.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### **All River Segments**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 5, the park would implement a phased-in, adaptive day-use traffic and parking management program, which would utilize permits, fee structures, transit service expansion, and managed access and diversions. Development, implementation, and maintenance of the system would have a long-term, minor to moderate, adverse impact on park operations. Management of the system would require a long-term commitment of staff time and resources. However, once the program was operational, and as park staff was better able to regulate traffic throughout Yosemite Valley, the operational burdens associated with the present practice of managing high volumes of traffic in the valley (i.e., public safety, traffic control, parking assistance, and restoration of impacts surrounding informal parking areas) would be reduced. The result would be a long-term, minor, adverse impact on park operations.

#### **Segments 1, 5, and 8: Merced River Above Nevada Fall, and Merced River Above and Below Wawona**

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would not be expected to change appreciably under Alternative 5; wilderness access quotas would remain as under Alternative 1 (No Action) (150) and modifications to overnight accommodations would be nominal. As such, the park's operational burden associated with visitation-related wilderness restoration would remain similar to that of Alternative 1. The long-term impact would be negligible to minor and adverse.

Under Alternative 5, the Merced Lake High Sierra Camp would remain in operation and continue to host overnight guests and through-hikers during the summer months. However, the camp's 60 units would be reduced to 42. The operational burden associated with seasonal set-up, weekly maintenance, and habitat restoration necessary to address impacts of high visitation at and around these camps

would be slightly reduced from that of Alternative 1. The resulting impact would be long-term, negligible to minor, and adverse.

The park would not reduce the total number of designated campsites within the Merced River corridor's wilderness. Designated camping at Moraine Dome and Little Yosemite Valley Backpackers Campground would continue. The Merced Lake Backpackers Campground would remain. The long-term impact associated with maintenance of these new facilities, however reduced, would continue to be negligible and adverse.

The primary park concessioner would continue to experience a long-term, negligible, adverse impact associated with staffing the Merced Lake High Sierra Camp operations. The need for employee housing units for these staffers would also continue. As under Alternative 1, the camp would keep eight concessioner employee beds. As such, implementation of Alternative 5 would not be expected to affect concessioner employee housing demand within the corridor's wilderness segments.

The facilities removal and restoration activities that would occur under Alternative 5 would divert staff time and attention away from other ongoing projects. They would likely take several weeks to months to plan and execute, involve staff across several divisions, and require multiple helicopter flights. The short-term impact on park operations would be negligible to minor and adverse. The long-term operational impact associated with the monitoring and maintenance of these restoration areas would be negligible and adverse.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have parkwide, long-term, negligible, adverse impacts on park operations and facilities.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. The park also proposes to restore 10.9 acres of riparian ecosystem from which cabins were removed after being damaged by the 1997 flood. The work would take several weeks to complete, but would not likely disrupt normal park management activities. The resulting impact to park operations would be short-term, and adverse. The project would benefit parkwide operations because it would lessen the need for future meadow restoration. However, these actions would also increase the need for ongoing monitoring and maintenance of the restoration areas. As such, the proposed actions would have a long-term, negligible, adverse impact on park operations.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values within Segment 2 under Alternatives 5 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; reconfiguring the Curry Orchard parking lot; removing campsites and infrastructure from the 100-year floodplain and restoring 6.5 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails at El Capitan Meadow. This work

would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 28 weeks of crew and equipment time over a period of two years. As a result, these projects are likely to disrupt other ongoing maintenance and restoration projects in the valley and beyond. The resulting impact on park operations would be short-term, parkwide, moderate, and adverse.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 5 include: relocating unimproved Camp 6 parking; removing the Sugar Pine Bridge; placing large wood and engineered logjams along the base of Stoneman Bridge; and improving trail connectivity and routing in the vicinity of the Ahwahnee Bridge. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require at least 16 weeks of crew and equipment time over a period of two years, during which other restoration and maintenance activities could be disrupted. The resulting impact on park operations would be short-term, parkwide, minor to moderate, and adverse.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Actions to manage visitor use and facilities under Alternative 5, specifically those concerning vehicle access and overnight accommodations, would result in a 5% decrease in daily Yosemite Valley visitation, from approximately 20,900 under Alternative 1 to 19,900. Daytime visitation would decrease by nearly 2,000 (14%). However, due largely to increases in lodging and campground facilities, overnight visitation would increase by about 1,000 (16%). The resulting impact on staffing and other resources required to restore areas affected by high visitor use, manage traffic, and maintain visitor-serving facilities would be long-term, minor to moderate, and adverse.

Under Alternative 5, there would be a 2% net increase in Yosemite Valley lodging units. This would largely result from the increase in units at Curry Village and removal of units from Housekeeping Camp, such that valley lodging units would increase to 1,053. These actions would have a long-term, negligible to minor, adverse impact on concessioner operations associated with operating and maintaining these facilities.

The park would increase the total number of campsites within the valley to 640 (an increase of 37%). This would result in a long-term, minor, adverse impact on concessioner operations associated with managing and maintaining these facilities.

Concessioner employee housing within the valley would be reduced by 16%—from 1,151 beds to 972 beds. Because additional staff would be required to accommodate increased overnight visitation, removal of these units would have a detrimental effect on the supply of housing within Segment 2. The demand for utilities would increase with the addition of lodging units and campsites, and the increase in visitation. The rise in overnight visitation would be expected to offset any capacity freed up by removal of employee housing. Nonetheless, with the decrease in staffing required for concessioner operations, the demand for valley administrative facilities would be expected to decrease.

Construction activities under Alternative 5 would include the removal work described above, as well as parking improvements, new housing development at Yosemite Lodge, and new camping facilities at several locations. In addition, the park would undertake numerous actions to improve transit and pedestrian flows. The planning, demolition, design, construction, and restoration activities associated with this work would have a short-term, moderate, adverse impact on park operations. The park would also incur long-term negligible adverse operational burdens associated with the maintenance and operation of these facilities.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, minor to moderate, and adverse. Facilities removal and replacement of old guest units would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 6 and Yosemite Village.** The park would construct a traffic circle at the intersection of Northside and Yosemite Village Drives, provide walkways leading to Yosemite Village, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Increased parking and intersection performance would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced transportation management burdens.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Increased parking and improved pedestrian crossing would have a long-term, negligible, beneficial impact on park operations through reduced transportation management burdens.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, negligible to minor, beneficial impacts on park operations and facilities.

## Segments 3 and 4: Merced River Gorge and El Portal

### *Impacts of Actions to Protect and Enhance River Values*

Within Segment 4, the park would establish a 1-acre oak recruitment zone in the vicinity of Odgers fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. Development and implementation of such protective measures would have a short-term, negligible, adverse impact on normal staff operations. The consequent long-term impact on park operations associated with enforcement of these restrictions and monitoring the restoration areas would be negligible and adverse.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Visitor- and facilities-related actions that would occur within Segments 3 and 4 involve the development of housing and campsites within Segment 4. These actions, in combination with those that would occur under Alternatives 2–6, would not be expected to have an appreciable impact on park visitation.

New low- and medium-density concessioner housing would be constructed as infill development in Rancheria, outside the 100-year floodplain. In addition, as previously noted, under each alternative new housing would also be constructed in El Portal Village Center. This would increase the total number of concessioner-assigned housing units within El Portal from 192 to 288. These actions would have a beneficial impact on new and existing employees of El Portal because they would increase housing opportunities in an area of high demand.

Demand for utilities and administrative space within Segment 4 would increase under Alternative 5. The park would experience a short-term, minor to moderate, adverse operational impact associated with the planning, design, relocation, and construction of the projects described above. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the resulting increase in residential occupants.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor, adverse impacts on park operations and facilities.

## Segments 6 and 7: Wawona and Wawona Impoundment

### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to the Wawona Maintenance Yard. This work could require the use of heavy



equipment and would require approximately one week of crew time. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions, in combination with those that would occur under Alternatives 2–6, would be expected to effect a nominal decrease in overall visitation within Segment 7.

Implementation of Alternative 5 would not be expected to affect demand for employee housing within Segment 7. Demand for utilities and administrative facilities within Segment 7 would slightly decrease under Alternative 5. Fewer visitors would mean less draw upon the town's utilities. In addition, the new facilities for maintenance and firefighting staff operations proposed for Alternatives 2–6 would be expected to include high-efficiency fixtures, further reducing the demand for utilities. The construction of new facilities would also reduce demand for administrative space within this segment. The park would experience a short-term, negligible to minor, adverse operational burden associated with the planning and execution of projects proposed under Alternative 5. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.

**Wawona Campground.** Under Alternative 5, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. This would result in a long-term, negligible, beneficial impact on park operations required to manage and maintain these facilities.

**Segments 6 & 7 Impact Summary:** Actions to protect and enhance river values would result in parkwide, short-term, negligible, adverse impacts on park operations. These actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, negligible, adverse impacts on park operations and facilities.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Under Alternative 5, park staff would carry out a substantial amount of restoration throughout the Merced River corridor. These actions would considerably reduce the long-term operational burden associated with ongoing incremental resource management and maintenance activities. In addition, the park would undertake a considerable number of actions related to transportation management and commercial services. For example, the park would implement a real-time traffic and parking management program and day-use permit system, and increase Yosemite Valley parking capacity. In addition, the park would increase the number of lodging units (2%) and campsites (37%) within the valley. Nonetheless, overall valley visitation would fall under Alternative 5 by an estimated 5%, while overnight visitation would increase. Concessioner-assigned housing would also increase under Alternative 5, with a considerable shift in housing from the valley to El Portal. Under Alternative 5, demands for administrative space, utilities, and housing would be expected to increase parkwide. With

increased overnight valley visitation and the proposed shift in housing and facilities from the valley to El Portal, both would experience a considerable increase in demand for these facilities and services. Taken together, the actions proposed for Alternative 5 would have long-term, negligible to minor, beneficial impacts on park operations and facilities, mainly due to proactive habitat restoration and facilities management activities.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Cumulatively considerable projects that could affect park facilities and operations are the same as those identified in Alternative 2, and include past, present, and reasonably foreseeable actions in the Yosemite region.

#### ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

The cumulative impacts of Alternative 5 management measures, in combination with those common to Alternatives 2-6, would generally be beneficial. Past and present facilities improvements and upgrades would reduce the operational demands on park staff to maintain these assets. For the same reason, park operations would similarly benefit from past and present habitat restoration and resource management projects and plans. As previously noted, continued implementation of the East Yosemite Valley Utilities Improvement Plan/EA would further reduce demands for park utilities. Nonetheless, the burdens of managing for such high levels of visitation would continue to have a detectable impact on park operations. As a result, the cumulative impact of Alternative 5 management measures, in light of past, present, and reasonably foreseeable future projects, would be long-term, minor, and beneficial.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 6, the park would implement a phased, adaptive day-use traffic and parking management program, utilizing fee structures, transit service expansion, managed access and diversions, and eventually through use of a day-use parking permit system for the East Yosemite Valley. Development, implementation, and maintenance of the system would have a long-term, moderate, adverse impact on park operations. Management of the system would require a long-term commitment of staff time and resources. However, once the program is operational, and as park staff is better able to regulate traffic entering and traveling throughout Yosemite Valley, the operational burdens associated with the present practice of managing high volumes of traffic in the valley (i.e., public safety, traffic control, parking assistance, and restoration of impacts surrounding informal parking areas) would be reduced. The result would be a long-term, minor to moderate, adverse impact on park operations.

## **Segments 1, 5, and 8: Merced River Above Nevada Fall, and Merced River Above and Below Wawona**

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitation within Segment 1 would not be expected to change appreciably under Alternative 6; wilderness access quotas would remain as under Alternative 1 (No Action) (150) and modifications to overnight accommodations would be nominal. As such, the park's operational burden associated with visitation-related wilderness restoration would remain similar to that of Alternative 1. The long-term impact would be negligible to minor and adverse.

Under Alternative 6, the Merced Lake High Sierra Camp would remain in operation and continue to host overnight guests and through-hikers during the summer months. The camp's 60 units would remain. The operational burden associated with seasonal set-up, weekly maintenance, and habitat restoration necessary to address impacts of high visitation at and around these camps would continue as under Alternative 1. The resulting impact would be long-term, minor, and adverse.

The park would not reduce the total number of designated campsites within the Merced River corridor's wilderness. The long-term impact associated with maintenance of these new facilities, however reduced, would still be negligible and adverse.

The primary park concessioner would continue to experience a long-term, negligible, adverse impact associated with staffing the Merced Lake High Sierra Camp operations. The need for employee housing units for these staffers would also continue. As under Alternative 1, the camp would keep eight concessioner employee beds. As such, implementation of Alternative 6 would not be expected to affect concessioner employee housing demand within the corridor's wilderness segments.

**Segment 1 Impact Summary:** Actions to manage user capacities, land use, and facilities would have parkwide, long-term, negligible to minor, adverse impacts on park operations and facilities.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Projects proposed in Segment 2 to protect and enhance river values involve removing buildings from the Yosemite Lodge area, and rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. These projects would take several weeks to a few months to complete, during which time normal park management activities could be disrupted. The resulting impact to park operations would be short-term, negligible to minor, and adverse. The project would also benefit parkwide operations because it would lessen the need for future meadow restoration. However, these actions would also increase the need for ongoing monitoring and maintenance of the restoration areas. As such, the proposed actions would have a long-term, negligible to minor, adverse impact on park operations.

Under this alternative, Sugar Pine Bridge would be retained, engineered log jams and large wood installed at its base, and its condition monitored. Should long-term monitoring reveal mitigation

measures are not sufficient, the park may undertake more aggressive management action, including removal of the bridge. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require up to 15 weeks of crew and equipment time over a period of two years, during which other restoration and maintenance activities could be disrupted. The resulting impact on park operations would be short-term, parkwide, minor to moderate, and adverse.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 6 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; reconfiguring the Curry Orchard Parking lot; removing campsites and infrastructure from the 100-year floodplain and restoring 6.5 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails and selectively removing conifers at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 28 weeks of crew and equipment time over a period of at least two years. As a result, these projects are likely to disrupt other ongoing maintenance and restoration projects in the valley and beyond. The resulting impact on park operations would be short-term, parkwide, moderate, and adverse.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values within Segment 2 under Alternative 6 include: relocating unimproved Camp 6 parking and placing large wood and engineered logjams along the bases of riverbanks upstream from Sugar Pine, Ahwahnee, and Stoneman Bridges. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 16 weeks of crew and equipment time over a period of two years, during which other restoration and maintenance activities could be disrupted. The resulting impact on park operations would be short-term, parkwide, minor to moderate, and adverse.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities under Alternative 6, specifically those concerning vehicle access and overnight accommodations, would result in a 4% increase in daily Yosemite Valley visitation, from approximately 20,900 under Alternative 1 to 21,800. Daytime visitation would decrease by nearly 1,100 (7%). However, due largely to increases in lodging and campground facilities, overnight visitation would increase by about 2,000 (33%). The resulting impact on staffing and other resources required to restore areas affected by high visitor use, manage traffic, and maintain visitor serving facilities would be long-term, minor to moderate, and adverse.

Under Alternative 6, there would be a 21% net increase in Yosemite Valley lodging units. This would largely result from the substantial increase in units at Yosemite Lodge and Curry Village, along with a slight reduction in Housekeeping Camp units, such that valley lodging units would increase to 1,248. These actions would have a long-term, minor to moderate, adverse impact on concessioner operations associated with operating and maintaining these facilities.

The park would increase the total number of campsites within the valley to 739 (an increase of 59%). This would result in a long-term, moderate, adverse operational burden to park staff associated with maintenance and operation of these facilities.

Concessioner employee housing within Yosemite Valley would be reduced by 16% — from 1,151 beds to 972 beds. The demand for utilities would increase with the lodging units and campgrounds, and associated increase in overnight visitation. Despite relocation of the Concessioner General Office, the increased staffing necessary to accommodate such an increase in visitation may necessitate additional administrative facilities within the valley. As such, the demand for administrative space within the valley under Alternative 6 would be expected to increase.

Construction activities under Alternative 6 would include the removal activities described above, as well as parking improvements at Curry Village and in the vicinity of Yosemite Lodge;; new housing development at Yosemite Lodge; and new camping facilities at several locations. In addition, the park would undertake numerous actions to improve transit and pedestrian flows. The planning, demolition, design, construction, and restoration activities associated with this work would impose a short-term, moderate, adverse impact on park operations. The park would also incur long-term, minor, adverse operational burdens associated with the maintenance and operation of these facilities.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from Lower Pines (5), North Pines (14), and Upper Pines (2). In addition, the park would discontinue commercial day rides from the Curry Village Stables. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Facilities removal and replacement of old guest units would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced maintenance and management burdens.

**Camp 6 and Yosemite Village.** The park would construct a pedestrian underpass and two roundabouts, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive to improve traffic flow and alleviate congestion. The Concessioner Maintenance and Warehouse building would be remodeled to accommodate Concessioner General Office functions. The planning, design, contracting, monitoring, restoration, and maintenance associated with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Increased parking and improved traffic conditions would have a parkwide, long-term, negligible, beneficial impact on park operations through reduced transportation management burdens.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge, including the area from which cabins were removed after being damaged by the 1997 flood, to provide an additional parking for 300 automobiles and 15 tour busses. The planning, design, contracting, monitoring, restoration, and maintenance associated

with these activities would require the involvement of staff across several park divisions. The resulting impact on park operations would be parkwide, short-term, moderate, and adverse. Increased parking and improved traffic conditions would have a long-term, negligible, beneficial impact on park operations through reduced transportation management burdens.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result parkwide, long-term, negligible to minor, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, negligible to minor, adverse impacts on park operations and facilities.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Within Segment 4, the park would establish a 1-acre oak recruitment zone in the vicinity of Odgers fuel storage area and adjacent parking lots. Parking would be prohibited within the trees' drip lines, and new building construction would be prohibited within the oak recruitment zone. Development and implementation of such protective measures, including the removal of nonnative fill, decompaction of soils, and replanting the oak tree understories in the vicinity of these zones, would have a short-term, negligible, adverse impact on normal staff operations. The consequent long-term impact on park operations associated with enforcement of these restrictions and monitoring the restoration areas would be negligible and adverse.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Visitor- and facilities-related actions that would occur within Segments 3 and 4 involve the development of housing and campsites within Segment 4. These actions, in combination with those that would occur under Alternatives 2–6, would not be expected to have an appreciable impact on park visitation.

New high-density concessioner housing would be constructed in Rancheria and Abbieville, outside the 100-year floodplain. In addition, as previously noted, under each alternative new housing would also be constructed in El Portal Village Center. This would increase the total number of concessioner-assigned housing units within El Portal from 192 to 506. These actions would have a beneficial impact on new and existing employees of El Portal because they would increase housing opportunities in an area of high demand.

Demand for utilities and administrative space within Segment 4 would increase under Alternative 6. The park would experience a short-term, moderate, adverse operational impact associated with the planning, design, relocation, and construction of the projects described above. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the resulting increase in residential occupants.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result parkwide, long-term, negligible, adverse impacts on park operations. Actions to manage user capacities, land use, and facilities would have parkwide, long-term, minor, adverse impacts on park operations and facilities.

## **Segments 6 and 7: Wawona and Wawona Impoundment**

### *Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 6 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew time. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Visitor- and facilities-related actions that would occur within Segments 6 and 7 involve the removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements within Segment 7. These actions, in combination with those that would occur under Alternatives 2–6, would be expected to effect a nominal decrease in overall visitation within Segment 7.

Implementation of Alternative 6 would not be expected to affect demand for employee housing within Segment 7. Demand for utilities and administrative facilities within Segment 7 would slightly decrease under Alternative 6. Fewer visitors would mean less draw upon the town's utilities. In addition, the new facilities for maintenance and firefighting staff operations proposed for Alternatives 2–6 would be expected to include high-efficiency fixtures, further reducing the demand for utilities. The construction of new facilities would also reduce demand for administrative space within this segment. The park would experience a short-term, negligible to minor, adverse operational burden associated with the planning and execution of projects proposed under Alternative 6. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.

**Wawona Campground.** Under Alternative 6, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. This would result in a long-term, negligible, beneficial impact on park operations required to manage and maintain these facilities.

**Segments 6 & 7 Impact Summary:** Actions to protect and enhance river values would result in parkwide, short-term, negligible, adverse impacts on park operations. These actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would also have parkwide, long-term, negligible, adverse impacts on park operations and facilities.

**Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Under Alternative 6, park staff would carry out a substantial amount of restoration throughout the Merced River corridor. These actions would considerably reduce the long-term operational burden associated with ongoing incremental resource management and maintenance activities. In addition, the park would undertake a considerable number of actions related to transportation management and commercial services. The park also would increase the number of lodging units (21%) and campsites (59%) within Yosemite Valley. These actions would cause overall valley visitation to rise by an estimated 4%, due entirely to a substantial increase in overnight visitation (daytime visitation would continue to fall under Alternative 6). Concessioner-assigned housing would also increase under Alternative 6, with a substantial shift in housing from the valley to El Portal. Demands for administrative space, utilities, and housing would be expected to increase parkwide. However, with increased valley visitation and the proposed shift in housing and facilities from the valley to El Portal, both would experience a substantial increase in demand for these facilities and services. The long-term impacts on park operations and facilities would be negligible to minor, and adverse.

**Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Cumulatively considerable projects that could affect park facilities and operations are the same as those identified in Alternative 2, and include past, present, and reasonably foreseeable actions in the Yosemite region.

***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

The cumulative impacts of Alternative 6 management measures, in combination with those common to Alternatives 2-6, would generally be beneficial. Past and present facilities improvements and upgrades would reduce the operational demands on park staff to maintain these assets. For the same reason, park operations would similarly benefit from past and present habitat restoration and resource management projects and plans. As previously noted, continued implementation of the *East Yosemite Valley Utilities Improvement Plan/EA* would further reduce demands for park utilities. Nonetheless, the burdens of managing for such high levels of visitation would continue to have a detectable impact on park operations. As a result, the cumulative impact of Alternative 6 management measures, in light of past, present, and reasonably foreseeable future projects, would be long-term, negligible and beneficial.



## **Transportation**

### ***Affected Environment***

#### **Regulatory Framework**

##### ***Management Policies 2006***

The National Park Service (NPS) *Management Policies 2006*, the basic service-wide policy document of the NPS, establishes provisions for management of a wide range of activities within the park.

Transportation-related topics addressed include the management of roads, traffic, parking, trails, bicycle paths, and many others. For example:

- Park roads will be well-constructed, sensitive to natural and cultural resources, reflect the highest principles of park design, and enhance the visitor experience. Before roads are chronically at or near capacity, the use of alternative destination points or transportation systems or limitation on use will be considered as alternatives to road expansion.
- All trails and walks will be carefully situated, designed, and managed to
  - reduce conflicts with automobiles and incompatible uses;
  - allow for a satisfying park experience;
  - allow accessibility by the greatest number of people; and
  - protect park resources.
- Parking areas and overlooks will be located to not unacceptably intrude, by sight, sound, or other impact, on park resources or values. When parking areas are deemed necessary, they will be designed to harmoniously accommodate motor vehicles and other appropriate users. Permanent parking areas will not normally be sized for the peak use day, but rather for the use anticipated on the average weekend day during the peak season of use.

##### ***Yosemite General Management Plan***

The 1980 *General Management Plan* for Yosemite National Park establishes general management planning and policy direction for the park. The document sets forth specific management goals, including markedly reducing traffic congestion, among others. In keeping with this vision, the plan sets forth specific measures intended to reduce and ultimately eliminate private automobile use within Yosemite Valley, including the removal of excess day parking spaces, improvement of the shuttle system, creation of opportunities for bicycling throughout the Valley, and enforcement of the park's automobile capacity limitations.

##### ***The Superintendent's Compendium***

The *Superintendent's Compendium* sets forth park policy on a wide range of specific activities within the park, including road closures; parking restrictions; vehicle load, weight, and size limits; speed limits; and bicycling, among many other provisions under the discretionary authority of the

Superintendent. With regard to traffic management, the *Superintendent's Compendium* helps guide park staff decision-making when traffic conditions reach certain threshold conditions. For example, the document states, "Visitors may enter Yosemite Valley until westbound traffic is backed-up from Lower Yosemite Falls to Curry Village Four-Way intersection or all day use parking spaces have been filled, and/or the 18,241-person capacity has been reached" (NPS 2011a). Other traffic management items in the *Superintendent's Compendium* include the following:

- All buses visiting Yosemite Valley, not including vans, are required to unload and pick up their passengers, and park only in areas designated by their commercial bus authorization.
- Establish vehicle load, weight, and size limits, which are more restrictive than state law, for park roads.
- Establish a 35 miles per hour (mph) maximum speed limit on park roads unless posted otherwise; specific lower maximum speed limits are established for roads under chain controls (25 mph) and for approaching or leaving all entrance station areas (20 mph).

The *Superintendent's Compendium* also sets forth park policy and regulations on commercial transportation within the park.

## Roadway System and Traffic Volumes

### Regional Roadway System

California state highways leading into Yosemite National Park (Highways 41, 120, and 140) transition into an internal parkwide road system at the entrance stations. Although the State of California has a road right-of-way for Highway 140 through the El Portal Administrative Site, it has no rights-of-way through the park, so there are no state highways within the park boundaries; however, state highway numbers are used on park signs to help orient visitors. Additional transportation facilities within the park consist of a series of spur roads, access drives, pedestrian trails, bicycle paths, and parking areas leading from the main roads. The park has roughly 200 miles of roads, of which about 30 miles traverse the Yosemite Valley floor. Main points of park entry are shown in **figure 9-40** and include: Arch Rock Entrance (El Portal Road/Highway 140), Big Oak Flat Entrance (Big Oak Flat Road/Highway 120), Hetch Hetchy Entrance (Hetch Hetchy Road), South Entrance (Wawona/Highway 41), and Tioga Pass Entrance (Tioga Road/Highway 120).



**Figure 9-40**  
Park Roadways

Yosemite's road network, outside of Yosemite Valley, is generally characterized by one travel lane in each direction. Destinations throughout the Valley are accessed through a loop, comprised primarily of Southside Drive (inbound) and Northside Drive (outbound). The loop is connected by four crossings of the Merced River, as described below. On average, park road speed limits are around 35 mph, lane widths are approximately 11 to 12 feet, and shoulder widths are roughly 0.5 feet to 2 feet. Major park roadways within the study corridors are described below (by segment), with traffic volume data recorded at fixed counter locations within the park during peak season periods.

### *Traffic Volumes*

Traffic volumes within the park tend to be highest during the months of peak visitation, which are generally between May and September (Memorial Day to Labor Day), with July and August typically being the busiest months. **Table 9-154** provides an overview of peak season traffic volumes in 2011 at the park's entrance stations.

**TABLE 9-154: MONTHLY INBOUND VEHICLE TRAFFIC VOLUMES (IN 2011) AT PARK ENTRANCE STATIONS**

Entrance Station	May		June		July		August		September	
	Total	%	Total	%	Total	%	Total	%	Total	%
Arch Rock	44,950	32	56,213	29	59,327	22	54,471	21	44,896	23
Big Oak Flat	40,870	30	60,856	32	75,667	29	66,429	25	50,263	26
Hetch Hetchy	5,312	4	6,475	3	5,360	2	3,892	1	3,194	2
South	47,396	34	54,693	29	76,212	29	69,499	27	49,486	25
Tioga Pass	0	0	13,200	7	48,050	18	66,650	26	48,000	24
<b>Total</b>	<b>138,528</b>	<b>100</b>	<b>191,437</b>	<b>100</b>	<b>264,616</b>	<b>100</b>	<b>260,941</b>	<b>100</b>	<b>195,839</b>	<b>100</b>
SOURCE: NPS 2011m										

Park traffic is comprised mainly of park visitors, and park employees (many of whom live along the Highway 140 corridor). As is evident from Table 9-154, vehicle entries are generally evenly spread among the entrance stations except for the Hetch Hetchy Entrance, which is the only entrance not directly accessible from a state highway and not connected to the park's broader road network. In 2011, traffic was heaviest in July, with the largest number of vehicles entering through the South Entrance. The Tioga Pass is closed seasonally due to snow, generally from November to May. This explains the absence of Tioga Pass traffic data for May, as well as that month's comparatively low traffic volume.

The vast majority of park visitors arrive by private automobile. A summer of 2007 park visitor survey (White and Aquino 2008) found that 84.4% of respondents arrived by private automobile. Other modes included commercial tour bus (4.8%), recreational vehicle (3.2%), and regional bus transit (1.3%). Among those who entered the park by private vehicle, nearly 87% traveled through the park in their private vehicle at least part of the time. However, more than 60% of these visitors also traveled via the Yosemite Valley Shuttle. Despite the attractiveness of the public transportation system, the prominence of private vehicle use among visitors creates complex traffic management challenges for park staff, especially on busy summer days.

Traffic volumes fluctuate seasonally, daily, and hourly within the park. As noted previously, traffic tends to be heaviest during the summer, between May and September. However, visitation patterns also vary based on day of the week and time of day, with traffic volumes in the park higher during weekends than on weekdays. Similarly, visitor travel to and from the park results in daily traffic peaks beginning in the late morning and lasting through early evening. While these fluctuations are seen throughout the park, their implications for Merced River management tend to be most pronounced within the Yosemite Valley area (Segment 2). Planning for management activities and facilities where peak conditions are significantly different from average typically applies the concept of design conditions, which address typically busy days during the peak season, but not the day with the highest visitation.

The park typically experiences the highest traffic volumes on weekends during the summer, with peak volumes occurring during holiday weekends. During the peak season of 2011 (Memorial Day weekend through Labor Day weekend), an average of 5,749 vehicles entered Yosemite Valley on Southside Drive daily. On the busiest day (June 18), 7,345 vehicles entered the Valley; this represents an increase of 28% when compared to an average day.

Daily traffic volumes recorded at fixed counter locations within the Yosemite Valley indicate a long-term historical trend of growth in traffic. Traffic volumes leveled off and even fell slightly between 2001 and 2006. However, they have once again begun to rise and have approached historic highs (NPS 2011n). Daily traffic volumes during most of the year do not exceed the capacity of any of the major roadways. Similarly, on busy summer days, travelers on most park roads during peak travel hours encounter only minor to moderate congestion. However, at key activity areas (popular attractions, parking areas, and major intersections) within Yosemite Valley, and at the park entrance stations, moderate to major congestion occurs (RSG 2011). Disruptions to traffic flow are often attributed to excessive circulation on roadways by visitors and tour bus drivers seeking parking spaces.

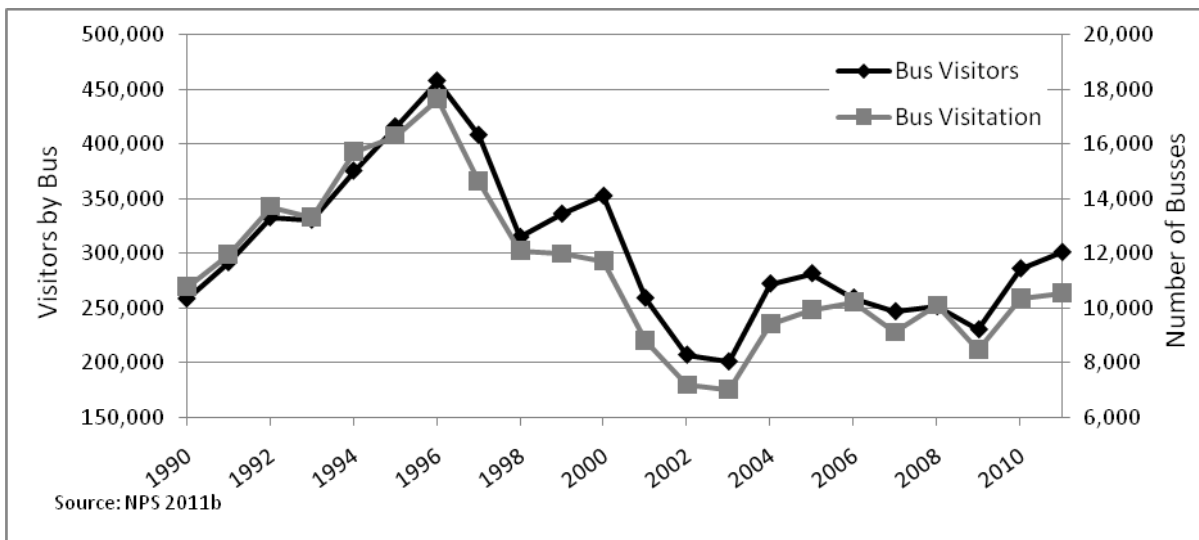
To assist people in planning their trip to Yosemite, the park has a new tool (as of July 2012) to inform travelers of traffic congestion (heavy, moderate or light) in different areas of the park (Yosemite Valley, Tuolumne Meadows, Wawona and Mariposa Grove, and Glacier point). A weekly Traffic Forecast is available at the Yosemite web site's Plan Your Visit page. Travelers can also sign up to receive the forecasts via email.

### **Transit and Tour Bus Services**

Multiple transit services operate within Yosemite, including the Yosemite Area Regional Transit System (YARTS), external tour bus operators, and concessioner-operated in-park shuttle and tour bus services. With the exception of shuttle bus services in Tuolumne Meadows and to the Mariposa Grove from Wawona, nearly all buses travel to and from or within Yosemite Valley. As discussed in the following sections, while bus visitation represents a relatively small proportion of total annual visitation, a large number of visitors to the park rely on transit between destinations within the park. Bus visitation trends are briefly discussed in the following paragraphs, followed by a description of transit services within the park.

### Bus Visitation Overview

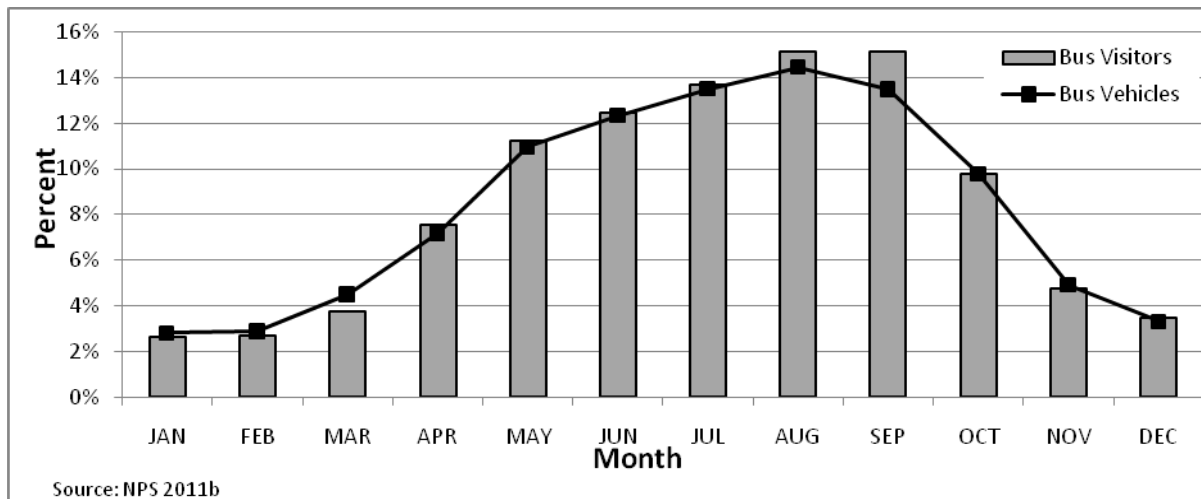
The NPS tracks the number of buses entering the park, as well as the number of visitors that arrive by bus. **Figure 9-41** shows the number of visitors arriving by bus along with the number of buses entering the park for the period between 1990 and 2011 (NPS 2011m). As shown in figure 9-41, the number of visitors traveling to the park by bus steadily increased from 1990 (258,412 visitors and 10,784 buses) to 1996 (457,896 visitors and 17,656 buses). Between 1996 through 2003, both the number of visitors arriving by bus and the number of buses dropped by more than 50%. In 2003, 200,818 visitors arrived on 7,021 buses. In the years since, both the number of buses and bus ridership has fluctuated, but generally increased. In 2011, 300,979 visitors arrived by 10,565 buses. With some variation, the pattern of visitors arriving by bus over this period generally follows the pattern for overall park visitation for this same period. In 1996, 14% of visitors to the park arrived by bus. By 2003, that number had declined to 6%. In 2011, visitors arriving by bus comprised slightly more than 7% of total visitation.



**Figure 9-41**  
Bus Visitation to Yosemite National Park and  
Number of Buses, 1990–2011

**Figure 9-42** shows the percentage of annual buses as well bus visitation by month averaged over the 2000 to 2011 period. As shown in the figure, about 15% of the people who visit Yosemite by buses during an average year arrive during the peak months of August and September, respectively, with May, June, and July each accounting for 11% to 13% of annual visits by bus. Visitation by bus is lowest in the off-peak months of November through February, when combined ridership for these months constitutes just 13% of total annual ridership. The monthly patterns of visitation to Yosemite by bus have remained relatively constant over the last decade (NPS 2011m).

Buses providing day tours with no overnight stay arrive at the park in mid- to late morning and depart the park in mid-to late afternoon, with duration of park visit ranging from four to six hours. Buses that bring visitors to the park for overnight stays generally follow the same routine as for day trips, the exception being that when buses arrive at Yosemite Lodge, visitors depart and check into the lodge for



**Figure 9-42**  
Percent of Annual Buses and Bus Visitors by Month  
(Ten-Year Average)

their overnight stay. The bus then departs with tour guests who were brought to the park one day to three days earlier and have checked out of Yosemite Lodge for a return trip back to their point of origin or to another out-of-park destination.

## Regional Bus Transit

### *Yosemite Area Regional Transportation System*

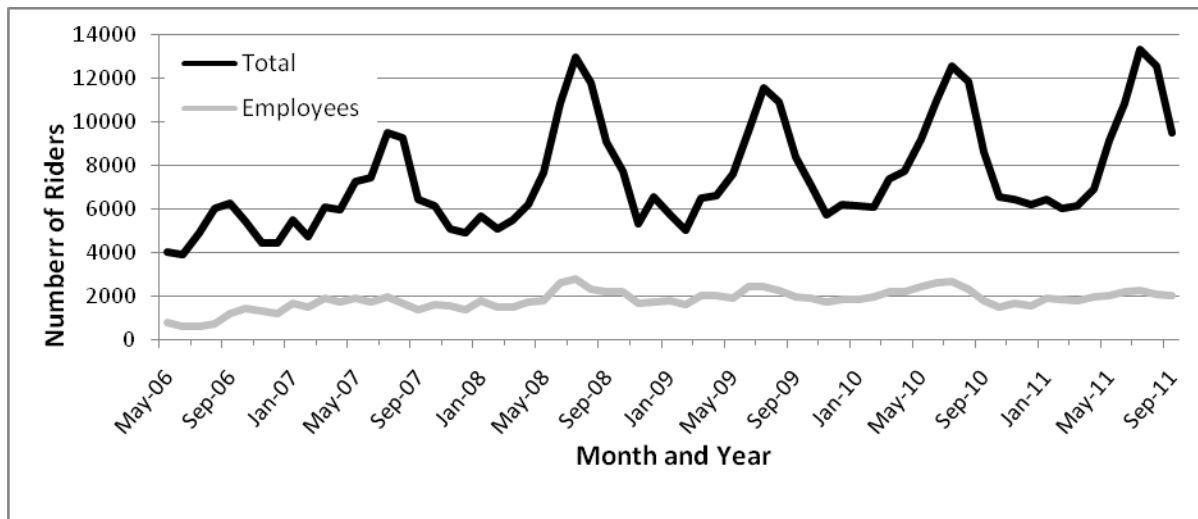
The YARTS was formed in 1999 by a Joint Powers Authority made up of the member counties of Mariposa, Merced, and Mono. YARTS provides regional bus service with four daily runs from Merced to Yosemite Valley, four daily runs from Mariposa to the Valley, and one daily run from Sonora to the Valley. Less service is provided on weekends, and more service is provided in summer, including a daily round-trip from Mammoth and points in Mono County through the Tuolumne Meadows area and connection to Valley buses. Through its connection with Amtrak, YARTS provides public transit services from San Francisco Bay Area airports, including the San Francisco, San Jose and Oakland international airports, and from the Fresno International Airport.

YARTS service began operations in 2000 in order to provide an alternative mode of transportation to and from Yosemite. The service is designed to serve the following traveling patterns:

- visitors staying in the neighboring gateway communities and visiting Yosemite
- employees along the Highway 140 corridor who work in El Portal or Yosemite
- students and employees who travel to Merced for school and/or work
- visitors who travel from Mono County to Yosemite for recreation during the summer only

- In summer 2012, YARTS added daily round trip visitor transportation services between Sonora/Jamestown, Groveland, Buck Meadows and other destinations along Highway 120 west to Yosemite Valley.

Figure 9-43 presents YARTS ridership data for employees, visitors, and others along the Highway 140 corridor from May 2006 through September 2011 (NPS 2011o). During this timeframe, the trend in overall ridership has been consistent, although distinct seasonal patterns have developed.



NOTE: Chart does not reflect Amtrak ridership.  
SOURCE: NPS 2011o.

**Figure 9-43**  
YARTS Ridership along Highway 140  
May 2006 through September 2011

As is evident from the table, employee ridership remains fairly consistent throughout the year, while total ridership fluctuates dramatically based on season. Total ridership tends to be highest during peak summer months (e.g., May through September). Average peak month ridership between 2006 and 2011 ranged from 5,682 (May) to 8,696 (June). Conversely, ridership is lowest during the off-peak months (e.g., November through February). Average off-peak month ridership between 2006 and 2011 ranged from 3,689 (February) to 4,119 (December) (NPS 2011o).

YARTS ridership to the park along the Highway 140 corridor represents a very small percentage of total park visitation. However, the summer 2007 visitor survey found that the YARTS bus service is very important to its riders (White and Aquino 2008). For the years 2006 through 2011, total annual YARTS ridership ranged from a low of 49,924 in 2006 to a high of 77,281 in 2011, representing between 1.5% and 1.9% of total park visitation for the respective years. Visitor ridership closely follows the seasonal visitation numbers for the park, with the four summer months of May through September representing approximately 50% of total visitor ridership for the years 2006 through 2011 (NPS 2011o). It is assumed this trend would continue in the future.

## Parking Areas

Parking supply within the park consists of designated day use and overnight visitor, employee, and resident lots, located throughout the primary developed areas of Yosemite Valley, El Portal Administrative Site, and Wawona. Other designated parking areas include trailhead parking lots and paved turn-outs along park roads. In addition, during peak summer days, motorists rely on an increasing number of informal areas for parking, such as unpaved roadside shoulders. Despite the potential resource impacts associated with use of these informal parking areas, the park depends upon these areas to satisfy parking demand during peak periods. Parking shortages are a substantial contributor to vehicle congestion within some areas of the river corridor, in particular the Yosemite Valley portion of the corridor. Congestion and crowding can degrade the overall visitor experience. The 2005 visitor survey found that parking areas were the most frequently mentioned locations where visitors felt crowded (Littlejohn et al. 2005). The park uses traffic management personnel to actively manage traffic and parking conditions. The number of parking spaces varies depending upon the way visitors configure their vehicles and the types of vehicles in an area. For example, RVs typically take more space than a sedan, and directing RVs to different areas increases the number of spaces available for sedans.

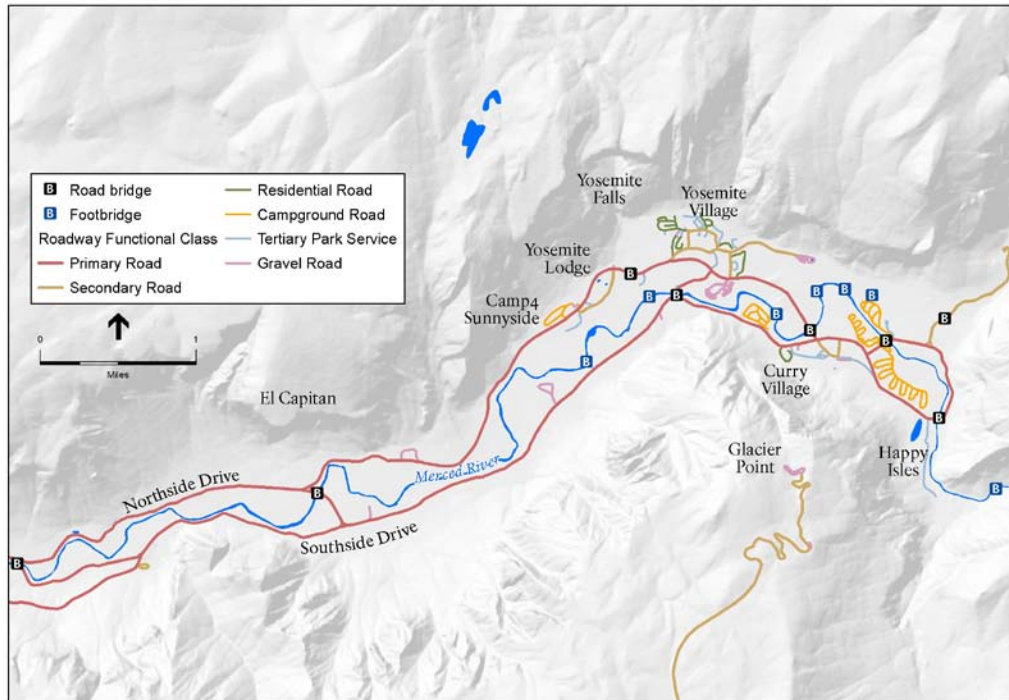
## Segment 2: Yosemite Valley

### *Roadway System*

The Valley Loop Road, shown in **figure 9-44**, is an approximately 12-mile-long combination one-way/two-way loop road that provides primary circulation within Yosemite Valley. It also connects the other major roads, facilitating through-park travel, and is maintained for year-round use. The pavement width is about 21 feet, and there are two travel lanes. Four bridges across the Merced River connect the roadway that runs parallel to the south Valley wall (Southside Drive) with the roadway on the north (Northside Drive). One-way operation is maintained along Southside Drive from Pohono Bridge in the West Valley to Stoneman Bridge near Curry Village in the East Valley. Two segments of one-way travel are maintained on Northside Drive. The first one-way section extends from Stoneman Bridge to Yosemite Village. The second one-way section extends from 100 yards west of Camp 4 to the Pohono Bridge. Two-way traffic is allowed between Camp 4 and Yosemite Village on Northside Drive.

In addition to Pohono and Stoneman bridges, connections between Northside Drive and Southside Drive are provided at El Capitan Bridge and at Sentinel Bridge near the Yosemite Chapel. Average daily traffic volumes in July 2011 were about 6,196 vehicles on Southside Drive and 6,240 vehicles on Northside Drive (NPS 2011n). The discrepancy between inbound and outbound traffic is likely because not every vehicle that enters the Valley leaves the Valley on the same day. Average daily volumes on peak weekends and peak holiday weekends have exceeded the July 2011 daily average in the past. In addition, monthly daily average traffic volumes may vary from those stated above.





**Figure 9-44**  
Yosemite Valley Loop Road

### *Traffic Volumes*

Traffic volumes inbound to Yosemite Valley increase through the early portion of the day, reaching a peak from 10:00 a.m. to about noon. Average inbound traffic volumes on Southside Drive during this period in July 2011 were about 641 vehicles per hour. On the busiest day in 2011, the inbound hourly volume of traffic reached about 648 to 821 vehicles per hour. On these days, the peak travel period generally extends from 10:00 a.m. to about 2:00 p.m. Peak traffic occurs when available parking has reached saturation, resulting in continuous stop-and-go traffic for those two to four hours of peak demand. Inbound traffic is slowed or diverted.

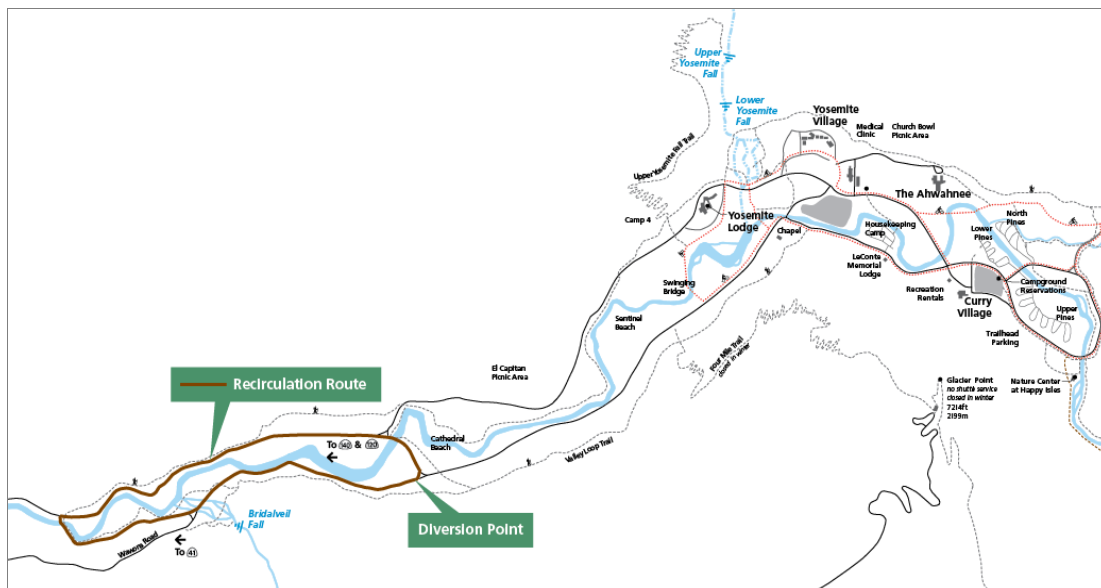
Traffic volumes leaving Yosemite Valley tend to increase towards the later part of the day, peaking between 4:00 p.m. and 6:00 p.m. Average outbound traffic volumes on Northside Drive during this period in July 2011 were about 724 vehicles per hour. Traffic volumes on the average day equal or exceed 500 vehicles per hour on Northside Drive from about 2:00 p.m. to 6:00 p.m. On the busiest day in 2011, the outbound traffic volume peaked at 750 vehicles per hour and exceeded 500 vehicles per hour from 1:00 p.m. to 8:00 p.m. (NPS 2011n).

### *Traffic Flow Conditions*

The roadway system in Yosemite Valley can be confusing to first-time visitors because of the one-way circulation, limited opportunities to cross the Merced River, and circuitous travel routes. Highly congested locations include the intersection of Northside Drive and the Camp 6 parking lot entrance, the intersection of Northside Drive and Sentinel Drive (“Bank Three Way”), and the pedestrian

crossing from Yosemite Lodge to Lower Yosemite Fall. Conflicts between vehicles and pedestrians at these key intersections are a primary factor in causing traffic delays, which are experienced primarily during the afternoon hours during the peak season. Traffic congestion in the Valley can cause frustrating delays to visitors in private vehicles, leads to increased vehicle emissions, and disrupts the operation of the Valley shuttle bus system.

The park employs a traffic management response team to assist with traffic congestion, mainly within the Valley, during peak summer days. The traffic management team helps relieve congestion by providing visitor information, directing vehicles to parking locations, and managing intersections, pedestrian and vehicle traffic. On those occasions when traffic volumes and parking in the East Valley reaches or exceeds capacity, traffic managers will redirect traffic otherwise bound for the East Valley. This diversion measure is commonly known as the “shunt” (see **figure 9-45**) and involves a series of specific management contingencies for managing excess traffic at a rate of 200 to 400 vehicles per hour.



**Figure 9-45**  
East Valley Redirection “Shunt”

### *Commercial Tour Buses*

Approximately 4.8% of visitors arrived at Yosemite by commercial tour bus during the summer of 2007 (RSG 2011). In July 2011, an average of 41 commercial tour buses entered the park each day, which is lower than the Valley historically accommodated in past peak years such as the summer of 1996; tours include day use itineraries and overnight stays. A typical one-day tour to Yosemite Valley includes short 15-minute to 30-minute stops at popular vistas such as Tunnel View and along Southside Drive at the Bridalveil Fall viewing area, then proceeding to Yosemite Lodge for a longer stop of two hours to three hours. At Yosemite Lodge, visitors have a variety of options, such as walking to Lower Yosemite Fall, visiting the Yosemite Lodge gift shop and food court, and/or getting on the Valley shuttle bus for a trip around the Valley floor. While stopped at Yosemite Lodge, buses park in

the 15 designated bus parking spaces adjacent to this facility. The number of buses simultaneously arriving and departing at these locations (i.e., platooning) has led to delays in the park in the past. Currently, there are no regulations that control or prevent platooning. Upon leaving the Valley, buses typically stop along Northside Drive at the El Capitan Meadow for 15–30 minutes to enjoy views of El Capitan and the adjacent El Capitan Meadow.

Buses that bring visitors to the park for overnight stays generally follow the same routine as described above for day trips, except that when buses arrive at Yosemite Lodge, visitors depart and check into the lodge for their overnight stay. The bus then departs with tour guests who were brought to the park one day to three days earlier and have checked out of Yosemite Lodge for a return trip back to their point of origin or to another out-of-park destination.

### ***Yosemite Valley Bus Tours***

Park tours originating within the park take visitors around the Valley floor and beyond. Concessioner-operated open-air trams (towed by a hybrid-diesel-powered truck-tractor) with a capacity of 70 passengers are used in summer to carry visitors along the Valley Loop Road and to Tunnel View on the Wawona Road above the West Valley. The trams are usually at capacity from mid-morning to late afternoon. A variety of tours beyond Yosemite Valley are also offered by the park concessioner. Most park tours originate at the lodging facilities within the Valley. In summer, daily trips from Yosemite Valley include one hikers' bus to Glacier Point and one to Tuolumne Meadows, and a grand tour that includes the Valley floor, the Mariposa Grove of Giant Sequoias, and Glacier Point.

### ***Valley Shuttle Bus System***

The current concessioner-operated shuttle bus system (with a fleet of 18 buses) operates year-round in Yosemite Valley, offering service to the major developed areas in the East Valley. The shuttles run daily from 7:00 a.m. to 10:00 p.m. every 10 to 20 minutes on the main route (an 8-mile loop with 22 stops). Service to Happy Isles and the Mirror Lake Trailhead may stop after a major snowfall. Two other Valley shuttle lines run during the summer only. The first (El Capitan Shuttle) provides service between the Valley Visitor Center and the El Capitan bridge, with stops at Camp 4, El Capitan picnic area, and the Four Mile Trailhead. The second (Express Shuttle) provides direct service between the Yosemite Village day parking area and the Valley Visitor Center. The latter two routes operate daily between 9:00 a.m. and 6:00 p.m. During the winter, when the ski area is operating, separate shuttle service is provided between the Valley and Badger Pass (typically mid-December through March). Two shuttle stops within the Valley (Camp 4 and El Capitan Meadow) lack the physical improvements of a formal bus stop.

Valley shuttle bus system ridership is highest during peak summer months (e.g., May to September). The Summer 2007 visitor survey found that weekday visitors (69%) are more likely than weekend visitors (54%) to use the shuttle bus system (White and Aquino 2008). On average, during the peak season in 2011, daily ridership exceeded 19,000. In July, average daily ridership exceeded 22,000 passengers. During the off-peak winter months of 2011 (e.g., January, February, November, and December), daily ridership averaged 2,154 passengers. Among these months, February had the lowest daily ridership of just 1,649 passengers (DNC 2011b).

High passenger volumes during peak summer months have a number of negative implications for drivers, passengers, and the broader public. A recent report on transportation conditions within the park (RSG 2011) documented park shuttle conditions during multiple summer visits in 2010 and 2011. According to the report, shuttle crowding was observed from mid-morning to late afternoon with standing room only conditions, which resulted in passengers being left behind because of insufficient shuttle capacity. In addition to crowding, challenges for shuttle bus users and drivers are also created by vehicle traffic, pedestrians, and bicyclists.

### *Parking Areas*

Yosemite Valley is the area with the highest concentration of development and the most parking spaces in Yosemite. Because of the extensive use of informal parking areas during periods of high demand and because many such areas are not paved or marked, it is difficult to identify a specific parking supply. However, an inventory of parking used by visitors in the Valley conducted in 2011 identified about 1,614 spaces for day-visitor vehicles in the East Valley, primarily at Camp 6, the Village Store parking lot, Curry Orchard, and at various destinations along the Northside and Southside Drive loop roads, and along Sentinel Drive (NPS 2011p). The 2011 parking inventory identified about 440 day parking spaces in the West Valley (between Yosemite Lodge and Pohono Bridge on Northside Drive, and between Pohono Bridge and the El Capitan crossover). Many of the spaces are informal turnouts and other areas are best suited to short-term use associated with auto touring. Parking for overnight guest vehicles is available at lodging, campground, and wilderness access areas. No designated day parking is available in the Yosemite Lodge area, but day visitors often compete with overnight guests for the available spaces. Designated day parking is permitted in the Camp 4 “overflow” lot (former Chevron Station), with parking regulated by signs noting times of permitted day use, and overnight permit-required information.

On crowded summer days, all formal parking is fully occupied, with parking spilling onto the roadway shoulders throughout the East Valley. This uncontrolled parking leads to pedestrian, bicycle, and vehicle conflicts, damage to vegetation and soils along the road edge, and the formation of informal trails. During these peak times, parking attendants direct day visitors to use the available spaces within the Camp 6 day parking lot as efficiently as possible, and they also direct vehicles to park as efficiently as possible in roadside spaces. Under this directed parking scenario, a maximum capacity of about 1,852 day-visitor vehicles can be achieved for the East Valley.

The demand for parking in the East Valley is primarily affected by day use visitation. Parking demand varies during the day and from day to day as the number of day and overnight visitors and nonresident employees fluctuates. During peak parking events, specific areas of constrained supply become evident. For example, the park has documented parking demand in excess of supply at Camp 6, Yosemite Lodge, Camp 4, Curry Orchard, The Ahwahnee, the Wilderness lot, and various employee and residential parking areas.

In the West Valley, parking lots are available at Bridalveil Fall and Tunnel View, and numerous roadside spaces exist along Southside Drive, Northside Drive, and El Capitan crossover between Pohono Bridge and the East Valley.

## **Segments 3 and 4: Merced River Gorge and El Portal**

### ***Roadway System***

El Portal Road is about 7.5 miles long within the park. At the park boundary, this road connects to Highway 140. The El Portal Road enters the park about two miles east of the El Portal Administrative Site, passes through the Arch Rock Entrance Station, and continues to the Valley Loop Road near Pohono Bridge. It is maintained for year-round access and has been historically called the All-Year Highway. The road is characterized by steep, rocky canyon walls with small river flats and terraces and has a typical pavement width that varies from 19 feet to 22 feet.

Highway 120 enters the park at the Big Oak Flat Entrance Station, and continues through the park to Tioga Pass, exiting eastbound near the summit. Big Oak Flat Road begins at Crane Flat and continues for about 11 miles to its junction with El Portal Road. Big Oak Flat Road may be used as a through route in conjunction with other major park roads and is maintained for year-round access. The topography changes from mountainous on the east end of the road to rolling terrain at the west end. The width paved roadway ranges from 26 to 30 feet.

### ***Traffic Volumes***

Average daily traffic entering the park on El Portal Road (Arch Rock Entrance Station) and on Big Oak Flat Road (Big Oak Flat Entrance Station) in July 2011 (the most recent peak period for which such data are available) was about 1,910 and 2,440 vehicles, respectively (NPS 2012F).

### ***Traffic Flow Conditions***

During busy days, when large numbers of vehicles are entering the park, long queues form at park entrances, where motorists are waiting to pay. As stated above, the park employs a traffic management team that periodically implements traffic restrictions during the busiest summer weekends when congestion in Yosemite Valley is most severe. Congestion is monitored using qualitative factors, such as observations of traffic conditions and the judgment of park supervisory personnel. Because implementation of restricted access measures is labor-intensive, diverts park staff from other operations, and can result in moving congestion impacts into other less-developed park areas, such measures are implemented only when conditions warrant it in the interest of public safety.

### ***Parking Areas***

Parking areas within the Merced River gorge (Segment 3) consists of available roadside parking along the shoulder of El Portal Road; two off-road, paved parking lots; and a paved parking lot next to the Arch Rock Entrance Station. There are 220 day vehicle parking spaces and two bus parking spaces available in Segment 3 between Pohono Bridge and the park boundary. Minimal designated parking is available for exclusive employee and administrative use in this area and does not compete with visitor parking and access.

Park, park concessioner, and park partner employees work and live in the El Portal area and contribute to the parking demand within Segment 4 along with a small number of day visitors. The visitor day

parking consists of 290 spaces (primarily at the El Portal Market and fuel station and along the roadsides). There are 610 parking spaces for administrative uses and 106 residential parking spaces. The off-street and roadside parking areas located between the Merced River and Foresta Road at the El Portal Maintenance facility were not designed or built to prevent water quality contamination from automotive fluids, surface water runoff, or sediment transport. Furthermore, parking at this location often exceeds the supply, and use of informal parking along Foresta Road is necessary.

## **Segment 7: Wawona**

### ***Roadway System***

Wawona Road is about 27 miles long within the park. At the South Entrance, this road connects to Highway 41. Wawona Road is the principal access to Wawona, Mariposa Grove, Badger Pass Ski Area, Glacier Point, and Yosemite Valley and is maintained for year-round access. Throughout its length, the 24-foot-wide road traverses mountainous terrain with steep grades and is surrounded by moderate to dense forest.

### ***Traffic Volumes***

Average daily traffic entering at the South Entrance Station in July 2011 was about 1,940 vehicles (NPS 2012F).

### ***Traffic Flow Conditions***

While the number of vehicles on park roads has increased over the years, traffic volumes generally do not exceed the capacity of the roads. Traffic conditions on Wawona Road are typically acceptable along the South Fork Merced River where Wawona Road crosses and then follows the river. On peak summer days, when the Mariposa Grove parking lots reach capacity, motorists are directed to drive north to Wawona, park in Wawona, and take the shuttle bus back to Mariposa Grove. While this helps relieve pressure on formal and informal parking areas near Mariposa Grove, it exacerbates parking congestion, poor traffic circulation, and pedestrian/motor vehicle conflicts that occur in Wawona during peak summer days (RSG 2011).

### ***Commercial Tour Buses***

Approximately 4.8% of visitors arrived by commercial tour bus during the summer of 2007 (RSG 2011). In July 2011, an average of 41 commercial tour buses entered the park each day, which is lower than the Valley historically accommodated in past peak years such as the summer of 1996; tours include day use itineraries and overnight stays. The tour buses primarily focus on Yosemite Valley (as described for Segment 2 above), but some day tours may also include a stop at the Mariposa Grove of Giant Sequoias if they enter or depart the park through Wawona. The stop at the Mariposa Grove requires a transfer from the tour bus to the Wawona Shuttle because tour buses can negotiate the sharp turns on Mariposa Grove Road.

### ***Wawona Shuttle Bus System***

In the spring through fall, a free shuttle bus service operates between Wawona and Mariposa Grove of Giant Sequoias. The Wawona shuttle is a continuous loop on a 15-minute frequency that picks up and drops off passengers at the Wawona Store, South Entrance, and at the Mariposa Grove Gift Shop. During peak summer days, when the Mariposa Grove parking lots become full, motorists are instructed to drive to Wawona and ride the shuttle back to Mariposa Grove. In 2011, daily roundtrip ridership on the Wawona shuttle averaged 1,782 passengers. July had the highest volume of passengers, with average daily roundtrip ridership exceeding 2,800 passengers. Roundtrip shuttle service between the Wawona Hotel and the Yosemite Lodge is provided once daily. The Yosemite Valley-Wawona shuttle operates from approximately Memorial Day through Labor Day. Despite these formal routes, the Wawona stop lacks the improvements of a designated bus stop. For example, the stop does not have adequate seating and provides no shelter.

### ***Parking Areas***

Parking is provided in Wawona for visitors and employees associated with facilities such as the Wawona Hotel complex, the Wawona Store and Gift Shop, the Pioneer Yosemite History Center, a campground, and two picnic areas. Parking demand varies during the day and from day to day as the number of visitors and employees fluctuates. As noted previously, on peak summer days when the Mariposa Grove parking lots reach capacity, motorists are encouraged to park in Wawona and ride the free shuttle bus back to the Mariposa Grove.

There are approximately 290 day vehicle parking and 8 bus parking spaces around the Wawona Hotel and Golf Course, the Wawona Store, and Pioneer Yosemite History Center, as well as adjacent to Forest Drive and along Chilnualna Falls Road. When visitors are catching the free shuttle bus to Mariposa Grove from Wawona, they often park along the roadside shoulders of Wawona Road and Forest Drive. This uncontrolled parking leads to pedestrian and vehicle conflicts. Parking for administrative functions are located within the land assignments for these uses and do not compete with visitor parking.

### ***Environmental Consequences Methodology***

The focus of this impact assessment was the effect of potential management actions on how well the transportation system would accommodate parking and the associated traffic flow and transportation experience within the Merced River corridor. Conditions were assessed based on potential changes in traffic volumes through the river corridor tied to amounts of visitor use as prescribed by the Merced River Plan, along with associated changes to visitor accommodations and/or parking areas under each alternative.

Changes in parking were evaluated (1) as to how well they would accommodate the demand for parking and (2) for the associated effect on levels of congestion and other factors influencing the transportation experience on the roadway system serving the Merced River corridor. The analysis focuses on Yosemite Valley (Segment 2), Merced River Gorge (Segment 3), El Portal (Segment 4), and Wawona (Segment 7) because there are no actions proposed for Segments 1, 5, 6, and 8 (wilderness segments accessible only by trails, not roads) that would affect transportation conditions.

Day use capacity was determined and expressed as the number of people who would be accommodated in the river corridor at one time. Overnight capacity is expressed as the number of total persons allowed to stay overnight. Because each alternative prescribes these visitor use levels along with the associated parking spaces to accommodate the use levels, this analysis assumes that no more parking would occur beyond that which is prescribed for each alternative. Physical barriers to roadside parking would be a component of each of Alternatives 2–6. Several mechanisms for enforcing parking restrictions, including parking management staffing and a parking permit system, are being explored under the various alternatives. Additionally, it is assumed that day and overnight parking areas would be designated and that the parking management system would ensure that day use visitors did not park in overnight spaces and vice versa. This would ensure that neither day nor overnight visitors would be displaced by one another, and that the day capacities, which would be managed through the availability of day parking, were not exceeded.

Each alternative is evaluated in terms of the context, intensity, and duration of the transportation impacts, and whether the impacts are considered beneficial or adverse to the overall transportation system, parking, traffic flow, and transportation experience.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the river, such as an intersection or parking lot. This analysis further identifies if there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area within Yosemite. Regional impacts would be those that extend to the Yosemite gateway region.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Intensity was calculated based on the number of visitors affected by the proposed actions. Negligible impacts would be effects considered not detectable and be those that could have an effect on less than 5% of visitors during the peak season of visitation. Minor impacts would be effects that would be slightly detectable and be those that could have an effect on 5% to 10% of visitors during the peak season of visitation. Moderate impacts would be clearly detectable and those that could have an effect on 10% to 20% of visitors during the peak season of visitation. Major impacts would have a substantial, highly noticeable influence on the transportation system and experience and be those that could have an effect on more than 20% of visitors during the peak season of visitation.
- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of activities. A long-term impact would have a permanent effect on the performance of the transportation system, parking, traffic flow, and transportation experience.
- **Type of Impact.** Impacts were evaluated in terms of whether they would be beneficial or adverse to the overall transportation system, parking, traffic flow, and transportation experience. Research completed in Yosemite shows that visitors have their most significant park experiences when they are out of their vehicles (White et al. 2006). Currently, regarding existing transportation conditions, the majority of Yosemite visitors experience high levels of freedom and access and feel they can go “where they want, when they want” (unpublished



author communication related to White 2010). Beneficial impacts would occur when potential actions would accommodate visitor parking needs and improve traffic flow (i.e., decrease congestion), thereby at least maintaining the existing high levels of acceptability of the transportation experience. Adverse impacts would occur when potential actions would not accommodate parking demand, would increase congestion, or would alter the transportation experience (by prolonging time spent traveling in the park in a vehicle).

### ***Environmental Consequences of Alternative 1 (No Action)***

#### **All River Segments<sup>1</sup>**

The NPS would continue to undertake transportation-related maintenance improvements and resource protection measures such as repaving; adding signage; and delineating trail, parking, and roadways. The overall management direction under Alternative 1 (No Action) for the river corridor would be based on the guiding management documents in place as of 2010, as modified by the settlement agreement.

Under Alternative 1 (No Action) there would continue to be an average of 3% annual growth in visitation following recent trends. It is expected that more days during the peak season would receive the visitation currently experienced on the busiest days. Visitation could increase in the off-peak seasons, resulting in this overall annual increase. If this were to occur, then traffic congestion during nonpeak periods (e.g., during months on either side of peak summer months, and on weekdays during peak summer months) could approximate current congestion during peak periods. Increases in visitation during peak periods also could occur, and to the degree that such increases happen, congestion would marginally worsen.

#### **Segment 2: Yosemite Valley**

**Roadway System.** There would be no changes to the roadway system in Segment 2 under Alternative 1 (No Action); therefore, no impacts would occur.

**Traffic Volumes.** It is expected that current trends would continue under Alternative 1 (No Action), and the number of days per year with 6,000 or more vehicles passing Chapel Straight would increase over time. The maximum vehicle volume in the East Valley, however, is expected to remain at about 7,000 vehicles. As a result, Segment 2 would continue to experience segmentwide, long-term, minor, adverse impacts.

**Traffic Flow Conditions.** Segmentwide, long-term, moderate to major, adverse impacts associated with traffic congestion and delays would continue to occur at busy intersections in Yosemite Valley, and likely worsen as visitation levels increase by an average of 3% per year under Alternative 1 (No Action). Parking shortages and poorly performing intersections are a substantial contributor of vehicle congestion within Yosemite Valley. Alternative 1 (No Action) would continue current transportation management practices to address increases in park visitation, increases in traffic

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<sup>1</sup> There are no transportation facilities in Segments 1, 5, 6, or 8 of the Merced River corridor; therefore, this analysis focuses on the Segments 2, 3, 4, and 7, and those segments are grouped as appropriate.

volumes on the park roadways, intersection performance, and parking demand that exceeds supply. However, in the absence of enhanced transportation management actions, increases in park visitation (and associated increases in traffic volumes and parking demand) would continue to adversely affect the quality of the transportation experience by prolonging time spent traveling in the park in a vehicle. Consistent with current management practices, temporary access restrictions may be implemented at times in the Valley when westbound traffic is backed up from Lower Yosemite Fall to the Curry Village four-way intersection, or when all day use parking spaces have been filled (*Superintendent's Compendium*).

**Charter Buses.** There would be no changes to the management of charter bus access to the park under Alternative 1 (No Action). The demand for charter bus parking currently is not met by the supply. There could be segmentwide, long-term, minor, adverse impacts associated with parking demand continuing to exceed the supply.

**Yosemite Valley Bus Tours.** Under Alternative 1 (No Action), there would be segmentwide, long-term, negligible impacts on Yosemite Valley bus tours. These services would continue to operate as they do currently.

**Valley Shuttle Bus System.** No new shuttle stops would be added under Alternative 1 (No Action). There could be segmentwide, long-term, minor to moderate, adverse impacts associated with continuing crowding on Valley shuttle buses and service delays for those buses as they are slowed by traffic congestion on the Valley Loop Road.

**Parking Areas.** The existing 5,049-space parking capacity for private automobiles and commercial tour buses would remain unchanged, dispersed at sites and turnouts. Camp 6 and the Curry Orchard would continue to serve as the primary day use parking lots in Segment 2 under Alternative 1 (No Action). There could be segmentwide, long-term, minor to moderate, adverse impacts associated with parking demand continuing to exceed supply, likely worsening as visitation levels increase by an average of 3% per year.

**Segment 2 Impact Summary:** There could be segmentwide, long-term, minor to moderate, adverse impacts on transportation conditions in Segment 2 under Alternative 1 (No Action) from the continuation of current transportation management actions to address increases in park visitation, increases in traffic volumes on the park roadways, and increased parking demand that exceeds the parking supply (i.e., a larger parking deficit).

### **Segments 3 and 4: Merced River Gorge and El Portal**

Alternative 1 (No Action) would retain the existing transportation conditions in Segments 3 and 4. Camping, lodging, parking, and circulation facilities would remain in their current locations, in their current conditions, and at their current capacities. Current access to the Merced River gorge would continue to be limited by available roadside parking along the shoulder of El Portal Road; at two off-road, paved parking lots; and at the paved parking lot next to the Arch Rock Entrance Station. Current trends would likely continue under Alternative 1, exacerbating traffic back-ups at the Arch Rock entrance station and reducing performance at the intersection of Highways 140 and 120. Public

transportation routes would not change. For these reasons, there would be local, long-term, minor, adverse impacts associated with transportation conditions (traffic flow and parking for automobiles and charter buses) in certain portions of Segments 3 and 4 under Alternative 1 (No Action).

**Segments 3 & 4 Impact Summary:** There would be local, long-term, minor, adverse impacts associated with transportation conditions (traffic flow and parking for automobiles and charter buses) in Segments 3 and 4 under Alternative 1 (No Action).

### **Segment 7: Wawona**

**Roadway System.** There would be no changes to the roadway system in Segment 7 under Alternative 1 (No Action), and no transportation impacts would occur.

**Traffic Flow Conditions.** As described in the Affected Environment section above, the number of vehicles on park roads has increased over the years, but traffic conditions on Wawona Road are typically acceptable along the South Fork Merced River where Wawona Road crosses and then follows the river. On peak summer days, when the Mariposa Grove parking lots reach capacity, motorists are directed to drive to Wawona and take the shuttle bus back to Mariposa Grove. This relieves pressure on parking areas near Mariposa Grove, but exacerbates congestion and poor traffic circulation in Wawona during peak summer days. Segmentwide, long-term, minor to moderate, adverse impacts would continue to occur at busy intersections in Wawona, and likely worsen as visitation levels increase by an average of 3% per year, under Alternative 1 (No Action).

**Charter Buses.** There would be no changes to the management of charter bus access to the park in Segment 7 under Alternative 1 (No Action). The demand for charter bus parking currently is not met by the supply. There could be segmentwide, long-term, minor, adverse impacts associated with parking demand continuing to exceed the supply.

**Wawona Shuttle Bus System.** No new shuttle stops would be added under Alternative 1 (No Action). There could be segmentwide, long-term, minor, adverse impacts associated with continuing crowding on Wawona shuttle buses, and service delays for those buses, as they are slowed by traffic congestion on area roads.

**Parking Areas.** The existing parking supply for private automobiles (day visitors and employees) and commercial tour buses would remain unchanged in Segment 7 under Alternative 1 (No Action). There could be segmentwide, long-term, minor, adverse impacts associated with parking demand continuing to exceed supply, likely worsening as visitation levels increase by an average of 3% per year.

**Segment 7 Impact Summary:** There could be segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7 under Alternative 1 (No Action) from the continuation of current transportation management actions to address increases in park visitation, traffic volumes on the park roadways, and parking demand that exceeds the parking supply (i.e., a larger parking deficit).

### Summary of Impacts from Alternative 1 (No Action)

Overall, with the assumed continuing increases in visitation and associated traffic volumes and parking demand, increased traffic congestion, pedestrian-vehicle conflicts, and inappropriate roadside parking would be clearly detectable (experienced by 10% to 20% of visitors). Therefore, Alternative 1 (No Action) would result in segmentwide, long-term, moderate, adverse impacts on transportation conditions.

### Cumulative Impacts from Alternative 1: No-Action

Cumulative effects to transportation discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of the no-action alternative. The projects identified below include only those projects that could affect transportation within the river corridor or in the park vicinity.

#### *Past Actions*

Past actions have resulted in both adverse and beneficial impacts on transportation. The majority of past projects listed in Appendix B (e.g., Yosemite Valley Loop Road Rehabilitation, completed in 2008, South Entrance Exit Lane Project, completed in 2012, and Wawona Road Rehabilitation Project completed in 2011) had short-term, adverse effects on transportation conditions in the corridor (i.e., associated with construction-related increases in traffic volumes on park roads), which have no net adverse or beneficial effects on current or future transportation conditions. The following past projects had long-term, minor, beneficial effects on transportation conditions, which would continue under Alternative 1:

- The YARTS is a regional transportation system established in 2000, whose intent is to provide an alternative to private vehicles by expanding the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also provides a means for visitors to travel to the Valley when restricted access measures are implemented for private vehicles during times of severe congestion. YARTS has a corridorwide, long-term, moderate, beneficial effect by reducing the number of day visitors arriving in private vehicles.
- El Portal Road improvement projects had both adverse (short-term during construction) and beneficial (long-term) effects on transportation. Short-term, construction-related effects included visitor delays and visitor safety through the construction work zone. Those effects were mitigated by implementation of a traffic control plan, with measures such as strict construction timing restrictions, roadway safety procedures, flaggers, and signaling. Safety improvements on El Portal Road facilitate regional transit service on that route, which is a segmentwide, long-term, minor, beneficial impact.
- Housing Projects (i.e., Curry Village Employee Housing, Curry Village Huff House Temporary Housing, Yosemite Valley Lost Arrow Temporary Employee Housing, and Yosemite Valley Ahwahnee Temporary Employee Housing) included the construction of housing and related facilities to accommodate concessioner employees. The housing units replaces concessioner housing lost in the January 1997 flood and the rockfall events at Curry Village in October 2008, and were developed in consultation with litigants as part of a settlement agreement concerning

the *Merced Wild and Scenic River Comprehensive Management Plan/DEIS*. These actions provide temporary lodging for concessioner employees, and were needed to help meet immediate short-term housing needs for the park concessioner until permanent employee housing is available. Construction was completed between 2007 and 2009. These projects have a corridorwide, long-term, moderate, beneficial effect by reducing the number of employee commute trips to and from the park.

- Yosemite Valley Shuttle Bus Stop Improvements consisted of the preparation of preliminary design plans, environmental compliance documents, and construction drawings; the construction of six, 10-foot by 80-foot concrete braking pads, and the rehabilitation or replacement of 94,000 square feet of asphalt road approaches and the construction of bus stop shelters. Construction was completed in 2010. These improvements support shuttle bus service in the Valley, which is a segmentwide, long-term, minor, beneficial impact.

### ***Present Actions***

Present actions proposed in the Yosemite region are separated below into four general categories: (1) projects anticipated to have a net beneficial effect; (2) projects anticipated to have both beneficial and adverse effects; (3) projects anticipated to have adverse effects; and (4) projects anticipated to have a no-net adverse or beneficial effect.

Present projects that could have a cumulative corridorwide, long-term, moderate, beneficial effect on transportation include:

- Increased YARTS services
- Changeable electronic signs in Mariposa, Midpines, and El Portal, alerting drivers of traffic conditions in Yosemite Valley
- Computer-Aided Dispatch / Automatic Vehicle Locator
- Web-based Traffic Forecasts to inform travelers of traffic congestion (heavy, moderate or light) in different areas of the park (Yosemite Valley, Tuolumne Meadows, Wawona and Mariposa Grove, and Glacier point). Travelers can also sign up to receive the forecasts via email. The aforementioned actions would individually, and in combination, encourage travel to the park by alternative (nonprivate vehicle) modes.

Present projects that could have a short-term, adverse effect, but a cumulative long-term, beneficial effect on transportation include:

- South Park Intelligent Transportation System to let visitors know when parking lots are full
- Parking alternative option at the El Portal Administrative Site
- The South Entrance Station Kiosk Replacement
- The Restoration of Mariposa Grove Ecosystem Project
- Parkwide Communication Data Network infrastructure upgrade.

Although the above projects would have some site-specific, short-term, adverse affects (e.g., construction-related transportation effects), the general goal of each of these projects is to improve transportation circulation and safety.

Present projects that could have a short-term, adverse effect on transportation include:

- Ahwahnee Comprehensive Rehabilitation Plan
- East Yosemite Valley Utilities Improvement Plan
- Rehabilitate (pulverize and repave) approximately 25 miles of the Wawona Road between Southside Drive and South Entrance. Only minimal work at turnouts and intersections, which will be within the existing paved footprint.
- The Ahwahnee Hotel Improve Porte Cochère Access Walkways and Fence project, which would replace rotted wooden components along (1) the uncovered wood-plank walkway that runs along the service yard fence to the porte cochère, (2) the service yard fence, and (3) the wood-plank boardwalk in the main entry gallery
- Parkwide pavement preservation program that requires temporary road closures for various segments of roads in the corridor

The adverse effects associated with the projects listed above would be short term and primarily related to construction-generated traffic on roadways serving the project sites. There would be no net, long-term, adverse or beneficial effects on transportation.

Present projects anticipated having no net, long-term or short-term, adverse or beneficial effects on transportation include:

- Commercial Use Authorization for Commercial Activities, to regulate and oversee operations of permit holders involved in conducting commercially-guided day hiking, overnight backpacking, fishing, photography workshops, stock use (pack animal trips and pack support trips for hikers), and Nordic skiing activities in Yosemite.

The continuation of transportation-related maintenance improvements and resource protection measures such as repaving, and trail, parking, and roadway delineation would have short-term, minor, adverse effects on transportation during construction, including visitor delays and visitor safety through the construction work zones. Those effects would be mitigated by implementation of a traffic control plan, with measures such as strict construction timing restrictions, roadway safety procedures, and flaggers.

Restricted access measures would continue to control the volume of incoming vehicles when traffic and parking conditions in Yosemite Valley are over congested. The YARTS would continue to reduce the number of individual vehicles operated within the park. These actions would have segmentwide, long-term, moderate, beneficial effects on transportation.

### ***Reasonably Foreseeable Future Actions***

Similar to past actions, reasonably foreseeable future actions would result in both adverse and beneficial impacts on transportation. Reasonably foreseeable future projects that could have short-term, adverse effects on transportation associated with construction activities include the following:

- **Concessioner Parking Lot Restoration Project.** Concessioner-assigned paved parking areas would be replaced to a maintainable condition and to provide safe access for visitors and staff. Currently, paved parking areas have substantial deterioration from age, construction activities, tree root lift, rodent activity, and extreme weather. Numerous potholes, annual patching, and excessive cracks exist, causing safety and concerns related to Americans with Disabilities Act and Architectural Barriers Act Accessibility Standards requirements. As part of this project, paved areas would be evaluated individually for proper drainage, elevations, curbing, striping, and improved efficiency. The existing parking area footprints would be retained as designated in the concessions contract for concessioner land assignments. This project would not expand any parking areas, nor would it add any parking spaces.
- **Curry Village Rehabilitation of Historic Cabins with Bath Structures** would address a rehabilitation program for the 26 guest cabins with baths that are still being used for guest accommodations on the western side of Curry Village just north of the rockfall hazard zone. This project is currently in the design stage and would be implemented in a multi-year phased project.
- **The Ahwahnee Dormitory Seismic Upgrades** would replace the foundation with a permanent foundation to provide long-term structural stabilization of the dormitory building. The project also will include an evaluation of the existing utilities and components located under the building floor, the building floor structure, structural elements of the building, and soil erosion and drainage issues to determine if these elements should be replaced or rehabilitated as part of the project. This project is tentatively scheduled for 2012.
- **Parkwide pavement preservation program** that requires temporary road closures for various segments of roads in the corridor.

The park anticipates that visitor demand would increase, which could exacerbate traffic congestion on park roads. Reasonably foreseeable future projects that could have a cumulative long-term, beneficial effect on transportation by encouraging travel to the park by alternative (non-private vehicle) modes or improving transportation infrastructure outside of the river corridor include the following:

- **Transit Passenger Information System.** This project will enable improved communication to park visitors on the status of the park's shuttle buses through development of a visitor information system for all the shuttle bus systems in Yosemite Valley, Mariposa Grove/Wawona, Badger Pass, and Tioga Road.

Other beneficial impacts for reasonably foreseeable future actions would be similar to those discussed for past and present actions (i.e., the restricted access measures and increased YARTS services). Reducing traffic congestion and encouraging travel to the park by alternative (non-private vehicle) modes would have segmentwide, long-term, moderate, beneficial effects on transportation.

***Overall Cumulative Impact***

Cumulative projects are not anticipated to affect transportation conditions on Segments 1, 5, 6, and 8 (wilderness segments accessible only by trails, not roads), and therefore, no cumulative impacts would occur. For segments 2, 3, 4 and 7, camping, lodging, parking, and circulation facilities are assumed to remain in their current locations, in their current conditions, and at their current capacities.

Consequently, traffic congestion and delays would continue to occur at busy intersections and could worsen somewhat if visitation levels increase in the future. Congestion and delays would be segment-wide, long-term, minor, adverse impacts on transportation conditions.

***Environmental Consequences of Actions Common to Alternatives 2–6*****All River Segments*****Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values that are common to Alternatives 2–6 would primarily have local, short-term, minor adverse transportation effects associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the restoration work. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

There would be no visitor use or transportation actions common to Alternatives 2–6. However, some form of day use parking permit system would be common to Alternatives 2–6, but the specifics of the system would vary for each alternative. The amount of overnight accommodations and day parking and transit options would vary by alternative, and each alternative would accommodate different levels of peak use demand for visitation in the Valley, as described under each alternative.

**Segment 2: Yosemite Valley*****Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values common to Alternatives 2–6 in Segment 2 would primarily have short-term transportation effects, associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the restoration work. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.



### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions common to all alternatives within Segment 2 that are proposed to specifically address transportation conditions include adding a 41-space parking lot for Camp 4 campground, allocating parking spaces for 15 tour buses within the redeveloped day use parking area west of Yosemite Lodge, and constructing a shuttle bus stop near Camp 4. Construction activities may result in minor delays in the short-term, but once operational, these actions would result in segment-wide, long-term, minor beneficial impacts to transportation conditions, as traffic congestion would be somewhat lessened during periods of peak visitor use. In addition, the relocation of the Concessioner Garage service to the Government Utility Building would allow for an expansion of parking areas within Camp 6, also resulting in segment-wide, long-term, minor beneficial impacts. Other actions associated with overnight accommodations and facilities that are common to all alternatives in Segment 2, including actions associated with the Huff House temporary housing area, Curry Village services and facilities, the western expansion of Backpackers Campground, the eastward expansion of Camp 4, and the removal of old and temporary housing at Highland Court and the Thousands Cabins would have a segment-wide, long-term, negligible beneficial impact to transportation conditions.

**Segment 2 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, negligible to minor, beneficial impacts on transportation and circulation within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values common to Alternatives 2–6 in Segments 3 and 4 would primarily have short-term transportation effects, associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the restoration work. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions common to all alternatives associated with visitor use management and facilities within Segments 3 and 4 include constructing infill housing units in vacant lots in old El Portal. Construction activities may result in minor delays in the short-term, but once operational, this action would result in local, long-term, negligible beneficial impact to transportation conditions impacts to transportation as a small amount of traffic is removed from Segment 2.

**Segments 3 & 4 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, negligible, beneficial impacts on transportation and circulation within Segments 3 & 4.

## Segment 7: Wawona

### *Impacts of Actions to Protect and Enhance River Values*

Actions to protect and enhance river values common to Alternatives 2–6 in Segment 7 would primarily have short-term transportation effects, associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the restoration work. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

There would be no visitor use or transportation actions common to Alternatives 2–6 in Segment 7. The amount of overnight accommodations and day parking and transit options would vary by alternative, and each alternative would accommodate different levels of peak use demand for visitation to Wawona, as described under each alternative.

**Segment 7 Impact Summary:** Impacts of actions common to Alternatives 2–6 would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.

### Summary of Impacts Common to Alternatives 2–6

Impacts common to all segments under Alternatives 2–6 would result in corridorwide, short-term, negligible to minor, adverse impacts on traffic, transit, and tour bus services and parking areas associated with restoration activities. Operational impacts common to all segments under Alternatives 2–6 would result in corridorwide, long-term, negligible to minor, beneficial impacts on traffic, transit, tour bus services and parking areas with implementation of these actions.

## *Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration*

### All River Segments

#### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 2, actions to protect and enhance river values would primarily have corridorwide, short-term, minor, adverse transportation effects associated with restoration activities (e.g., removal of Sugar Pine, Ahwahnee, and Stoneman bridges to preserve the free-flowing condition of the Merced River). The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 2, actions to manage visitor use and facilities would slightly decrease opportunities for camping in the river corridor and decrease lodging, expand regional bus service, decrease day parking, and improve traffic circulation by a marked reduction in visitor use through a day use parking permit system for the East Yosemite Valley during the peak season. Permit compliance would be checked at park entrance stations and, secondarily, at Yosemite Valley locations or parking areas. These management actions would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, in Segment 2, actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities. However, traffic flow and circulation would be improved through the rerouting of Northside Drive south of the Camp 6 parking area (which would be relocated north of the current location, closer to the Yosemite Village). No roundabouts would be necessary under Alternative 2. While a pedestrian undercrossing would not be necessary, Alternative 2 would construct an at-grade pedestrian crossing west of the intersection of Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts. Additionally, the intersection at Sentinel Bridge would be redesigned and Southside Drive would switch to a two-way road. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 2, in Segment 2, actions to manage visitor use and facilities include a traffic and parking management program. About 537 fewer parking spaces would be provided in Yosemite Valley, based on a calculation of the parking needed to accommodate the reduced use levels in the river corridor; no parking would be added in the West Valley. Due to the reductions in the supply of day parking with Alternative 2 as compared to current peak demand, a day use parking permit system would be instituted for East Yosemite Valley. This system would be provided during the peak use season on a mixed first come, first served and advance reservation basis. Permits would be checked at entrance stations and secondarily at Valley locations or parking areas, and day use would be limited to 9,400 visitors per day.

The total number of daily visitors to East Yosemite Valley under Alternative 2 would be 13,900 people, an approximately 33% decrease from existing peak-day conditions. At this level of visitation, there would not be a need for overflow parking during times of peak visitation. The amount of overnight lodging would decrease substantially from existing conditions under Alternative 2 in Segment 2, from 1,034 units to 556 units. The number of campsites in Segment 2 would decrease slightly, from 462 to 450 sites.

Regional bus service into Yosemite Valley would be expanded during the peak summer season under Alternative 2 with new service on the Highway 41 corridor.

Transportation and circulation would be improved due to the day use parking permit system, and the resulting substantially lower use levels. When combined, these actions would have segmentwide, moderate, long-term, beneficial impacts on transportation conditions within Yosemite Valley.

**Segment 2 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, moderate, beneficial impacts on transportation and circulation within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, in Segments 3 and 4, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities as described for Segment 2.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 2, no significant changes to the kinds and amounts of use are proposed in Segment 3, and the only change in Segment 4 would be increased employee housing (added to replace the housing removed from the Valley). The total number of daily visitors to actively recreate in Segments 3 and 4 with Alternative 2 would not change from existing peak-day conditions.

Public transit options along Segments 3 and 4 would be expanded the same as described for Segment 2. Segment 3 is considered a “pass through” segment and, therefore, it does not contain any stops for passengers to enter or depart from transportation services that travel along this corridor. When combined, these actions would have segmentwide, minor, long-term, beneficial impacts on transportation conditions.

**Segments 3 & 4 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, minor, beneficial impacts on transportation and circulation within Segments 3 & 4.

### **Segment 7: Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, in Segment 7, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the restoration work.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 2, no significant changes to the kinds and amounts of use in Segment 7 are proposed. The total number of daily visitors to Segment 7 under Alternative 2 would increase slightly over Alternative 1 peak-day levels, primarily due to increased transit use.

**Segment 7 Impact Summary:** Impacts of Alternative 2 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Transportation conditions under Alternative 2 would be improved (reduced crowding and congestion) from management of visitor use to lower levels through the implementation of a day use parking permit system for East Yosemite Valley, expanded regional transit service, improved circulation patterns, and reduced vehicle-pedestrian conflicts. Although the number of parking spaces would be reduced, the lower visitor level would reduce the ratio of visitors to parking spaces, an improvement that would be clearly detectable (by 10% to 20% of visitors traveling in the Merced River corridor) during the peak season of visitation. Overall, with implementation of mitigation measures MM-TRA-1 through MM-TRA-5, as applicable (see Appendix C), Alternative 2 would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

The past, present, and foreseeable projects that would affect transportation in the river corridor under Alternative 2 would be the same as those under Alternative 1. Alternative 2, in combination with these cumulative projects, would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through current and reasonably foreseeable projects would further enhance the moderate, long-term, beneficial impacts on transportation that would result from the implementation of Alternative 2.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 3, actions to protect and enhance river values would primarily have corridorwide, short-term, minor, adverse transportation effects associated with restoration activities (e.g., removal of Sugar Pine, Ahwahnee, and Stoneman bridges to preserve the free-flowing condition of the Merced River). The transportation effects of changes to the amount of overnight accommodation

(i.e., campsites and lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Under Alternative 3, actions to manage visitor use and facilities would slightly decrease opportunities for camping in the river corridor and decrease lodging, expand regional bus service, decrease day parking, and improve traffic circulation by a marked reduction in visitor use through a day use parking permit system for the East Yosemite Valley during the peak season. Permit compliance would be checked at on-site parking locations. These management actions would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

## **Segment 2: Yosemite Valley**

### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 3, in Segment 2, actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities. However, traffic flow and circulation would be improved through the rerouting of Northside Drive south of the Camp 6 parking area (which would be relocated north of the current location, closer to the Yosemite Village). No roundabouts would be necessary under Alternative 3. While a pedestrian undercrossing would not be necessary, Alternative 3 would construct an at-grade pedestrian crossing west of the intersection of Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts. Additionally, the intersection at Sentinel Bridge would be redesigned and Southside Drive would switch to a two-way road. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Under Alternative 3, in Segment 2, actions to manage visitor use and facilities include a traffic and parking management program. About 740 fewer parking spaces would be provided in the Valley, based on a calculation of the parking needed to accommodate the reduced use levels in the river corridor; no parking would be added in the West Valley. Due to the reductions in the supply of day parking with Alternative 3 as compared to current peak demand, a day use parking permit system would be instituted for the East Yosemite Valley. This system would be provided during the peak use season on a mixed first come, first served and advance reservation basis. Permits would be checked at on-site parking locations, and day use would be limited to 8,500 visitors per day.

The total number of daily visitors to East Yosemite Valley under Alternative 3 would be 13,200 people, an approximately 37% decrease from existing peak-day conditions. At this level of visitation, there would not be a need for overflow parking during times of peak visitation. The amount of overnight lodging would decrease substantially from existing conditions under Alternative 3 in Segment 2, from 1,034 units to 621 units. The number of campsites in Segment 2 would increase slightly, from 462 to 477 sites.

Regional bus service into Yosemite Valley would be expanded during the peak summer season under Alternative 3 with new service on the Highway 41 corridor.

Transportation and circulation would be improved with substantially lower use levels. When combined, these actions would have segmentwide, moderate, long-term, beneficial impacts on transportation conditions within Yosemite Valley.

**Segment 2 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, moderate, beneficial impacts on transportation and circulation within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 3, in Segments 3 and 4, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities.

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Under Alternative 3, no significant changes to the kinds and amounts of use are proposed in Segment 3, and the only change in Segment 4 would be increased employee housing (added to replace the housing removed from the Valley). The total number of daily visitors to actively recreate in Segments 3 and 4 with Alternative 3 would not change from existing peak-day conditions.

Public transit options along Segments 3 and 4 would be expanded as described for Segment 2 above. Segment 3 is considered a “pass through” segment and therefore it does not contain any stops for passengers to enter or depart from transportation services that travel along this corridor. When combined, these actions would have segmentwide, minor, long-term, beneficial impacts on transportation conditions.

**Segments 3 & 4 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, minor, beneficial impacts on transportation and circulation within Segments 3 & 4.

### **Segment 7: Wawona**

#### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 3, in Segment 7, actions to protect and enhance river values would have segment, short-term, minor, adverse transportation effects associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 3, no significant changes to the kinds and amounts of in use Segment 7 are proposed. The total number of daily visitors to Segment 7 under Alternative 3 would increase slightly over Alternative 1 peak-day levels, primarily due to increased transit use.

**Segment 7 Impact Summary:** Impacts of Alternative 3 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.

**Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Transportation conditions under Alternative 3 would be improved (reduced crowding and congestion) by management of visitor use to lower levels through the implementation of a day use parking permit system for the East Yosemite Valley, expanded regional transit service, improved circulation patterns, and reduced vehicle-pedestrian conflicts. Although the number of parking spaces would be reduced, the lower visitor level would reduce the ratio of visitors to parking spaces, an improvement that would be clearly detectable (by 10% to 20% of visitors traveling in the Merced River corridor) during the peak season of visitation. Overall, with implementation of mitigation measures MM-TRA-1 through MM-TRA-5, as applicable (see Appendix C), Alternative 3 would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

**Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The past, present, and foreseeable projects that would affect transportation in the Merced River corridor under Alternative 3 would be the same as those under Alternative 1. Alternative 3, in combination with these cumulative projects, would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through current and reasonably foreseeable projects would further enhance the moderate, long-term, beneficial impacts on transportation that would result from Alternative 3.

***Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration*****All River Segments*****Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, actions to protect and enhance river values would primarily have corridorwide, short-term, minor, adverse transportation effects associated with restoration activities (e.g., removal of Sugar Pine and Ahwahnee bridges to preserve the free-flowing condition of the Merced River). The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and



lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 4, actions to manage visitor use and facilities would slightly decrease opportunities for camping in the river corridor and decrease lodging, expand regional bus service, decrease day parking, and improve traffic circulation through a marked reduction in visitor use. A proactive on-site, day use traffic and parking management program would be implemented to encourage dispersion of visitation to the park's most congested areas. Overflow parking during times of peak visitation would be provided in El Portal at the Abbieville site, with the NPS shuttle system expanded to serve this new location. These management actions would have corridorwide, minor, long-term, beneficial impacts on transportation conditions.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, in Segment 2, actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities. Construction activities would include the removal of a portion of Southside Drive through Stoneman Meadow and realignment of the road through the Boys Town area. Northside Drive would be retained in its current configuration, though Northside Drive would be re-aligned at Village Drive to meet standards for a proper four-way intersection and improved performance. No roundabouts would be necessary under Alternative 4. A pedestrian underpass (at Yosemite Lodge/Yosemite Falls crossing) would be constructed. A three-way intersection would be added from Sentinel Drive to the Yosemite Village Day Use Area Parking Lot to improve traffic flow and to alleviate congestion at nearby intersections. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 4, in Segment 2, actions to manage visitor use and facilities include a traffic and parking management program. About 292 fewer parking spaces would be provided in Yosemite Valley, based on a calculation of the parking needed to accommodate the reduced use levels in the river corridor; no parking would be added in the West Valley. Due to the reductions in the supply of day parking under Alternative 4 as compared to current peak demand, a system of parking fees, and traffic and parking diversions would be instituted. This system would be provided during the peak use season to manage parking for visitors to the East Valley. Visitor orientation and wayfinding would be improved by linking the Camp 6 parking lot to Yosemite Village visitor services via an underpass and pathways. Traffic congestion would be mitigated with the provision of a pedestrian underpass at Yosemite Lodge.

The total number of daily visitors to the East Valley under Alternative 4 would be 17,000 people, an approximate 19% decrease from existing peak-day conditions. The amount of overnight lodging

would decrease slightly from existing conditions under Alternative 4 in Segment 2, from 1,034 units to 823 units. The number of campsites in Segment 2 would increase, from 466 to 701 sites.

Regional bus service into Yosemite Valley would be expanded during the peak summer season under Alternative 4, with new service on the Highway 41 corridor. Additionally, the Valley shuttle would be extended to the West Valley and serve the El Capitan crossover and Bridalveil Fall areas.

Transportation and circulation would be improved due to lower use levels. When combined, these actions would have segmentwide, moderate, long-term, beneficial impacts on transportation conditions within Yosemite Valley.

**Segment 2 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, moderate, beneficial impacts on transportation and circulation within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, in Segments 3 and 4, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 4, no significant changes to the kinds and amounts of use are proposed in Segment 3, and the only changes in Segment 4 would be the development of a new remote parking area and increased employee housing (added to replace the housing removed from Yosemite Valley). The total number of daily visitors to actively recreate in Segments 3 and 4 with Alternative 4 would not change from existing peak-day conditions.

A new remote, 200-space visitor day parking area would be provided at the Abbieville/Trailer Court area in Segment 4, primarily to be used for visitor access to Yosemite Valley. The use associated with this parking area is accounted for in the Valley daily visitation levels reported for Segment 2 above. Public transit options along Segments 3 and 4 would be expanded as described for Segment 2 above. Segment 3 is considered a “pass through” segment, and therefore, it does not contain any stops for passengers to enter or depart from transportation services that travel along the river corridor through the Merced River gorge. Regional transit buses in Segment 4 would stop at the new day parking area. When combined, these actions would have segmentwide, minor, long-term, beneficial impacts on transportation conditions.

**Segments 3 & 4 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, minor, beneficial impacts on transportation and circulation within Segments 3 & 4.

## **Segment 7: Wawona**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, in Segment 7, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 4, no significant changes to the kinds and amounts of use in Segment 7 are proposed. The total number of daily visitors to Segment 7 under Alternative 4 would increase slightly over Alternative 1 peak-day levels, primarily due to increased transit use.

**Segment 7 Impact Summary:** Impacts of Alternative 4 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.

## **Summary of Impacts from Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration**

Transportation conditions under Alternative 4 would be improved (reduced crowding and congestion) by management of visitor use to lower levels through the implementation of a parking fee, and traffic and parking diversion system, expanded regional transit and Valley shuttle service, improved circulation patterns, and reduced vehicle-pedestrian conflicts. Although the number of parking spaces would be reduced, the lower visitor level would reduce the ratio of visitors to parking spaces, an improvement that would be slightly detectable (by 5% to 10% of visitors traveling in the Merced River corridor) during the peak season of visitation. Overall, with implementation of mitigation measures MM-TRA-1 through MM-TRA-5, as applicable (see Appendix C), Alternative 4 would have corridorwide, minor, long-term, beneficial impacts on transportation conditions.

## **Cumulative Impacts from Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration**

The past, present, and foreseeable projects that would affect transportation in the Merced River corridor under Alternative 4 would be the same as those described above for Alternative 2. Alternative 4, in combination with these cumulative projects, would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through current and reasonably foreseeable project would further enhance the moderate, long-term, beneficial impacts on transportation that would result from the implementation of Alternative 4.

## ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, actions to protect and enhance river values would primarily have corridorwide, short-term, minor, adverse transportation effects associated with restoration activities. The transportation effects of changes to the amount of overnight accommodations (i.e., campsites and lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 5, actions to manage visitor use and facilities would increase opportunities for camping in the river corridor and slightly increase lodging, expand regional bus service, increase day parking in three primary areas (the West Valley, Yosemite Lodge, and El Portal), and improve traffic circulation with a new traffic circle and a pedestrian underpass in Yosemite Valley. Alternative 5 also would include a traffic and parking management program, which while focused on the Valley, would improve transportation conditions parkwide. Alternative 5 would accommodate current average day use for the summer season. These management actions would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, in Segment 2, actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities. Northside Drive would be retained in its current configuration, but a traffic circle (at the Northside Drive / Village Drive [Camp 6] intersection) and a pedestrian underpass (at Yosemite Lodge/Yosemite Falls crossing) would be constructed. A three-way intersection would be added from Sentinel Drive to the Yosemite Village Day Use Area Parking Lot to improve traffic flow and to alleviate congestion at nearby intersections. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 5, in Segment 2, actions to manage visitor use and facilities include a traffic and parking management program, additional parking, and changes to camping and overnight accommodations. The total number of daily visitors to East Yosemite Valley under Alternative 5 would be 19,900 people, an approximately 5% decrease from existing peak-day conditions.

The day use capacity management system under Alternative 5 would include a phased-in progressive management plan for reducing overall congestion and would reduce crowding and congestion in Segment 2 on peak-use days. This would lead to a day use parking permit system for the East Yosemite Valley if day use visitation to the East Yosemite Valley from private vehicles exceeds the parking availability and formal traffic diversions at El Capitan Crossover are instituted for 14 days or more during the summer season for two consecutive years. Permits would be checked at on-site parking locations, and day use would be limited to 12,800 visitors per day. Both regional transit and Valley shuttle options would be expanded, the latter extended to the West Valley to serve the El Capitan crossover and Bridalveil Fall areas. Vehicles driving into Yosemite Valley on peak-use days would be subject to transportation fees, directed to overflow parking in the West Valley, and ultimately require a parking reservation. The management system would improve transportation conditions in the Valley, particularly on peak days.

Under Alternative 5, the amount of overnight lodging would remain essentially the same as existing conditions in Segment 2, increasing slightly from 1,034 units to 1,053 units. The number of campsites in Segment 2 would increase from 462 to 640 sites, a 39% increase.

In addition to the day use capacity management system, transportation and parking improvements would improve traffic flow and circulation. About 111 parking spaces would be added in Segment 2, a 5% increase over the spaces currently available (including 100 overflow parking spaces in the West Valley), which would reduce vehicles circulating through Yosemite Valley looking for parking. The above-mentioned traffic circle and a pedestrian underpass would result in less congestion and enhanced pedestrian safety.

Regional bus service into Yosemite Valley would be expanded during the peak summer season under Alternative 5. The regional transit service would accommodate both employees and visitors and would add an additional stop at the El Portal remote day use parking area. Additionally, the Valley shuttle would be extended to the West Valley to serve the El Capitan crossover and Bridalveil Fall areas.

Although the total number of daily visitors to East Yosemite Valley would be only slightly reduced from existing peak-day numbers, the implementation of the day use capacity management system, additional parking spaces, and transportation system improvements would lessen traffic jams, and improve the chance that visitors entering Yosemite have a place to park (thus eliminating unnecessary circling). When combined, these actions would have segmentwide, major, long-term, beneficial impacts on transportation conditions within Yosemite Valley.

**Segment 2 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, major, beneficial impacts on transportation and circulation within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, in Segments 3 and 4, actions to protect and enhance river values would have segmentwide, minor, adverse short-term transportation effects associated with restoration activities.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 5, no significant changes to the kinds and amounts of use are proposed in Segment 3, and the only changes in Segment 4 would be the development of a new remote parking area and increased employee housing (added to replace the housing removed from the Valley). The total number of daily visitors to actively recreate in Segments 3 and 4 under Alternative 5 would not change from existing peak-day conditions.

A new remote, 200-space visitor day parking area would be provided at the Abbieville/Trailer Court area in Segment 4, primarily to be used for visitor access to Yosemite Valley. The use associated with this parking area is accounted for in the Valley daily visitation levels reported above for Segment 2. Public transit options along Segments 3 and 4 would be expanded as described for Segment 2 above. Segment 3 is considered a “pass through” segment, and therefore, it does not contain any stops for passengers to enter or depart from transportation services that travel along this corridor. Regional transit buses in Segment 4 would stop at the new day parking area. When combined, these actions would have segmentwide, moderate, long-term, beneficial impacts on transportation conditions.

**Segments 3 & 4 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, moderate, beneficial impacts on transportation and circulation within Segments 3 & 4.

**Segment 7: Wawona*****Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, in Segment 7, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 5, in Segment 7, no significant changes to the kinds and amounts of use are proposed. The total number of daily visitors to Segment 7 under Alternative 5 would increase slightly over Alternative 1 peak-day levels, primarily due to increased transit use.

**Segment 7 Impact Summary:** Impacts of Alternative 5 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.

**Summary of Impacts from Alternative 5: Enhanced Visitor Experience and Essential River Bank Restoration**

Under Alternative 5, the park would increase access to and the availability of parking and camping, and maintain the current levels of overnight lodging. Transportation conditions would be improved

(reduced crowding and congestion) by better management of traffic, improved circulation patterns (i.e., a traffic circle) and parking, expanded regional transit and Valley shuttle service, and reduced vehicle-pedestrian conflicts, which would be highly detectable (by more than 20% of visitors traveling in the Merced River corridor) during the peak season of visitation. Overall, with implementation of mitigation measures MM-TRA-1 through MM-TRA-5, as applicable (see Appendix C), Alternative 5 would have corridorwide, major, long-term, beneficial impacts on transportation conditions.

### **Cumulative Impacts from Alternative 5: Enhanced Visitor Experience and Essential River Bank Restoration**

The past, present, and foreseeable projects that would affect transportation in the Merced River corridor under Alternative 5 would be the same as those described for Alternative 2. Alternative 5, in combination with these cumulative projects, would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through current and reasonably foreseeable project would further enhance the moderate, long-term, beneficial impacts on transportation that would result from the implementation of Alternative 5.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, actions to protect and enhance river values would primarily have corridorwide, short-term, minor, adverse transportation effects associated with restoration activities (e.g., potential removal of Sugar Pine bridge to preserve the free-flowing condition of the Merced River). The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration (protect and enhance) actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 6, actions to manage visitor use and facilities would increase opportunities for camping in the river corridor and increase lodging, expand regional bus service, increase day parking, and improve traffic circulation with new roundabouts and a pedestrian underpass in Yosemite Valley. Alternative 6 also includes a traffic and parking management program, which while focused on the Valley, would improve transportation conditions parkwide. Alternative 6 would provide enough day parking in the river corridor to accommodate current peak use, and at an average 3% growth per year, enough parking to accommodate day use demand for the next five years. These management actions would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

## Segment 2: Yosemite Valley

### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 6, in Segment 2, actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities. Northside Drive would be retained in its current configuration, but roundabouts (at Northside Drive / Village Drive [Camp 6], and Sentinel Drive / Northside Drive [Bank 3-Way]) and a pedestrian underpass (at the Yosemite Lodge/ Yosemite Falls area) would be constructed. A three-way intersection would be added from Sentinel Drive to the Yosemite Village Day Use Area Parking Lot to improve traffic flow and to alleviate congestion at nearby intersections. The transportation effects of changes to the amount of overnight accommodation (i.e., campsites and lodging units) as part of the restoration actions are described below under Impacts of Actions to Manage User Capacity, Land Use, and Facilities.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Under Alternative 6, in Segment 2, actions to manage visitor use and facilities include a traffic and parking management program, and additional parking, camping, and overnight accommodations. The total number of daily visitors to East Yosemite Valley under Alternative 6 would be 21,800 people, an approximately 4% increase from existing peak-day conditions. Overall, Alternative 6 would accommodate the majority of peak use demand for visitation in the Valley.

Alternative 6 would include a phased-in progressive management plan for reducing overall congestion and creating a visitor-friendly traffic management program. This would include the implementation of transportation fees at entrance stations and could ultimately lead to a day use parking permit system for the East Yosemite Valley if day use visitation to the East Yosemite Valley from private vehicles exceeds the parking availability and formal traffic diversions at El Capitan Crossover are instituted for 14 days or more during the summer season for two consecutive years. Permits would be checked at on-site parking locations, and day use would be limited to 13,700 visitors per day. Both regional transit and Valley shuttle options would be expanded, the latter extended to the West Valley to serve the El Capitan crossover and Bridalveil Fall areas.

The amount of overnight lodging would increase from existing conditions under Alternative 6 in Segment 2, from 1,034 units to 1,248 units. The number of campsites in Segment 2 would increase from 462 to 739 sites.

About 261 parking spaces would be added in this segment, an 11% increase over the spaces currently available (including new visitor parking west of Yosemite Lodge [300 spaces] and in the West Valley at the El Capitan crossover [250 spaces]), which would reduce vehicles circulating through the Valley looking for parking. The above-mentioned roundabouts and pedestrian underpasses would result in less congestion and enhanced pedestrian safety.

Regional bus service into Yosemite Valley would be expanded during the peak summer season under Alternative 6. The regional transit service would accommodate both employees and visitors and would



add an additional stop at the El Portal remote day use parking area. Additionally, the Valley shuttle would be extended to the West Valley to serve the El Capitan crossover and Bridalveil Fall areas.

Although the total number of daily visitors to East Yosemite Valley would be slightly higher than existing peak-day numbers, the implementation of the day use capacity management system, additional parking spaces, and transportation system improvements would lessen traffic jams, and ensure that visitors entering the park have a place to park (thus eliminating unnecessary circling). These management actions would have segmentwide, moderate, long-term, beneficial impacts on transportation conditions.

**Segment 2 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, moderate, beneficial impacts on transportation and circulation within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, in Segments 3 and 4, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 6, no significant changes to the kinds and amounts of use are proposed in Segment 3, and the only changes in Segment 4 would be the development of a new remote parking area and increased employee housing (added to replace the housing removed from the Valley). The total number of daily visitors to actively recreate in Segments 3 and 4 with Alternative 6 would not change from existing peak-day conditions.

A new remote 200-space visitor day parking area would be provided at the Abbieville/Trailer Court site in Segment 4, primarily to be used for visitor access to Yosemite Valley. The use associated with this parking area is accounted for in the Valley daily visitation levels reported above for Segment 2. Public transit options along Segments 3 and 4 would be expanded as described for Segment 2. Segment 3 is considered a “pass through” segment, and therefore, it does not contain any stops for passengers to enter or depart from transportation services that travel along this corridor. Regional transit buses in Segment 4 would stop at the new day parking area. These management actions would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

**Segments 3 & 4 Impact Summary:** Actions to manage user capacities, land use, and facilities would have segmentwide, long-term, moderate, beneficial impacts on transportation and circulation within Segments 3 & 4.

## **Segment 7: Wawona**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, in Segment 7, actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under Alternative 6, in Segment 7, no significant changes to the kinds and amounts of use are proposed. The total number of daily visitors to Segment 7 under Alternative 6 would increase slightly over Alternative 1 peak-day levels, primarily due to increased transit use.

**Segment 7 Impact Summary:** Impacts of Alternative 6 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Transportation conditions under Alternative 6 would be improved (reduced crowding and congestion) by changes to the roadway network (i.e., roundabouts and pedestrian underpasses) to improve traffic flow and reduce pedestrian/vehicle conflicts), visitor and parking management strategies, and expanded regional transit and Valley shuttle service. Alternative 6 would provide enough day parking in the river corridor to accommodate current peak use, and with circulation changes, the improvements would be clearly detectable (by 10% to 20% of visitors traveling in the Merced River corridor) during the peak season of visitation. Overall, with implementation of mitigation measures MM-TRA-1 through MM-TRA-5, as applicable (see Appendix C), Alternative 6 would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The past, present, and foreseeable projects that would affect transportation in the Merced River corridor under Alternative 6 would be the same as those presented above for Alternative 2. Alternative 6, in combination with these cumulative projects, would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through current and reasonably foreseeable projects would further enhance the moderate, long-term, beneficial impacts on transportation that would result from implementation of Alternative 6.

## **Energy Consumption and Climate Change**

### ***Affected Environment***

This discussion is not organized by river segment because impacts related to energy consumption and climate change tend not to be specific to the segments.

### ***Regulatory Framework***

#### **Federal Laws and Policies**

##### ***The Energy Policy Act***

The Energy Policy Act of 2005 contains several provisions designed to reduce energy use by federal agencies. These include annual energy reduction goals, renewable energy purchase targets, reauthorization of Energy Savings Performance Contracts, required federal procurement of Energy Star or similar products, and updates to green building standards with emphasis on energy efficiency, among other measures. The act also contains an incentive program to encourage agencies to reinvest utility cost savings into future energy projects.

##### ***Energy and Independence Security Act and Corporate Average Fuel Economy Standards***

The Energy and Independence Security Act of 2007 amended the Energy Policy and Conservation Act to further reduce fuel consumption and expand production of renewable fuels. The Energy and Independence Security Act's most significant amendment includes a statutory mandate for the National Highway Traffic Safety Administration to set passenger car Corporate Average Fuel Economy standards for each model year at the maximum feasible level. This statutory mandate eliminated the former default standard of 27.5 miles per gallon. The Energy and Independence Security Act requires that standards for model years 2011 through 2020 be set sufficiently high to achieve an industrywide goal of 35 miles per gallon on average for passenger cars and light-duty trucks. The rulemaking for this goal, as requested by President Barack Obama, was divided into two parts. The first part, which was published in the Federal Register in March 2009, included standards for model year 2011 to meet the statutory deadline (i.e., March 30, 2009). The second part of the rulemaking applies to model year 2012 and subsequent years. These would be the maximum standards feasible under the limits of the Energy and Independence Security Act and the Energy Policy and Conservation Act. The National Highway Traffic Safety Administration and U.S. Environmental Protection Agency (EPA) are working in coordination to develop a national program targeting model year 2012 through 2016 passenger cars and light trucks.

##### ***U.S. Environmental Protection Agency Actions***

In response to the issue of climate change, the EPA has taken actions to regulate, monitor, and potentially reduce greenhouse gas (GHG) emissions, as briefly summarized below.

***Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act***

On April 23, 2009, the EPA published its proposed *Endangerment and Cause or Contribute Findings for Greenhouse Gases* under the Clean Air Act (Endangerment Finding) in the Federal Register. The Endangerment Finding is based on Section 202(a) of the Clean Air Act, which states that the EPA administrator should regulate and develop standards for “emission[s] of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.” The proposed rule addresses Section 202(a) in two distinct findings. The first deals with whether the concentrations of the six key GHGs (i.e., carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and thus increase the threat of climate change.

The EPA administrator proposed the finding that atmospheric concentrations of GHG endanger the public health and welfare within the meaning of Section 202(a) of the Clean Air Act. The evidence supporting this finding consists of “high atmospheric levels” of anthropogenic GHG emissions, which are likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wildfires, droughts, sea level rise, higher intensity storms) are a threat to public health and welfare.

The EPA administrator also proposed the finding that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. The proposed finding states that, in 2006, motor vehicles were the second largest contributor to domestic GHG emissions (24% of the total), behind electricity generation. Furthermore, in 2005, the United States was responsible for 18% of global GHG emissions. Thus, GHG emissions from motor vehicles and motor vehicle engines were found to contribute to air pollution that endangers public health and welfare.

On December 7, 2009, the EPA finalized its decision that GHG emissions from motor vehicles constitute an “endangerment” under the Clean Air Act. This finding allowed for the establishment of GHG emissions standards for new motor vehicles. In June 2009, in a related action, the EPA granted California a waiver under the federal Clean Air Act, allowing the state to impose its own, stricter GHG regulations for vehicles beginning in 2009.

***Notice of Intent for Development of New Greenhouse Gas and Fuel Economy Standards***

In September 2010, the National Highway Traffic Safety Administration, together with the EPA, published a Notice of Intent for the development of new GHG and fuel economy standards for vehicle model years 2017 through 2025. The agencies published a Supplemental Notice of Intent in December 2010, with a final rule due to be adopted in 2012 (NHTSA 2010).

### ***Mandatory Greenhouse Gas Reporting Rule***

On September 22, 2009, the EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year 2008 Consolidated Appropriations Act (House Rule 2764; Public Law 110-161), which required the EPA to develop “mandatory reporting of Greenhouse Gas above appropriate thresholds in all sectors of the economy.” The Reporting Rule applies to most entities that emit 25,000 metric tons of carbon dioxide equivalent or more per year. Starting in 2010, facility owners were required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandated recordkeeping and administrative requirements so that the EPA could verify annual GHG emissions reports.

### ***Executive Orders***

**Executive order 13423: Strengthening Federal Environmental, Energy, and Transportation Management.** This order calls upon all federal agencies to adopt an Environmental Management System, which is a process developed by the International Organization for Standardization. Furthermore, this order requires the Office of Management and Budget (OMB) Director to issue instructions concerning periodic evaluation, budget matter, and acquisition relating to agency implementation of the Order. OMB issues budget guidance through updates to Circular No. A-11. OMB will also continue to track agencies' progress on EO and EPACT goals through the three management scorecards on environmental stewardship, energy, and transportation.

**Executive Order 13514: Federal Leadership in Environmental, Energy and Economic Performance.** This order directs federal agencies, including the National Park Service (NPS), to measure, report, and reduce their GHG emissions from direct and indirect activities. Pursuant to Executive Order 13514, the NPS has established its Climate Friendly Parks Program. To date, many federal agencies, including the NPS, have developed GHG emission inventories and are in the process of developing emissions reduction plans.

### ***Climate Change Context***

The term *global warming* refers to the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century. The evidence of global warming is now considered indisputable (Intergovernmental Panel on Climate Change 2007), with global surface temperatures increasing an average of approximately 1.33 degrees Fahrenheit over the past 100 years. Continued warming over the next 100 years is projected to increase the average global temperature between 2 and 11 degrees Fahrenheit.

The causes of this warming have been identified as both natural processes and human activities. The Intergovernmental Panel on Climate Change concluded that variations in natural phenomena, such as solar radiation and volcanoes, produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. However, after 1950, increasing GHG concentrations resulting from human activity, such as fossil fuel burning and deforestation, have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than

45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries.

Greenhouse gasses naturally trap heat by impeding the exit of solar radiation that has entered the earth's atmosphere. Some GHGs occur naturally and are necessary for keeping the earth's surface inhabitable. However, increases in atmospheric concentrations of these gases during the past 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and causing the increase in average global temperature.

The principal GHGs of concern are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Each of the principal GHGs has a long atmospheric lifetime (one year to several thousand years). In addition, the potential heat-trapping ability of each gas varies significantly. CH<sub>4</sub> is 23 times as potent as CO<sub>2</sub>, and SF<sub>6</sub> is 22,200 times more potent than CO<sub>2</sub>. Conventionally, GHGs have been reported as CO<sub>2</sub> equivalents (CO<sub>2</sub>e). CO<sub>2</sub>e takes into account the relative potency of non-CO<sub>2</sub> GHGs and converts their quantities to an equivalent amount of CO<sub>2</sub> so that all emissions can be reported as a single quantity.

### **California Climate Trends and Associated Impacts**

Maximum (daytime) and minimum (nighttime) temperatures are increasing almost everywhere in California, though at different rates. The annual minimum temperature averaged over the entire state increased 0.33 degree Fahrenheit per decade during the period 1920 to 2003, and the annual maximum temperature increased an average of 0.1 degree Fahrenheit per decade (Moser et al. 2009).

With respect to California's water resources, the most significant impacts of global warming have been changes to the water cycle and sea level rise. Over the past century, the precipitation mix between snow and rain has shifted in favor of more rainfall and less snow (Mote et al. 2005; Knowles and Cayan 2006), and the snowpack in the Sierra Nevada range is melting earlier in the spring (Kapnick and Hall 2009). The average early-spring snowpack in the Sierra Nevada has decreased by about 10% during the last century — a loss of 1.5 million acre-feet of snowpack storage (DWR 2008). These changes have significant implications for water supply, flooding, aquatic ecosystems, forest health, and recreation, both throughout the state and within Yosemite National Park (NPS 2009H; Lutz et al. 2009; Saunders et al. 2009).

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during the demolition, construction, and operational phases. The primary GHGs associated with land use and development projects are CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O.

### ***Statewide Greenhouse Gas Emissions***

The California Air Resources Board estimated that in 2008 California produced about 478 million gross metric tons (about 525 million U.S. tons) of CO<sub>2</sub>e. The Air Resources Board found that transportation is the source of 37% of the state's GHG emissions, followed by electricity generation (both in-state and out-of-state) at 24% and industrial sources at 19%. Commercial and residential fuel use (primarily for heating) accounted for 9% of GHG emissions (CARB 2011c).

### ***Parkwide Greenhouse Gas Emissions***

**National Park Service Climate Friendly Parks Program.** Yosemite National Park is a participant in the NPS's Climate Friendly Parks Program. Funded through an interagency agreement between the EPA and the NPS, this program assists national parks in the development of short- and long-term comprehensive strategies for reducing their GHG and criteria air pollutant emissions. The program also includes a public awareness and education component.

**National Park Service Pacific West Region Directive PW-047, October 31, 2006.** This directive provides policies pertaining to renewable energy generated on-site. Specifically, it encourages conversion to renewable sources of energy, and allows for the purchase of green power (including wind, solar, biomass, and geothermal) when on-site renewable energy systems are not feasible. Alternatively, this directive also permits the purchase of green power tags, which are renewable energy certificates from a source that does not directly connect to the local utility that supplies park facilities.

**Yosemite National Park Action Plan, November 2006.** In 2006, Yosemite National Park published its first comprehensive climate action plan. The plan outlines a framework for actions the park will take to further the mission of the Climate Friendly Parks Program. Emission reduction measures identified in the plan include utilizing alternative energy sources, increasing lighting efficiency, promoting and engaging in energy-efficient building design, and optimizing energy use, among others (NPS 2006C). As part of this effort, the park committed to conducting GHG emissions inventories, monitoring progress toward emissions reductions, and to continuing to explore additional emission-reducing actions and incorporating them into subsequent climate action plans.

**NPS Green Parks Plan (GPP).** The GPP, adopted in April 2012, defines a vision and long-term strategic plan for sustainable management of NPS operations. Goals of the GPP related to GHGs include the following:

1. The NPS will reduce Scope 1 and Scope 2 GHG emissions by 35 percent by 2020 from the 2008 baseline. (Scope 1 and Scope 2 emissions are associated with on-site fossil fuel combustion and electricity consumption from the grid, respectively.)
2. The NPS will reduce Scope 3 GHG emissions by 10 percent by 2020 from the 2008 baseline. (Scope 3 emission sources such as commuter travel and off-site wastewater treatment are indirect in nature.)
3. The NPS will develop and implement guidance on adapting the location, structure, or function of park facilities in anticipation of climate change, including severe weather impacts.

**Secretarial Order 3285: Renewable Energy Development by the Department of the Interior.** This Order establishes the development of renewable energy as a priority for the Department of the Interior and establishes a Departmental Task Force on Energy and Climate Change. This Order also amends and clarifies Departmental roles and responsibilities to accomplish this goal.

**Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land and Other Natural and Cultural Resources.** This Order establishes a department-wide approach for applying scientific tools to increase understanding of climate change and to coordinate an effective

response to its impacts on tribes and on the land, water, ocean, fish and wildlife, and cultural heritage resources that the Department of the Interior manages.

**A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park.** The latest community-wide GHG inventory, depicted in **table 9-155**, presents life-cycle GHG emissions for years 2008 through 2011 and includes Scope 1, 2, and 3 emissions. The largest contribution of GHG emissions comes from the miles traveled by visitors within the park, accounting for an average of 40 percent of the inventory; followed by food consumption at 30 percent; energy (electricity and stationary fuels) at 17 percent; NPS and DNC car usage at 8 percent; waste at 3 percent; waste water at 1.6 percent; and cement at about 0.4 percent. Although fire contributes to total park emissions, wildfires would still occur even in the absence of fire management, resulting in the same level of emissions. Therefore, GHG emissions due to fire are omitted from the estimates shown here (Villalba *et al* 2012a).

**TABLE 9-155: PARK-WIDE GHG EMISSIONS FOR YEARS 2008-2011**

Scope	Source <sup>a</sup>		Year 2008	Year 2009	Year 2010	Year 2011
Scope 1 and 2 In-boundary Emissions (metric tons/yr)	Electricity		8,223	8,207	7,836	7,537
	Transportation Fuels	YNP-PTW	3,798	3,884	3,884	4,032
	Stationary Fuels	Propane	3,400	3,629	3,622	3,748
		Diesel	7,774	8,168	8,276	8,789
	Wastewater		2,114	1,970	1,805	2,036
Scope 3 Upstream and Downstream Emissions to Supplement In- boundary emissions (metric tons/yr)	Electricity		258	238	272	275
	Transportation Fuels	YNP-PTW	903	922	919	944
		Visitors (bus) WTW	949	790	953	924
		Visitors (non- bus rec) WTW	44,136	48,483	50,185	50,718
		Commuting- cars WTW	5,106	5,106	5,106	5,106
		Commuting- buses WTW	228	258	157	151
	Stationary Fuels	Propane	530	565	564	584
		Diesel	1,943	2,042	2,069	2,197
	Solid Waste	Landfill	7,877	8,300	6,775	3,405
		Compost	--	--	200	474
	Cement		275	275	275	275
	Food		38,020	38,324	38,327	38,795
	Scope 1 and 2 Total			25,309	25,858	25,424
Scope 3 Total			100,224	105,303	105,847	103,848
TOTAL (metric tons/yr)			125,533	131,161	131,271	129,990
Visitors			3,431,514	3,737,472	3,901,408	3,951,393
TOTAL GHG per visitor (kg CO <sub>2</sub> e/visitor)			36.58	35.09	33.65	32.90
<sup>a</sup> Notes: YNP = Yosemite National Park; WTP = Well-to-Pump emissions; PTW = Pump-to-Wheel emissions; WTW = Well-to-Wheel emissions or life cycle emissions, which is also the sum of WTP and PTW SOURCE: Villalba <i>et al</i> 2012a.						



A summary of 2008 through 2011 energy consumption within Yosemite Valley is shown in **table 9-156**.

**TABLE 9-156: ENERGY CONSUMPTION TOTALS USED IN THE GHG EMISSIONS INVENTORY 2008-2011**

Source		Total Consumption			
		Year 2008	Year 2009	Year 2010	Year 2011
Electricity (Gigawatt -hours)		23.63	22.00	23.19	22.62
Transportation Fuels	YNP (gallons)	462,500	486,913	471,259	512,985
Stationary Fuels	Propane (gallons)	583,818	623,123	622,049	643,625
	Diesel (gallons)	761,206	799,838	810,438	643,625
SOURCE: Villalba et al 2012b					

As is evident from the table, stationary sources (e.g., lighting, heating) within Yosemite Valley consume electricity, fuel oil and propane. NPS and Delaware North Companies Parks and Resorts at Yosemite (DNC) mobile sources (e.g., motor vehicles) consume gasoline and diesel fuel, and the majority of visitor vehicles operate on gasoline. It should be noted that energy consumption in Yosemite Valley varies from year to year. Measures taken by the park and the park concessioner to reduce energy consumption and GHG emissions include: (1) purchase of 18 hybrid electric-diesel shuttle buses that provide free transit to 2.5 million park visitors within the Valley annually (NPS 2005c), (2) installation of high-efficiency heating and cooling systems in employee housing (NPS 2007g), use of reclaimed water for irrigation (NPS 2008g), and installation at the El Portal Administrative Site of the largest solar energy system in the national park system (NPS 2011q), among other actions.

### ***Environmental Consequences Methodology***

Changes in energy consumption in the Merced River corridor are qualitatively evaluated by assessing changes in housing, park and concessioner facilities, camping, and vehicle fuel use. The climate change analysis evaluates both whether and how each alternative could contribute to climate change. Although there is a broad consensus in the scientific community that human activities are contributing to global warming, there is limited guidance available on how to properly analyze the impact of local development projects with respect to climate change. This is particularly true where the project is unlikely to result in large changes in local or regional emissions. This evaluation considers changes in the amount of energy consumed and related levels of direct and indirect GHG emissions, the alteration of land uses that sequester GHGs, and changes in land uses.

- **Context.** Any change in energy consumption and GHG emissions in the Merced River corridor would be negligible at a statewide and global scale. However, the contribution of each alternative will be evaluated.
- **Intensity.** The intensity of the impact considers whether the impact would be negligible, minor, moderate, or major. Negligible impacts would not be detectable and would have no discernible effect on the amount of energy consumed or the amount of GHG emissions (assumed to be 1% or less of threshold) generated. Minor impacts would be slightly detectable but would not be expected to have an overall effect on those conditions. For GHG emissions, minor impacts are assumed to occur up to 50% of the applicable threshold. Moderate impacts

would be clearly detectable and could have an appreciable effect on energy use or GHG emissions (assumed to occur at emission levels greater than 50% but less than the applicable threshold). Major impacts would have a substantial, highly noticeable influence on and could permanently alter those conditions. For GHG emissions, major impacts are assumed to occur when emissions exceed the applicable threshold.

For this analysis, the EPA Mandatory Reporting Rule level of 25,000 metric tons of CO<sub>2</sub>e per year is used to identify a major source of GHGs.

- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration and would be associated with transitional types of activities. A long-term impact would have a long-lasting or permanent effect on energy use, emissions, or land use.
- **Type of Impact.** Impacts are evaluated for whether they would be beneficial or adverse in terms of energy consumption and climate change. Beneficial impacts would reduce energy consumption, reduce emissions, or change land uses to those that would reduce emissions. Adverse impacts would increase energy consumption, increase emissions, or change land uses to those that would make it more difficult to reduce emissions.

### *Environmental Consequences of Alternative 1 (No Action)*

#### **Impacts Common to Segments 1–8**

Alternative 1 (No Action) assumes a continuation of existing regulations and management practices that govern energy consumption and climate change into the foreseeable future. No new structures would be constructed in the Merced River corridor, except for minor structures that are small temporary, easily removed, and not habitable; designed to support existing uses, systems, and programs; located within the existing building footprint; and not created solely for commercial purposes. Temporary housing for employees displaced by the 2008 rockfall would continue as needed at Huff House, Lost Arrow, Yosemite Lodge, Ahwahnee concessioner employee housing area, Boys Town, and El Portal Trailer Village, and for NatureBridge students at Curry Village. Housing for NPS employees and park partner staff would remain at current levels and locations.

Recent efforts by the park and primary park concessioner to reduce overall energy consumption and GHG emissions include purchasing 18 hybrid electric-diesel shuttle buses; replacing existing park vehicles with alternative-fuel and hybrid vehicles; implementing additional recycling and composting measures; using reclaimed water for irrigation; as well as installing energy-efficient appliances and lighting and passive heating and cooling systems in employee housing, solar panels on park housing units, and the largest solar energy system in the national park system (at the El Portal Administrative Site).

#### **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

Under Alternative 1 (No Action), energy use and emissions in the areas of Segments 1, 5, 6, and 8 would remain similar to those under Alternative 1. No new buildings or facilities would be constructed as part of Alternative 1, so no substantial new sources of energy consumption or emissions would be

introduced. Although park visitation would be expected to increase at a rate of approximately 3% annually, Segments 1, 5, 6, and 8 do not have transportation facilities and are relatively inaccessible, so visitor use in these areas would not likely increase at the same rate as the more developed areas of the park. Alternative 1 would therefore result in a long-term, negligible, and adverse impact with respect to energy and GHG conditions along Segments 1, 5, 6, and 8.

**Segments 1, 5, 6, & 8 Impact Summary.** Implementation of Alternative 1 would result in segmentwide, long-term, negligible, and adverse impacts with respect to energy and GHG conditions along Segments 1, 5, 6, and 8.

### **Segments 2, 3, 4, and 7: Yosemite Valley, Merced River Gorge, El Portal, and Wawona (Nonwilderness)**

Under Alternative 1, it is expected that visitation levels would increase primarily during the current nonpeak periods (i.e., the months on either side of the peak summer months and on weekdays during peak summer months). If this were to occur, then traffic congestion and associated GHG emissions during nonpeak periods could approximate current peak-period levels. Visitation could also increase during peak periods and, to the degree that such increases were to happen, traffic congestion and GHG emissions would marginally worsen. Mobile emissions sources would continue to include automobiles, trucks, and buses and would remain subject to state and federal emissions control standards and programs (including statewide Pavley and Low Carbon Fuel Standards), which are expected to lead to a decrease in GHG emissions in the foreseeable future. Because mobile sources from visitors are the primary source of non-fire related GHGs at the park (according to the latest inventory), and visitation is projected to increase over time, GHG emissions would be expected to increase in the future although at a reduced rate because of regulations governing mobile-source GHGs. Thus, increased traffic and traffic congestion under Alternative 1 would result in a long-term, minor, adverse impact with respect to energy consumption and GHG emissions.

Emissions sources would continue to include energy consumption at existing NPS and concessioner facilities in the Merced River corridor, regular maintenance activities, and campfires. Most of these sources would continue in the same manner and extent as under existing conditions, though some could decrease as a result of sustainability measures and others would increase in relative proportion to visitor-use levels. Daily, routine, and intermittent operational maintenance intended to stabilize and protect park facilities, address visitor health and safety issues, and protect natural and cultural resources would continue as under existing conditions. This includes campground maintenance, road and trail maintenance, building and grounds maintenance, and utility system repair and maintenance throughout Segments 1–8. However, alternative-fuel or hybrid park vehicles would reduce GHG emissions associated with these activities. In addition, energy-efficiency upgrades and green building designs that have been and are currently being implemented by the NPS would continue to reduce energy consumption and associated GHG emissions under Alternative 1. Campfire usage could increase in proportion to the increased visitation, especially during nonpeak periods. Thus, GHG emissions would be expected to increase in the future in rough proportion to the increased usage of campfires under Alternative 1. Overall for these sources, the continuation of NPS climate action plan strategies under Alternative 1 would result in a long-term, moderate, beneficial impact with respect to energy consumption and GHG emissions.

**Segments 1, 5, 6, & 8 Impact Summary.** Implementation of Alternative 1 would result in long-term, moderate beneficial impacts associated with the continuation of NPS climate-action-plan sustainability strategies for Segments 2, 3, 4, and 7; however, because mobile sources generate the vast majority of all GHGs in the park, and visitation is projected to increase, Alternative 1 would result in an overall long-term, minor, adverse impact related to energy and GHGs.

### **Cumulative Impacts for Alternative 1 (No Action)**

The discussion of cumulative impacts related to energy consumption and climate change is based on analysis of past, present, and reasonably foreseeable future actions in the Merced River corridor, in combination with the potential effects of Alternative 1. Past actions have generally resulted in the construction of new facilities to accommodate additional visitors and employees.

#### ***Past Actions***

Past actions have had both adverse and beneficial impacts related to energy and climate change. Temporary constructions activities associated with the majority of past projects listed in Appendix B had short-term adverse effects on energy and climate change (i.e., from fuel usage and GHG emissions related to equipment and motor vehicle exhaust). However, most of these projects have had either no net adverse effects or beneficial effects on current or future energy and climate change conditions. The following past projects had long-term, minor, beneficial impacts on energy and climate change conditions, which would continue under Alternatives 2–6.

The **Yosemite Area Regional Transportation System (YARTS)** was established in 2000 to provide an alternative to private vehicles accessing the park. YARTS was intended to expand the range of travel options for visitors to Yosemite Valley and to other primary park destinations, and for employees commuting to work in the park. It also provides a means for visitors to travel to Yosemite Valley when restricted-access measures are implemented for private vehicles during times of severe congestion. YARTS has had a long-term, beneficial effect by reducing the number of day visitors arriving in private vehicles.

**Housing Projects** (i.e., Curry Village Employee Housing, Curry Village Huff House Temporary Housing, Yosemite Valley Lost Arrow Temporary Employee Housing, and Yosemite Valley Ahwahnee Temporary Employee Housing) involved the construction of housing and related facilities to accommodate concessioner employees. The housing units replaced concessioner housing lost in the January 1997 flood and the rockfall events at Curry Village in October 2008 and were developed in consultation with litigants as part of a settlement agreement concerning the *Merced Wild and Scenic River Comprehensive Management Plan*. These actions provided temporary lodging for concessioner employees, and were needed to help meet immediate short-term housing needs for the park concessioner until permanent employee housing became available. Construction was completed from 2007 to 2009.

**Yosemite Valley Shuttle Bus Stop Improvements** consisted of the preparation of preliminary design plans, environmental compliance documents, and construction drawings; the construction of six 10-foot by 80-foot concrete braking pads; the rehabilitation or replacement of 94,000 square feet of asphalt road approaches; and the construction of bus stop shelters. Construction was completed in 2010. These improvements support shuttle bus service in Yosemite Valley, resulting in a segmentwide, long-term, minor, beneficial impact.

**Hybrid Electric-Diesel Shuttle Bus Procurement** consisted of the purchase of diesel hybrid transit buses by the NPS. Hybrid bus operations result in long-term benefits to fuel usage and GHG emissions in comparison to diesel-only buses.

The **replacement of existing park service vehicles** with alternative fueled or hybrid vehicles has also reduced GHGs.

Installation of the **solar array and rehabilitation of existing facilities** has resulted in sustainable energy generation and reduced energy consumption.

**Habitat Restoration Projects** (i.e., Cook's Meadow Ecological Restoration, DNC Yosemite Valley Ecological Restoration, Fern Springs Restoration, Happy Isles Fen Habitat Restoration, Merced River Ecological Restoration at Eagle Creek, and Red Peak Pass Trail Rehabilitation) included revegetation of affected areas, which resulted in long-term, beneficial effects resulting from CO<sub>2</sub> sequestration.

### ***Present Actions***

Present projects that could have a corridorwide, long-term, beneficial, cumulative effect on energy and climate change include:

- *2004 Fire Management Plan/EIS*
- The following projects, which would individually, and in combination, encourage travel to the park by alternative (nonprivate vehicle) modes, and would manage traffic and parking to reduce congestion and associated fuel usage and GHG emissions:
  - Increased YARTS services
  - Changeable electronic signs in Mariposa, Midpines, and El Portal, alerting drivers to traffic conditions in Yosemite Valley
  - Computer-Aided Dispatch / Automatic Vehicle Locator
  - Software design and purchase to process raw data from vehicle counters to produce useful information for visitors on parking and traffic conditions

Restricted access measures will continue to control the volume of incoming vehicles when traffic and parking conditions in Yosemite Valley are over congested. The YARTS will continue to reduce the number of individual vehicles operated within the park.

Present projects listed immediately below could have a short-term, adverse effect from construction but a long-term, beneficial, cumulative effect on energy and climate change.

- The following transportation projects, could increase atmospheric carbon sequestration within affected areas:
  - Fuels Reductions/Forest Rehabilitation
  - General Ecological Restoration
  - *Vegetation Management Plan*

- The following transportation projects could improve transportation circulation and thereby reduce fuel usage and GHG emissions:
  - South Park Intelligent Transportation System: electronic signs and groundhog automatic vehicle counters at entrance stations and parking lots to know when parking lots are full
  - Parking alternative option at the El Portal Maintenance Facility
  - Parkwide Communication Data Network infrastructure upgrade
- The following energy-related projects could improve facility efficiency and sustainability:
  - *Ahwahnee Comprehensive Rehabilitation Plan*
  - Crane Flat Utilities
  - *East Yosemite Valley Utilities Improvement Plan/EA*

Present projects that could have a short-term adverse effect on energy and climate change include all projects not mentioned above that include some temporary construction activities. There would be no net long-term, adverse or beneficial impacts on energy and climate change from these projects.

#### ***Reasonably Foreseeable Future Actions***

Similar to past actions, reasonably foreseeable future actions would result in both adverse and beneficial energy and climate change impacts. Reasonably foreseeable future projects that could have a long-term, beneficial, cumulative impact related to energy and climate change include the Transit Passenger Information System.

Other beneficial impacts for reasonably foreseeable future actions are similar to those discussed for past and present actions (i.e., the restricted access measures and increased YARTS services). Reducing traffic congestion and encouraging travel to the park by alternative (nonprivate vehicle) modes would have segmentwide, long-term, beneficial impacts on energy and climate change.

Reasonably foreseeable future actions that could have a short-term adverse effect on energy and climate change include all projects that would involve some temporary construction activities. There would be no net long-term, adverse or beneficial impacts on energy and climate change from these projects.

#### ***Overall Cumulative Impact***

Because Alternative 1 would not involve substantial construction projects, it would not be expected to contribute to construction-related GHG impacts. Continued management of traffic, encouragement of alternative forms of transportation, and energy conservation measures would have long-term, beneficial energy and GHG impacts.

There would be long-term, beneficial impacts associated with the continuation of NPS climate-action-plan sustainability strategies. However, because mobile sources generate the substantial majority of all GHGs in the park, and visitation is projected to increase, Alternative 1 would result in an overall long-term, minor, adverse energy and GHG impact.

## ***Environmental Consequences of Actions Common to Alternatives 2–6***

### **Impacts Common to Segments 1–8**

Changes to energy consumption in the Merced River corridor are qualitatively evaluated by assessing changes in housing, park and concessioner facilities, camping, and vehicle fuel usage. The climate change analysis evaluates both whether and how each alternative might contribute to climate change, which could include GHGs generated by short-term construction (i.e., equipment and on-road vehicle exhaust) and long-term operations (i.e., on-road vehicle exhaust, natural gas combustion, campfires, vegetation [sequestration] removal or restoration, and indirect sources from electricity generation).

### ***Impacts of Actions to Protect and Enhance River Values***

In general, the impacts of actions to protect and enhance river values would be associated with short-term construction activities, such as demolition, removal of trees, infrastructure, roads, habitat restoration, or trail development, which would require fuel consumption and would result in temporary emissions of GHGs. Overall construction activities associated with actions to protect and enhance river values would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap. Over the long-term, tree removal would reduce sequestration, whereas habitat restoration would increase sequestration. However, sequestration changes would be negligible overall.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur across all segments under Alternatives 2-6 include removing 3,400 feet of riprap from the river bank and revegetating with riparian species, and replacing an additional 2,300 feet of riprap with bioengineered riverbank stabilization devices. This work would require the use of heavy equipment, including loaders and dump trucks. The removal, transport, disposal, restoration, and monitoring work associated with these actions would require several weeks of park staff time to implement, but would not substantially disrupt other ongoing construction, demolition, and restoration activities in the Valley and beyond. As a result, these actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

In general, the Impacts of Actions to Manage User Capacity, Land Use, and Facilities stem from short-term construction activities requiring fuel consumption and therefore temporary emissions of GHGs. Overall construction activities associated with actions to manage visitor use and facilities would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

Long-term impacts of these actions would primarily be associated with on-road vehicles (visitors and employees) and area pollution sources. Mobile sources would include automobiles, trucks, and buses and would remain subject to regulations governing mobile source GHG controls (including statewide Pavley and Low Carbon Fuel Standards), which are expected to lead to a continuing decrease in emissions per VMT for the foreseeable future. Since visitor on-road vehicular sources are the primary

generator of GHG emissions in the park, the increase or decrease in visitor capacity and VMT would have the greatest impact on total GHGs.

GHG emissions sources would continue to include energy consumption at NPS and concessioner facilities located in the Merced River corridor, regular maintenance activities, and campfires. Actions that would reduce housing, campsites, or lodging would result in a proportional reduction in area source emissions, including emissions from maintenance/landscaping, natural gas combustion for heating/cooling, and campfires. Daily, routine, and intermittent operational maintenance would continue, including campground maintenance, road and trail maintenance, buildings and grounds maintenance, and utility system repair and maintenance throughout the park. However, alternative fuel or hybrid park vehicles would reduce the GHG emissions associated with these activities. In addition, energy-efficient upgrades and green building designs that have been and are currently being implemented by the NPS would continue to reduce energy consumption and associated GHG emissions under Alternatives 2–6. Overall for these sources, the continuation of NPS climate action plan strategies would result in a long-term, moderate, beneficial energy and GHG impact.

Impacts of specific projects are described below for each river segment where appropriate.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Actions to protect and enhance river values that would occur in Yosemite Valley under Alternatives 2–6 involve removal of abandoned infrastructure and other development affecting the Merced River’s hydrologic function, extensive meadow restoration, and management of high visitor-use areas to address associated impacts on riparian habitats and sensitive cultural resources. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, removal, transport, disposal, restoration, and monitoring work associated with these actions would require more than one year of crew and equipment time. As a result, these actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 2 under Alternatives 2–6 include: restoring 4.5 acres of riparian habitat in the area of Yosemite Lodge and 20 acres in the area of the Former Upper Pines Loop Campground; restoring impacted areas of Ahwahnee Meadow, including through removal of tennis courts; improving access and removing infrastructure from riparian areas at Cathedral Beach, Housekeeping Camp, and Bridalveil; constructing a boardwalk extension to reduce Sentinel Meadow trampling; removing one and formalizing five other traffic pullouts along El Portal Road; and fencing and vegetation management at Stoneman Meadow, restoring floodplain habitat at Devil’s Elbow, and filling ditches not serving current operational needs. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, removal, transport, disposal, restoration, and monitoring work associated with these actions would require more than one year of park staff time to implement. As a result, these actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.



**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternatives 2-6 include: placing constructed logjams in the channel between Clarks and Sentinel Bridges; and removing the abandoned gauging station at Pohono Bridge, removing the footings and former river gauge base at Happy Isles, and restoring these areas to natural conditions. This work would involve the use of heavy equipment, including excavators, a skid steer, and dump trucks, and require approximately more than 17 weeks of crew and equipment time to implement. As a result, these actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

**Cultural Resource Actions.** Specific projects to protect and enhance the river's cultural values that would occur within Segment 2 under Alternatives 2-6 include rehabilitation of informal trails and parking in the vicinity rock art and rock shelters in the area of Bridalveil Falls, fencing and/or restricting access to the archeologically significant large bedrock mortar (pounding rock) next to Yosemite Falls Trail, restoration of impacted portions of Ahwahnee Meadow, and removal of abandoned infrastructure from the Bridalveil sewer plant to enhance oak recruitment. With the exception of abandoned infrastructure removal, the majority of this work would be completed through the use of hand tools and require a nominal commitment of staff time. As such, the impact on GHG emissions and energy consumption would be short-term, negligible, and adverse.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values that would occur within Segment 2 under Alternatives 2-6 include: selectively thinning conifers and other vegetation in the vicinities of The Ahwahnee and Meadow, Bridalveil Falls and West Valley, Cooks and Sentinel Meadows, Curry Village, El Capitan, Housekeeping Camp, Yosemite Lodge, and other areas of the Valley; restoring grassland and oak habitat in the areas of Bridalveil Straight; repairing riverbank erosion at Clark's Bridge; and addressing informal trails and trampling at the east end of El Capitan Meadow. Much of this work would be accomplished through the use of hand tools, but could also involve heavy equipment for various handling, transport, and restoration activities. This work would occur over the course of several years. As a result, these actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Actions to manage visitor use and facilities within Segment 2 that would occur under Alternatives 2-6 involve substantial changes to campsites, visitor and administrative facilities, employee housing, and transportation. The construction, demolition, transport, and disposal activities associated with this work would contribute to a short-term, regional and local, moderate, adverse impact on air quality, even after implementation of Mitigation Measure AQ-MM-2 (see Appendix C). As such, the impact on GHG emissions and energy consumption would be short-term, minor, and adverse, as vehicle traffic and visitation would be reduced as a result.

**Curry Village and Campgrounds.** The park would remove the Happy Isles Snack Stand at Curry Village. At The Ahwahnee, the park would remove the swimming pool and tennis courts; redesign, formalize, and improve drainage within the existing parking lot; and construct a new 50 parking space lot east of the current parking area. This work would require the use of heavy equipment, including excavators and skid steers. As such, the impact on GHG emissions and energy consumption would be short-term, negligible, and adverse.

**Camp 6 and Yosemite Village.** The park would remove from Yosemite Village the Concessioner General Office, Concessioner Garage, and the Arts and Activities Center (Bank Building), and repurpose the Village Sports Shop for public use. It would also construct a new maintenance building near the Government Utility Building. This work would require the use of heavy equipment, including excavators and skid steers. As such, the impact on GHG emissions and energy consumption would be short-term, negligible to minor, and adverse.

**West Yosemite Valley.** The park would remove the NPS Volunteer Office, post office, swimming pool, and snack stand. It would also remove old and temporary employee housing (Thousands Cabins and Highland Court) and replace it with new housing. This work would require the use of heavy equipment, including excavators and skid steers. As such, the impact on GHG emissions and energy consumption would be short-term, negligible to minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 2. Actions to manage user capacities, land use, and facilities would have short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 2. However, these actions would not be expected to have a long-term impact.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

To protect and enhance river values within the Merced River gorge and El Portal, the park would remove informal trails, nonessential roads, fill materials, and abandoned infrastructure throughout Segments 3 and 4. The demolition, removal, transport, and disposal of waste materials; and restoration of these areas would have a short-term, negligible to minor, and adverse impact on GHG emissions and energy consumption.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 4 under Alternatives 2-6 include removing development, asphalt and imported fill from the Abbieville and Trailer Village areas. The project would require the use of a skid steer and dump truck, and take several weeks to complete. Accordingly, the impact on GHG emissions and energy consumption would be short-term, negligible, and adverse.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic resource values include restoring the Greenemeyer Sand Pit to natural conditions. The work would require the use of heavy equipment over a period of several weeks. Accordingly, the impact on GHG and energy consumption would be short-term, negligible, and adverse.

**Scenic Resource Actions.** Specific projects to protect and enhance the river's scenic values that would occur within Segment 3 under Alternatives 2-6 include: selectively thinning conifers in the area of the Cascade Falls viewpoint. Much of this work would be accomplished through the use of hand tools, but could also involve heavy equipment for various handling, transport, and restoration activities. This

work would occur over the course of a few days. Accordingly, the impact on GHG emissions and energy consumption would be short-term, negligible, and adverse.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Under each alternative, the park would construct infill housing in El Portal Village Center. The park would also construct a restroom for visitor use in Old El Portal. The work would require the use of heavy equipment throughout the construction process. As such, the projects would have a short-term, negligible to minor, adverse impact on GHG emissions and energy consumption. Over the long-term, occupation of the new residential units would contribute to a negligible, adverse impact.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segments 3 & 4. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have short-term and long-term, negligible to minor, adverse impacts on energy and GHG conditions within Segments 3 & 4.

#### **Segments 6 and 7: Wawona and Wawona Impoundment**

##### ***Impacts of Actions to Protect and Enhance River Values***

The park would improve Wawona Campground wastewater and refuse management and facilities, remove abandoned infrastructure, and undertake numerous site-specific management measures to counteract or minimize ongoing impacts on cultural resources. These actions would have a short-term, negligible, adverse impact on GHG emissions and energy consumption.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic values that would occur within Segment 7 under Alternatives 2-6 include developing a waste water collection system, including the construction of a pump station above the Wawona Campground. This work would require the use of heavy equipment, including an excavator, skid steer, loader, and dump truck. This effort would require approximately one month of crew time to complete. Accordingly, the impact on GHG emissions and energy consumption would be short-term, negligible, and adverse.

**Cultural Resource Actions.** Specific projects to protect and enhance the river's cultural values that would occur within Segment 7 under Alternatives 2-6 include removing and relocating campsites that cause potential impacts to sensitive archeological resources. This work could require the use of heavy equipment, including an excavator, skid steer, loader, and dump truck. This effort would require approximately one week to complete. Accordingly, the impact on GHG emissions and energy consumption would be short-term, negligible, and adverse. Over the long-term, reduced campsites would result in reduced campfires, which would be a negligible, beneficial impact.

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

To improve operational efficiency, the park would construct new facilities to house maintenance operations and a new wildland fire station within Segment 7. The park would also remove staged

materials, abandoned utilities, vehicles, and a parking lot from the riparian buffer at the Wawona Maintenance Yard and restore the area's native ecosystem, and remove roadside parking between the Wawona Store and Chilnualna Falls Road. The construction and restoration activities associated with these projects would involve the use of heavy equipment and occur over a period of several months. The resulting impact on Segment 7 GHG emissions and energy consumption would be short-term, negligible to minor, and adverse.

**Wawona.** The park would redesign the bus stop at the Wawona Store to accommodate increased visitor use. This project would be carried out primarily through the use of hand and small power tools. The resulting energy and GHG impact would be short-term, negligible, and adverse.

**Segment 7 Impact Summary:** With implementation of mitigation measure MM-AIR-2 (see Appendix C), as applicable, actions to protect and enhance river values would result in local, short-term, negligible, adverse impacts on energy and GHG conditions within Segment 7. Actions to manage user capacities, land use, and facilities would have short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 7. However, these actions would not be expected to have a long-term impact.

### **Summary of Impacts Common to Alternatives 2–6**

Alternatives 2–6 would result in energy consumption and GHG emissions associated with short-term construction and long-term operational activities. Overall, more energy consumption and greater emissions of GHGs would occur in nonwilderness portions of the Merced River corridor to a much greater extent than wilderness portions. Stationary sources would continue to be regulated under the applicable air district rules and regulations, some area sources would continue to be subject to park regulations, and mobile sources would continue to be subject to state and federal emissions standards.

### ***Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 2 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to protect and enhance river values would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Impacts associated with implementation of Alternative 2 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to manage visitor use and facilities would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

With regard to long-term impacts associated with visitor capacity under Alternative 2, on-road mobile emissions were quantified using the California Air Resources Board's emission's factors model (EMFAC2007) and compared with the Federal Mandatory Reporting Rule threshold of 25,000 metric tons of CO<sub>2</sub>e per year. Although bus operations are projected to increase under Alternative 2, the reduction in total daily visitor and administrative use and capacity would result in a long-term, minor, beneficial impact owing to reduced on-road vehicles in the park, as depicted in the **table 9-157** below.

**TABLE 9-157: ON-ROAD VEHICLE GHG EMISSIONS (METRIC TONS/YEAR)<sup>a</sup>**

Scenario	CO <sub>2</sub> e
Alternative 2 Emissions	38,278
Alternative 1 (No Action) Emissions	49,619
Incremental Change <sup>b</sup>	(11,341)
Federal Mandatory Reporting Rule Threshold	25,000
Impact Intensity, Type? <sup>c</sup>	Minor, Beneficial
<sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in the Alternatives chapter were totaled for each alternative to determine the regional GHG emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G. <sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions. <sup>c</sup> Negligible impacts would not be detectable and would have no discernible effect on GHG emissions (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on GHG emissions (assumed to occur when emissions exceed applicable threshold).	

### **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

#### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

Under Alternative 2, long-term energy use and emissions in the areas of Segments 1, 5, 6, and 8 would remain similar to those under Alternative 1 (No Action). No new buildings and facilities would be constructed within Segments 1, 5, 6, and 8 as part of Alternative 2, so no substantial new sources of energy consumption or emissions would be introduced. Overnight visitation and total daily use levels would be 26% and 33% less, respectively, than under Alternative 1. With fewer on-road vehicles in the vicinity under Alternative 2, the overall effect on energy consumption and GHGs along Segments 1, 5, 6, and 8 would be long-term, minor, and beneficial.

**Merced Lake High Sierra Camp.** The park would close the Merced Lake High Sierra Camp and remove all associated infrastructure, convert the area to designated Wilderness, and expand dispersed camping at Merced Lake Backpackers Camping Area into the former High Sierra Camp footprint. Closure of the camp would temporarily increase energy consumption and GHG emissions associated

with facilities removal and restoration. The short-term impact would be negligible and adverse. Over the long-term, these actions would reduce the amount of energy (and associated emissions) required to stock, operate, and maintain the facility. The resulting impact would be long-term, negligible to minor, and beneficial.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segments 1, 5, 6, & 8.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 2 under Alternative 2 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing development, asphalt, and fill material, and restoring 35.6 acres of floodplain at the former Upper and Lower River campgrounds; removing campsites and infrastructure from the 100-year floodplain and restoring an additional 25.1 acres of floodplain and riparian habitat; and removing informal trails and informal parking at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require approximately 65 weeks of crew and equipment time over a period of three years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river’s hydrologic and geologic values that would occur within Segment 2 under Alternative 2 include: relocating unimproved Camp 6 parking and rerouting a portion of Northside Drive; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time. As a result, these actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6. Reduced housing or lodging would result in a proportional reduction in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion

for heating/cooling) and facility energy usage. Since campsites would be reduced along this segment (estimated at 450 versus 466 for Alternative 1), there would also be a proportional reduction in campfire GHG emissions. With fewer on-road vehicles and potential area sources under Alternative 2, the overall effect on energy consumption and GHGs would be long-term, minor, and beneficial.

**Curry Village and Campground.** The park would construct 78 new hard-sided units in Boys Town, bringing the total number of new and retained units at Curry Village to 433. The park would remove campsites from lower Pines (32), North Pines (86), and Upper Pines (24). Several of these actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting short-term GHG impact would be negligible and adverse.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible to minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would convert the Highland Court area to a walk-in campground; reconfigure pedestrian crossing of Northside Drive and Yosemite Lodge Drive, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These actions would also require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 2. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segment 2.

## **Segments 3 and 4: Merced River Gorge and El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2–6.

With fewer on-road vehicles under Alternative 2, the overall effect on energy consumption and related GHG emissions would be long term, minor, and beneficial. Increased housing would result in a

proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage, which would have a long-term, minor, and adverse impact.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segments 3 & 4. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor beneficial impacts on energy and GHG conditions within Segments 3 & 4.

### **Segment 7: Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 7 under Alternative 2 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. The resulting impact from construction on GHG emissions and energy consumption would be short-term, negligible, and adverse.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to service facilities would be similar to those described above for the analysis common to Alternatives 2–6.

The removal of the golf course for ecological restoration and the removal of the Wawona stables would have a beneficial effect. Energy consumption and GHGs associated with these facilities (such as maintenance/landscaping and natural gas combustion for heating/cooling) would be reduced, which would result in a long-term, negligible to minor, beneficial impact.

**Wawona Campground.** Under Alternative 2, the park would reduce the size of the Wawona Campground. Thirty-two campsites, or 33% of all campsites within Wawona, would be removed from the floodplain. There would be a proportional reduction in campfire GHG emissions, which would have a long-term, negligible, beneficial impact. This would result in a long-term, negligible, beneficial impact on GHG emissions and energy consumption.

**Segment 7 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible, adverse impacts on energy and GHG conditions within Segment 7. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have short- and long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segment 7.



## **Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

Impacts associated with implementation of Alternative 2 would be similar to those described above for the analysis common to Alternatives 2–6. Construction would result in short-term, negligible to minor, adverse impacts. For long-term operations, the overall reduction in accommodations (housing, campsites, and/or lodging) would result in a proportional reduction in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling), in campfire GHG emissions, and in facility energy usage. In addition, reducing the overall visitor capacity and implementation of mitigation measure MM-AIR-2 (see Appendix C) as applicable, Alternative 2 would result in a long-term, minor, beneficial energy and climate change impact.

## **Cumulative Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following cumulative energy and climate change analysis are the same as those identified for Alternative 1.

### ***Overall Cumulative Impact from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

Because management actions under Alternative 2 and actions common to Alternatives 2-6 involve substantial construction activity, their associated equipment and on-road vehicle fuel usage and GHG emissions would be expected to result in short-term, negligible to minor adverse energy and climate change impacts. However, with reduced daytime and nighttime visitor capacity, Alternative 2 management actions would also result in a long-term, cumulatively beneficial energy and climate change impact from reduced VMT and facility energy usage. In addition, the continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, would have long-term, beneficial energy and climate change impacts.

## ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 3 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to protect and enhance river values would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Impacts associated with implementation of Alternative 3 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to manage visitor use and facilities would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

With regard to long-term impacts associated with visitor capacity under Alternative 3, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared with the Federal Mandatory Reporting Rule threshold of 25,000 metric tons of CO<sub>2</sub>e per year. Although bus operations are projected to increase under Alternative 3, the reduction in total daily visitor and administrative use and capacity would result in a long-term, minor, beneficial impact owing to reduced on-road vehicles in the park, as depicted in the **table 9-158** below.

**TABLE 9-158: ON-ROAD VEHICLE GHG EMISSIONS (METRIC TONS/YEAR)<sup>a</sup>**

Scenario	CO <sub>2</sub> e
Alternative 3 Emissions	37,286
Alternative 1 (No Action) Emissions	49,619
Incremental Change <sup>b</sup>	(12,333)
Federal Mandatory Reporting Rule Threshold	25,000
Impact Intensity, Type? <sup>c</sup>	Minor, Beneficial
<p><sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in the Alternatives chapter were totaled for each alternative to determine the regional GHG emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G.</p> <p><sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions.</p> <p><sup>c</sup> Negligible impacts would not be detectable and would have no discernible effect on GHG emissions (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on GHG emissions (assumed to occur when emissions exceed applicable threshold).</p>	

**Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment*****Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

Under Alternative 3, long-term energy use and emissions in the areas of Segments 1, 5, 6, and 8 would remain similar to those under Alternative 1 (No Action). No new buildings and facilities would be constructed within Segments 1, 5, 6, and 8 as part of Alternative 3, so no substantial new sources of energy consumption or emissions would be introduced. With fewer on-road vehicles in the vicinity,

the overall effect on energy consumption and GHGs along Segments 1, 5, 6, and 8 would be long term, minor, and beneficial.

**Merced Lake High Sierra Camp.** The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and use the former camp area for a temporary stock camp. Closure of the camp would temporarily increase energy consumption and GHG emissions associated with facilities removal and restoration. The short-term impact would be negligible and adverse. Over the long-term, these actions would reduce the amount of energy (and associated emissions) required to stock, operate, and maintain the facility. The resulting impact would be long-term, negligible to minor, and beneficial.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segments 1, 5, 6, & 8.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 3 include: rerouting trails at Ahwahnee Meadows; removing and restoring a portion of Northside Drive (900 feet) and rerouting the bike path; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing development, asphalt, and fill material, and restoring 35.6 acres of floodplain at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 150 feet of the river and restoring an additional 12 acres of floodplain and riparian habitat; and removing informal trails and installing signage and fencing to redirect visitor traffic at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require approximately 50 weeks of crew and equipment time over a period of two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 3 include: relocating unimproved Camp 6 parking; removing the Stoneman, Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time over a period of two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6.

Overnight visitation and total daily use levels would be 23% and 37% less, respectively, than under Alternative 1. Reduced housing or lodging would result in a proportional reduction in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) in facility energy usage. Since campsites would be increased along this segment (estimated at 477 versus 466 for Alternative 1), there would also be a proportional increase in campfires, which would result in a long-term, negligible, adverse impact for GHG emissions. However, with fewer on-road vehicles and potential area sources under Alternative 3, the overall effect on energy consumption and GHGs would be long term, minor, and beneficial.

**Curry Village and Campground.** The park would retain 355 guest units at Curry Village. The park would remove campsites from lower Pines (15), North Pines (34), and Upper Pines (2). Several of these actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting short-term GHG impact would be negligible and adverse. The reduction in units would decrease energy demand, resulting in a long-term, negligible, beneficial impact.

**Camp 6 and Yosemite Village.** The park would reroute Northside Drive to the south of the Yosemite Village day-use parking area, reconfigure the lot to accommodate a total of 550 parking spaces north of the road, and install walkways leading to Yosemite Village. These actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible to minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would move on-grade pedestrian crossing to west of the Northside Drive and Yosemite Lodge Drive, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These actions would also require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 2. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would similarly have long-term negligible to minor, beneficial impacts on energy and GHG conditions within Segment 2.

## Segments 3 and 4: Merced River Gorge and El Portal

### *Impacts of Actions to Protect and Enhance River Values*

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Short-term construction activities and impacts associated with changes to camping and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2–6.

With fewer on-road vehicles under Alternative 3, the overall effect on energy consumption and related GHG emissions would be long term, minor, and beneficial.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segments 3 & 4. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have short-term and long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segments 3 & 4.

## Segment 7: Wawona

### *Impacts of Actions to Protect and Enhance River Values*

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. The resulting impact from construction on GHG emissions and energy consumption would be short-term, negligible, and adverse.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Short-term construction activities and impacts associated with changes to service facilities would be similar to those described above for the analysis common to Alternatives 2–6. The removal of the golf course for ecological restoration would have a beneficial effect. Energy consumption and GHGs associated with this facility (such as maintenance/landscaping and natural gas combustion for heating/cooling) would be reduced, which would have a long-term, negligible to minor, beneficial impact.

**Wawona Campground.** Under Alternative 3, the park would reduce the size of the Wawona Campground. Twenty seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. There would also be a proportional reduction in campfire GHG emissions. This would result in a long-term, negligible, beneficial impact on GHG emissions and energy consumption.

**Segment 7 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible, adverse impacts on energy and GHG conditions within Segment 7. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have short- and long-term, negligible, beneficial impacts on energy and GHG conditions within Segment 7.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Impacts associated with implementation of Alternative 3 would be similar to those described above for the analysis common to Alternatives 2–6. Construction would result in short-term, negligible to minor, adverse impacts. For long-term operations, reduced housing and lodging would result in a proportional reduction in area GHG emissions sources, such as maintenance/landscaping, natural gas combustion for heating/cooling, and facility energy usage. In addition, reducing the overall visitor capacity and implementation of mitigation measure MM-AIR-2 (see Appendix C) as applicable, Alternative 3 would result in a long-term, minor to moderate, beneficial energy and climate change impact.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following cumulative energy and climate change analysis are the same as those identified for Alternative 1.

### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

Because management actions under Alternative 3 and actions common to Alternatives 2–6 involve substantial construction activity, their associated equipment and on-road vehicle fuel usage and GHG emissions would be expected to result in short-term, negligible to minor adverse energy and climate change impacts. However, with reduced daytime and nighttime visitor capacity, Alternative 3 management actions would also result in a long-term, cumulatively beneficial energy and climate change impact from reduced VMT and facility energy usage. In addition, the continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, would have long-term, beneficial energy and climate change impacts.

### ***Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration***

#### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 4 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to protect and

enhance river values would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Impacts associated with implementation of Alternative 4 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to manage visitor use and facilities would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

With regard to long-term impacts associated with visitor capacity under Alternative 4, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared with the Federal Mandatory Reporting Rule threshold of 25,000 metric tons of CO<sub>2</sub>e per year. Although bus operations are projected to increase under Alternative 4, the reduction in total daily visitor and administrative use and capacity would result in a long-term, minor, beneficial impact owing to reduced on-road vehicles in the park, as depicted in the **table 9-159** below.

**TABLE 9-159: ON-ROAD VEHICLE GHG EMISSIONS (METRIC TONS/YEAR)<sup>a</sup>**

Scenario	CO <sub>2</sub> e
Alternative 4 Emissions	43,045
Alternative 1 (No Action) Emissions	49,619
Incremental Change <sup>b</sup>	(6,574)
Federal Mandatory Reporting Rule Threshold	25,000
Impact Intensity, Type? <sup>c</sup>	Minor, Beneficial
<sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in the Alternatives chapter were totaled for each alternative to determine the regional GHG emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G. <sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions. <sup>c</sup> Negligible impacts would not be detectable and would have no discernible effect on GHG emissions (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on GHG emissions (assumed to occur when emissions exceed applicable threshold).	

**Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

Under Alternative 4, long-term energy use and emissions in the areas of Segments 1, 5, 6, and 8 would remain similar to those under Alternative 1 (No Action). No new buildings and facilities would be constructed within these segments as part of Alternative 4, so no substantial new sources of energy consumption or emissions would be introduced. With fewer on-road vehicles in the vicinity under Alternative 4, the overall effect on energy consumption and GHGs along Segments 1, 5, 6, and 8 would be long term, minor, and beneficial.

**Merced Lake High Sierra Camp.** The park would close the Merced Lake High Sierra Camp and removal all infrastructure, convert the area to designated Wilderness, and restoration of the former camp area to natural conditions. Closure of the camp would temporarily increase energy consumption and GHG emissions associated with facilities removal and restoration. The short-term impact would be negligible and adverse. Over the long-term, these actions would reduce the amount of energy (and associated emissions) required to stock, operate, and maintain the facility. The resulting impact would be long-term, negligible to minor, and beneficial.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segments 1, 5, 6, & 8.

## **Segment 2: Yosemite Valley**

### *Impacts of Actions to Protect and Enhance River Values*

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternative 4 include: removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; removing 1,335 feet of Southside Drive, re-alignment of the road, reconfiguring Curry Orchard parking lot, and extending the Stoneman Meadow boardwalk; removing asphalt and fill material, restoring topography of 19.7 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 150 feet of the river and restoring an additional 12 acres of floodplain and riparian habitat; and erecting fencing, signage, and boardwalks to redirect visitor traffic, and removing informal trails at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 35 weeks of crew and equipment time over a period of at least two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 4 include: relocating unimproved Camp 6 parking; placing large wood and constructed logjams along the base of Stoneman Bridge; removing the Ahwahnee and Sugar Pine Bridges; and restoring these areas to natural



conditions. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 30 weeks of crew and equipment time over a period of two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6.

Overnight visitation and total daily use levels would be 7% greater and 19% less, respectively, than under Alternative 1. Since campsites would be increased along this segment (estimated at 701 versus 466 for Alternative 1), there would also be a proportional increase in campfire GHG emissions, which would be a long-term, negligible to minor, adverse impact. Reduced housing or lodging would result in a proportional reduction in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage. Overall, with fewer on-road vehicles and potential area sources under Alternative 4, the effect on energy consumption and GHGs would be long term, minor, and beneficial.

**Curry Village and Campground.** The park would retain 355 guest units and construct a new 40 site campground at Curry Village. The park would remove campsites from lower Pines (15), North Pines (34), and Upper Pines (2). Several of these actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting short-term GHG impact would be negligible and adverse. The reduction in units would decrease energy demand, resulting in a long-term, negligible, beneficial impact.

**Camp 6 and Yosemite Village.** The park would improve the configuration of and on-grade pedestrian crossing at the Northside Drive-Yosemite Village Drive intersection, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 750 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible to minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 150 automobiles and 15 tour busses. These actions would also require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 2. However, these actions would not be expected to have a long-term impact. Actions to manage user

capacities, land use, and facilities would similarly have long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to parking and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2–6.

With fewer on-road vehicles under Alternative 4, the overall effect on energy consumption and related GHG emissions would be long term, minor, and beneficial. Increased housing would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage, which would have a long term, minor, and adverse impact.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segments 3 & 4. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term and long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segments 3 & 4.

### **Segment 7: Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 4 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. The resulting impact from construction on GHG emissions and energy consumption would be short-term, negligible, and adverse.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Wawona Campground.** Under Alternative 4, the park would reduce the size of the Wawona Campground. Twenty-seven campsites, or 28% of all campsites within Wawona, would be removed from the floodplain. There would be a proportional reduction in campfire GHG emissions. This would result in a long-term, negligible, beneficial impact on GHG emissions and energy consumption.

**Segment 7 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible, adverse impacts on energy and GHG conditions within Segment 7. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible, beneficial impacts on energy and GHG conditions within Segment 7.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Impacts associated with implementation of Alternative 4 would be similar to those described above for the analysis common to Alternatives 2–6. Construction would result in short-term, negligible to minor, adverse impacts. For long-term operations, reduced housing and lodging would result in a proportional reduction in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage. In addition, reducing the overall visitor capacity and implementation of mitigation measure MM-AIR-2 (see Appendix C) as applicable, Alternative 4 would result in a long-term, minor, beneficial energy and climate change impact from reduced fuel usage and GHG emissions associated with on-road vehicles. An increased number of overall campsites could result in a greater number of campfires, which would result in a long-term, negligible to minor, adverse impact on GHG emissions.

### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following cumulative energy and climate change analysis are the same as those identified for Alternative 1.

### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

Because management actions under Alternative 4 and actions common to Alternatives 2–6 involve substantial construction activity, their associated equipment and on-road vehicle fuel usage and GHG emissions would be expected to result in short-term, negligible to minor adverse energy and climate change impacts. With reduced overall daily visitor capacity, Alternative 4 would result in a long-term, cumulatively beneficial energy and climate change impact from reduced VMT and associated fuel usage and GHG emissions. However, an increased number of campsites could result in an adverse impact from increased campfire usage and associated GHG emissions. The continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, would have long-term, beneficial energy and climate change impacts.

## ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 5 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to protect and enhance river values would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Impacts associated with implementation of Alternative 5 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to manage visitor use and facilities would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

With regard to long-term impacts associated with the visitor capacity under Alternative 5, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared to the Federal Mandatory Reporting Rule threshold of 25,000 metric tons of CO<sub>2</sub>e per year. Although bus operations are projected to increase under Alternative 5, the reduction in total daily visitor and administrative use and capacity would result in a long-term, minor, beneficial impact owing to reduced on-road vehicles in the park, as depicted in the **table 9-160** below.

**TABLE 9-160: ON-ROAD VEHICLE GHG EMISSIONS (METRIC TONS/YEAR)<sup>a</sup>**

Scenario	CO <sub>2</sub> e
Alternative 5 Emissions	48,082
Alternative 1 (No Action) Emissions	49,619
Incremental Change <sup>b</sup>	(1,537)
Federal Mandatory Reporting Rule Threshold	25,000
Impact Intensity, Type? <sup>c</sup>	Minor, Beneficial
<sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in the Alternatives chapter were totaled for each alternative to determine the regional GHG emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G. <sup>b</sup> Values in (parentheses) are net reductions with respect to Alternative 1 (No Action) emissions. <sup>c</sup> Negligible impacts would not be detectable and would have no discernible effect on GHG emissions (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on GHG emissions (assumed to occur when emissions exceed applicable threshold).	

## **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

Under Alternative 5, long-term energy use and emissions in the areas of Segments 1, 5, 6, and 8 would remain similar to those under Alternative 1 (No Action). No new buildings and facilities would be constructed within these segments as part of Alternative 5, so no substantial new sources of energy consumption or emissions would be introduced. With fewer on-road vehicles in the vicinity under Alternative 5, the overall effect on energy consumption and GHGs along Segments 1, 5, 6, and 8 would be long term, minor, and beneficial.

**Merced Lake High Sierra Camp.** The park would reduce the capacity of the Merced Lake High Sierra Camp to 42 beds and replace the flush toilets with composting toilets. Facilities replacement would temporarily increase energy consumption and GHG emissions associated with moving equipment and supplies by helicopter. The short-term impact would be negligible and adverse. Over the long-term, capacity changes would reduce the amount of energy (and associated emissions) required to stock, operate, and maintain the facility. The resulting impact would be long-term, negligible, and beneficial.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have long-term, negligible, beneficial impacts on energy and GHG conditions within Segments 1, 5, 6, & 8

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 2 under Alternatives 5 include: removing asphalt and fill material, restoring topography of 35.6 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 100 feet of the river and restoring an additional 6.5 acres of floodplain and riparian habitat; removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows; installing culverts beneath Northside Drive; reconfiguring the Curry Orchard parking lot;; removing informal trails and erecting fencing, signage, and boardwalks to reduce visitor impacts, and selectively remove conifers to improve views redirect visitor traffic at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 40 weeks of crew and

equipment time over a period of two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 5 include: relocating unimproved Camp 6 parking; removing the Sugar Pine Bridge; placing large wood and constructed logjams along the base of Stoneman Bridge; and improving trail connectivity and routing in the vicinity of the Ahwahnee Bridge. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require at least 16 weeks of crew and equipment time over a period of two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

### *Impacts of Actions to Manage User Capacity, Land Use, and Facilities*

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6.

Overnight visitation and total daily use levels would be 16% greater and 5% less, respectively, than under Alternative 1. Since campsites would be increased along this segment (estimated at 640 sites versus 466 sites for Alternative 1), there would also be a proportional increase in campfire GHG emissions, which would have a long-term, negligible to minor, adverse impact. With fewer on-road vehicles under Alternative 5, energy consumption and related GHG emissions would be long term, minor, and beneficial. Increased lodging would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage, which would be a long term, minor, and adverse impact.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from lower Pines (5), North Pines (14), and Upper Pines (2). Several of these actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting short-term GHG impact would be negligible and adverse.

**Camp 6 and Yosemite Village.** The park would construct a pedestrian underpass and a traffic circle at the intersection of Northside and Yosemite Village Drives, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible to minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. These actions would also require the use of heavy construction equipment and would

increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 2.

However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible to minor, beneficial impacts on energy and GHG conditions within Segment 2.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to parking and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2–6.

With fewer on-road vehicles under Alternative 5, the overall effect on energy consumption and related GHG emissions would be long term, minor, and beneficial. Increased housing would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage, which would have a long-term, minor, and adverse impact.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segments 3 & 4. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible, beneficial impacts on energy and GHG conditions within Segments 3 & 4.

### **Segment 7: Wawona**

#### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur within Segment 7 under Alternative 3 include the relocation of stock use campsites from sensitive resource areas to the Wawona Maintenance Yard. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. The resulting impact from construction on GHG emissions and energy consumption would be short-term, negligible, and adverse.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping facilities would be similar to those described above for the analysis common to Alternatives 2–6.

**Wawona Campground.** Under Alternative 5, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. There would be a proportional reduction in campfire GHG emissions. This would result in a long-term, negligible, beneficial impact on GHG emissions and energy consumption.

**Segment 7 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible, adverse impacts on energy and GHG conditions within Segment 7. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible, beneficial impacts on energy and GHG conditions within Segment 7.

**Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Impacts associated with implementation of Alternative 5 would be similar to those described above for the analysis common to Alternatives 2–6. Construction would result in short-term, negligible to minor, adverse effects. For long-term operations, increased housing, campsites, or lodging would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling), in campfire GHG emissions, and in facility energy usage, which would result in a long-term, minor, adverse impact. However, reducing the overall visitor capacity and implementation of mitigation measure MM-AIR-2 (see Appendix C) as applicable, Alternative 5 would result in a long-term, minor, beneficial energy and climate change impact from reduced fuel usage and GHG emissions associated with on-road vehicles.

**Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following cumulative energy and climate change analysis are the same as those identified for Alternative 1.

***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

Because management actions under Alternative 5 and actions common to Alternatives 2–6 involve substantial construction activity, their associated equipment and on-road vehicle fuel usage and GHG emissions would be expected to result in short-term, negligible to minor adverse energy and climate change impacts. With reduced overall visitor capacity, Alternative 5 would result in a long-term, cumulatively beneficial effect on energy and climate change from reduced VMT and associated fuel usage and GHG emissions. However, an increased number of lodging units and campsites would result



in an adverse impact from increased area source GHG emissions. The continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, would have long-term, beneficial energy and climate change impacts.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Impacts associated with implementation of Alternative 6 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to protect and enhance river values would likely result in short-term, negligible to minor, adverse GHG emissions and energy consumption, depending on the year-to-year development and activity overlap.

##### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Impacts associated with implementation of Alternative 6 would be similar to those described above for the analysis common to Alternatives 2–6. Overall construction activities associated with actions to manage visitor use and facilities would likely result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts, depending on the year-to-year development and activity overlap.

With regard to long-term impacts associated with the visitor capacity under Alternative 6, on-road mobile emissions were quantified using EMFAC2007 emission factors and compared to the Federal Mandatory Reporting Rule threshold of 25,000 metric tons of CO<sub>2</sub>e per year. As depicted in the **table 9-161**, below, the increase in total daily visitor and administrative use and capacity and bus operations would result in a long-term, minor, adverse impact owing to increased on-road vehicles in the park.

**TABLE 9-161: ON-ROAD VEHICLE GHG EMISSIONS (METRIC TONS/YEAR)<sup>a</sup>**

Scenario	CO <sub>2</sub> e
Alternative 6 Emissions	50,744
Alternative 1 (No Action) Emissions	49,619
Incremental Change	1,125
Federal Mandatory Reporting Rule Threshold	25,000
Impact Intensity, Type? <sup>c</sup>	Minor, Adverse
<p><sup>a</sup> Emissions were calculated using EMFAC2007 factors and assume 2.4 visitors per car with approximately 22 VMT per vehicle (calibrated based on annual VMT projected for Alternative 1 assuming 240 days/year peak and shoulder seasons) and bus trip VMT from <i>Supporting Information: A Life-Cycle Greenhouse Gas Inventory for Yosemite National Park</i> (Villalba et al 2012b). User capacities included in the Alternatives chapter were totaled for each alternative to determine the regional GHG emissions. Specific assumptions and emission factors incorporated into the calculations are included in Appendix G.</p> <p><sup>b</sup> Negligible impacts would not be detectable and would have no discernible effect on GHG emissions (assumed to be 1% or less of threshold). Minor impacts would be those that are present but not expected to have an overall effect on those conditions (assumed to occur up to 50% of applicable threshold). Moderate impacts are clearly detectable and could have an appreciable effect (assumed to occur at emissions levels greater than 50% but does not exceed the applicable threshold). Major impacts would have a substantial, highly noticeable influence on GHG emissions (assumed to occur when emissions exceed applicable threshold).</p>	

## **Segments 1, 5, 6, and 8: Merced River Above Nevada Fall, South Fork Merced River Above and Below Wawona, and Wawona Impoundment**

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

Under Alternative 6, long-term energy use and emissions in the areas of Segments 1, 5, 6, and 8 would remain similar to that of Alternative 1 (No Action). No new buildings and facilities would be constructed within segments 1, 5, 6, and 8 as part of Alternative 6, so no substantial new sources of energy consumption or emissions would be introduced. With a greater number of on-road vehicles in the vicinity under Alternative 6, the overall effect on energy consumption and GHGs along Segments 1, 5, 6, and 8 would be long term, minor, and adverse.

**Merced Lake High Sierra Camp.** The park would retain the Merced Lake High Sierra Camp and replace the flush toilets with composting toilets. Facilities replacement would temporarily increase energy consumption and GHG emissions associated with moving equipment and supplies by helicopter. The short-term impact would be negligible and adverse. Continued operation of the Camp would not be expected to change energy or GHG consumption from existing conditions. The resulting impact would be long-term, negligible, and adverse.

**Segments 1, 5, 6, & 8 Impact Summary:** Actions to manage user capacities, land use, and facilities would have long-term, negligible, adverse impacts on energy and GHG conditions within Segments 1, 5, 6, & 8

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 2 under Alternative 6 include: removing asphalt and fill material, restoring topography of 19.7 acres of floodplain, and installation of box culverts or other similar design components at the former Upper and Lower River campgrounds; removing campsites and infrastructure from within 100 feet of the river and restoring an additional 6.5 acres of floodplain and riparian habitat; removing fill and constructing a boardwalk over meadow and wet areas at Ahwahnee Meadows;; and removing informal trails, installing viewing platforms and boardwalks, and selectively remove conifers to improve views at El Capitan Meadow. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and restoration work would require at least 40weeks of crew and equipment time over a period of at least two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

**Hydrologic/Geologic Resource Actions.** Specific projects to protect and enhance the river's hydrologic and geologic values that would occur within Segment 2 under Alternative 6 include: relocating unimproved Camp 6 parking and placing large wood and constructed logjams along the bases of Stoneman, Sugar Pine, and Ahwahnee Bridges. This work would require the use of heavy equipment, including excavators, skid steers, loaders, and dump trucks. The demolition, transport, disposal, and revegetation activities associated with this work would require approximately 16 weeks of crew and equipment time over a period of two years. These actions would result in short-term, negligible to minor, adverse GHG emissions and energy-consumption impacts.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping, lodging, parking, circulation, employee housing, and service facilities would be similar to those described above for the analysis common to Alternatives 2–6.

Overnight visitation and total daily use levels would be 33% and 4% greater, respectively, than under Alternative 1. Since campsites would be increased along this segment (estimated at 739 sites versus 466 sites for Alternative 1), there would also be a proportional increase in campfire GHG emissions, which would have a long-term, negligible to minor, adverse impact. Reduced housing would result in a proportional reduction, while increased lodging would contribute to a proportional increase in area GHG emissions sources (such as maintenance/ landscaping, natural gas combustion for heating/cooling) and in facility energy usage. With a greater number of on-road vehicles and potential area sources under Alternative 6, the overall effect on energy consumption and GHGs would be long term, negligible to minor, and adverse.

**Curry Village and Campground.** The park would construct 98 hard-sided units at Boys Town, bringing the total number of new and retained units at Curry Village to 453. The park would remove campsites from lower Pines (5), North Pines (14), and Upper Pines (2). Several of these actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting short-term GHG impact would be negligible and adverse.

**Camp 6 and Yosemite Village.** The park would expand the Concessioner Warehouse Building to accommodate Concessioner General Office functions, construct a pedestrian underpass and two roundabouts, shift the parking area north and redevelop a portion of the former administrative footprint to accommodate 850 parking spaces, and install a new three-way intersection connecting the parking lot to Sentinel Drive. These actions would require the use of heavy construction equipment and would increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible to minor, and adverse.

**Camp 4 and Yosemite Lodge.** The park would design a pedestrian underpass, relocate the existing bus drop-off area to the Highland Court area to accommodate loading/unloading for three busses, and redevelop an area west of Yosemite Lodge to provide an additional parking for 300 automobiles and 15 tour busses. These actions would require the use of heavy construction equipment and would

increase construction-related emissions during project implementation. The resulting impact on GHG conditions would be short-term, negligible to minor, and adverse.

**Segment 2 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segment 2. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible, adverse impacts on energy and GHG conditions within Segment 2.

Segments 3 and 4: Merced River Gorge and El Portal

***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to parking and employee housing facilities would be similar to those described above for the analysis common to Alternatives 2–6.

With greater numbers of on-road vehicles under Alternative 6, the overall effect on energy consumption and related GHG emissions would be long term, negligible, and adverse. Increased housing would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling), in campfire GHG emissions, and in facility energy usage, which would have a long term, minor, and adverse impact.

**Segments 3 & 4 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible to minor, adverse impacts on energy and GHG conditions within Segments 3 & 4. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have short-term and long-term, negligible, adverse impacts on energy and GHG conditions within Segments 3 & 4.

**Segment 7: Wawona**

***Impacts of Actions to Protect and Enhance River Values***

Short-term construction activities and impacts would be similar to those described above for the analysis common to Alternatives 2–6.

**Biological Resource Actions.** Specific projects to protect and enhance the river’s biological values that would occur within Segment 7 under Alternative 6 include the relocation of stock use campsites from sensitive resource areas to Wawona Stables. This work could require the use of heavy equipment and would require approximately one week of crew and equipment time. The resulting impact from construction on GHG emissions and energy consumption would be short-term, negligible, and adverse.

### ***Impacts of Actions to Manage User Capacity, Land Use, and Facilities***

Short-term construction activities and impacts associated with changes to camping facilities would be similar to those described above for the analysis common to Alternatives 2–6.

**Wawona Campground.** Under Alternative 6, the park would reduce the size of the Wawona Campground. Thirteen campsites, or 13% of all campsites within Wawona, would be removed from the floodplain. There would be a proportional reduction in campfire GHG emissions. This would result in a long-term, negligible, beneficial impact on GHG emissions and energy consumption.

**Segment 7 Impact Summary:** Actions to protect and enhance river values would result in local, short-term, negligible, adverse impacts on energy and GHG conditions within Segment 7. However, these actions would not be expected to have a long-term impact. Actions to manage user capacities, land use, and facilities would have long-term, negligible, beneficial impacts on energy and GHG conditions within Segment 7.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Impacts associated with implementation of Alternative 6 would be similar to those described above for the analysis common to Alternatives 2–6. Construction would result in short-term, negligible to minor adverse effects. For long-term operations, increased housing, campsites, and lodging would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling), in campfire GHG emissions, and in facility energy usage. In addition, increasing the overall visitor capacity and implementation of mitigation measure MM-AIR-2, as applicable (see Appendix C), Alternative 6 would result in a long-term, minor, adverse energy and climate change impact from increased fuel usage and GHG emissions associated with on-road vehicles.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

The past, present, and reasonably foreseeable future actions in the Yosemite region considered for the following cumulative energy and climate change analysis are the same as those identified for Alternative 1.

### ***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

Because management actions under Alternative 6 and actions common to Alternatives 2–6 involve substantial construction activity, it would be expected to contribute to short-term, negligible to minor adverse energy and climate change impacts from equipment and on-road vehicle fuel usage and GHG emissions. With increased overall visitor capacity, Alternative 6 would result in a long-term, cumulatively adverse impact on energy and climate change from increased VMT and associated fuel usage and GHG emissions. An increased number of campsites would result in increased GHG

emissions from wood burning. Similarly, an increase in the number of lodging units would result in an adverse impact from increased area source GHG emissions and facility energy usage. The continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, would have long-term, negligible, beneficial energy and climate change impacts.

## Socioeconomics

### *Affected Environment*

This section evaluates the likely socioeconomic consequences of the specific management actions contained in each alternative and how the alternatives would affect the regional economy. As documented in the “Visitor Experience/Recreation” section of this chapter, there were an estimated 3.9 million annual visitors to Yosemite National Park in 2010 and 3.95 million in 2011, slightly fewer than the all-time record estimate of 4.0 million in 1996. Yosemite visitors spend millions of dollars on entrance fees, campgrounds, hotel lodging, meals, transportation, and other goods and services both inside the park and in gateway communities outside the park. As a result, visitor spending is an important source of income and employment for the park, the primary park concessioner, and the gateway communities. In addition, the National Park Service (NPS) operating budget pays employees and contractors to perform duties and provide services within the park, which, like visitor spending, provides revenue to support the economy of the surrounding region.

The “Socioeconomics” section contains two subsections: regional economy and visitor expenditures. The first section characterizes the regional economy. The region affected by the park includes the four surrounding counties: Madera, Mariposa, Mono, and Tuolumne. Economic and statistical profiles were developed for each county to assess the importance of tourism and NPS spending to the region. The profiles provide an economic baseline with detailed information on the size of each county’s principal economic sectors in terms of economic output, employment, and other relevant economic indicators. Although historical trends and future projections are included for some socioeconomic measures (e.g., population), the primary focus is on 2010, which has been selected as the most recent year for which reliable data are available to use as a baseline for the alternatives analysis to be conducted later in this EIS process.

The second section presents best estimates of baseline visitor spending. The NPS periodically surveys visitors to Yosemite and fortunately conducted a survey in 2009 as part of the Visitor Services Project (VSP). The results of this survey, as reported in the study, *Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009*, have been adjusted using the Consumer Price Index to estimate spending patterns for the baseline year of 2010.

### **Regional Economy**

The region evaluated in the socioeconomic analyses below includes all the gateway communities immediately adjacent to Yosemite National Park and the four counties that house them: Madera, Mariposa, Mono, and Tuolumne. This four-county region roughly coincides with the 50-mile radius for which spending was reported in the VSP survey. The four main access roads to the park pass through the four gateway counties; Highway 41 passes through Madera and Mariposa counties, Highway 140 passes through Mariposa County, Highway 120 east passes through Mono County, and Highway 120 west passes through Tuolumne County.

Yosemite National Park is located primarily in Mariposa and Tuolumne counties, with a small southern portion in Madera County. The developed areas along the main river corridor and the

South Fork Merced River, including Yosemite Valley, the El Portal Administrative Site, and Wawona are located within the jurisdiction of Mariposa County. Merced, Stanislaus, San Joaquin, and Fresno Counties were excluded from the affected region because, in these much more populous and urbanized counties, it is difficult to distinguish the portions of the tourist economies that are associated with Yosemite versus other tourist destinations. Also, tourism is a relatively small component of these counties' overall economies.

## Regional Comparison

### *Population*

In 2010 the population of the region of economic study was almost 240,000. **Table 9-162** shows the historical growth rates for this region during the past 40 years. The table also shows the state population and growth rates. The region containing the gateway communities to Yosemite National Park has been growing much more rapidly than the state of California as a whole, though it is important to note that this regional growth percentage is relative to the small baseline of four counties that are largely rural in character. Furthermore, while population at both geographic levels continues to grow, the rates of growth are slowing down.

**TABLE 9-162: HISTORICAL POPULATION BY COUNTY: 1970-2010**

County	1970	1980	1990	2000	2010
Madera	41,519	63,116	88,090	123,109	150,865
Mariposa	6,015	11,108	14,302	17,130	18,251
Mono	4,016	8,577	9,956	12,853	14,202
Tuolumne	22,169	33,928	48,456	54,504	55,368
Total 4-Co. Region	73,719	116,729	160,804	207,596	238,686
10-Year Growth		58%	38%	29%	15%
California	19,953,134	23,667,902	29,760,021	33,873,086	37,253,956
10-Year Growth		19%	26%	14%	10%
SOURCE: U.S. Bureau of the Census 2010]					

**Table 9-163** indicates that substantial growth is projected to continue into the future, both in the region of impact and in the state as a whole. The projections currently available from the California Department of Finance were made before the 2010 Census was available and before the full effects of the current recession were obvious. As a result, the actual 2010 population fell short of the predictions, and future populations are likely to be smaller by a similar proportion.

### Income

**Table 9-164** summarizes several key household demographic and income characteristics for the four-county study area. Incomes in all four of the counties are less than the average for California as a whole. Per-capita incomes are lowest in Madera County, though household sizes tend to be larger;



**TABLE 9-163: PROJECTED POPULATION BY COUNTY: 2000-2050**

County	2000	2010	2020	2030	2040	2050
Madera	124,696	162,114	212,874	273,456	344,455	413,569
Mariposa	17,150	19,108	21,743	23,981	26,169	28,091
Mono	13,013	14,833	18,080	22,894	29,099	36,081
Tuolumne	54,863	58,721	64,161	67,510	70,325	73,291
Total 4-Co. Region	209,722	254,776	316,858	387,841	470,048	551,032
10-Year Growth		21%	24%	22%	21%	17%
California	34,105,437	39,135,676	44,135,923	49,240,891	54,226,115	59,507,876
10-Year Growth		15%	13%	12%	10%	10%
SOURCE: California State Department of Finance 2011						

**TABLE 9-164: HOUSEHOLD INCOME CHARACTERISTICS FOR THE FOUR-COUNTY STUDY AREA**

Key Demographic Characteristics	Madera	Mariposa	Mono	Tuolumne	California
Persons per household, 2006–2010	3.30	2.28	2.61	2.28	2.89
Per-capita money income in past 12 months (2010 dollars)	\$18,724	\$27,064	\$27,321	\$25,483	\$29,188
Median household income 2006–2010	\$46,039	\$49,098	\$55,087	\$47,462	\$60,883
Persons below poverty level, percent, 2006–2010	19.3%	12.5%	12.0%	11.7%	13.7%
SOURCE: U.S. Census Bureau State & County QuickFacts 2010					

therefore, with more potential workers per household, household incomes in Madera are comparable to those in the neighboring counties. The poverty rate is also the highest in Madera County.

### *Employment*

Table 9-165 presents employment figures including all waged, salaried, and self-employed jobs in each county, and both full-time and part-time workers. In 2010 total employment was approximately 102,000 in the four-county area. Madera County, with the largest and most urbanized population, had the largest employment base in the region, accounting for approximately 57% of total employment. Mariposa County, which includes Yosemite Valley, El Portal, and Wawona, accounted for approximately 8% of total employment in the affected region. Table 9-165 provides total employment estimates for the counties by industry sector. The Service sector, which includes most of the businesses most directly impacted by tourism and visitor spending, accounts for 45% of the total region, and 59% of Mariposa County, which includes Yosemite Valley. The figures are used as the baseline for employment conditions.

According to the Local Area Unemployment Statistics program of the U.S. Bureau of Labor Statistics, in 2010 the total civilian labor force in the four-county region was 106,429, of which 90,509 were employed. The statewide unemployment rate in California at the time was 12.4%. Only Mariposa

**TABLE 9-165: 2010 EMPLOYMENT BY COUNTY AND MAJOR INDUSTRY SECTOR**

Industry Sector	Individual Counties				Total
	Madera	Mariposa	Mono	Tuolumne	Study Area
<b>Total</b>	<b>58,309</b>	<b>8,037</b>	<b>10,608</b>	<b>25,319</b>	<b>102,273</b>
Agriculture	12,701	294	105	519	13,619
Mining	88	79	24	118	310
Construction	2,258	478	687	1,692	5,115
Manufacturing	2,990	175	113	764	4,043
Transp. & Utilities	1,468	128	110	368	2,074
Trade	5,593	619	938	3,164	10,314
Service	21,816	4,755	6,493	12,905	45,970
Government	11,393	1,509	2,136	5,789	20,828
SOURCE: Minnesota IMPLAN Group, Inc. data; Land Economics Consultants analysis 2012					

County was slightly better off with an unemployment rate of 12.1%. The other three counties were between 14.0% and 15.6% (with the highest in the most populous county, Madera). The region's average unemployment rate in 2010 was 14.8%.

### *Economic Output*

Economic output is a measure of productivity. Measures of economic output vary, depending on the Industry sector. For the Agricultural and Trade sectors, output is measured by the value of products sold. In the Manufacturing sector, output is a measure of the value added by the manufacturer or the value of shipments. In the Service sector, output is measured as receipts in dollars. In 2010, the estimated total output of goods and services for the four-county region was approximately \$12.5 billion, as presented in **table 9-166**. Madera and Tuolumne counties, which are more urbanized with cities such as Madera and Sonora, produce the majority of the region's economic output. The almost entirely rural counties of Mariposa and Mono contributed only 16% of the output. However, 57% of Mariposa's output was generated in the tourism-heavy services sector.

### *Taxable Retail Sales*

Taxable retail sales are good indicators of annual spending in the Travel Service sectors because these sales represent taxes paid on transactions with consumers. The total taxable retail sales figures from the state Board of Equalization also include the taxes paid by businesses on raw materials and services. In 2010, the total taxable retail sales for the four counties in **table 9-167** were just over \$2.0 billion. The previous years' retail volumes have also been converted to constant 2010 dollars for comparison purposes. In real terms, retail sales were actually greater in 2001 at \$2.1 billion; grew at a healthy rate through 2006; and then declined with the recession, showing the most dramatic drops in 2008 and 2009. The data suggest that retail sales volumes have stabilized recently.

**TABLE 9-166: 2010 ECONOMIC OUTPUT BY COUNTY AND MAJOR INDUSTRY SECTOR (IN CONSTANT 2010 \$1,000,000s)**

Industry Sector	Individual Counties				Total
	Madera	Mariposa	Mono	Tuolumne	Study Area
Total	\$7,699	\$885	\$1,159	\$2,791	\$12,535
Agriculture	\$1,675	\$42	\$27	\$42	\$1,786
Mining	\$26	\$9	\$4	\$26	\$65
Construction	\$327	\$63	\$99	\$225	\$714
Manufacturing	\$1,201	\$39	\$47	\$170	\$1,456
Transp. & Utilities	\$337	\$38	\$20	\$133	\$527
Trade	\$499	\$52	\$70	\$238	\$858
Service	\$2,774	\$501	\$682	\$1,517	\$5,475
Government	\$861	\$142	\$210	\$441	\$1,654

SOURCE: Minnesota IMPLAN Group, Inc. data; Land Economics Consultants analysis 2010

**TABLE 9-167: TOTAL TAXABLE RETAIL SALES BY COUNTY (IN CONSTANT 2010 \$1,000,000s)**

County	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 <sup>a</sup>
Madera	\$1,063	\$1,110	\$1,194	\$1,299	\$1,464	\$1,550	\$1,512	\$1,344	\$1,119	\$1,159
Mariposa	\$160	\$160	\$161	\$179	\$190	\$182	\$175	\$173	\$163	\$164
Mono	\$248	\$263	\$267	\$292	\$307	\$322	\$281	\$259	\$205	\$215
Tuolumne	\$660	\$670	\$685	\$723	\$727	\$704	\$679	\$616	\$533	\$508
<b>Total 4-Co. Region</b>	<b>\$2,131</b>	<b>\$2,204</b>	<b>\$2,306</b>	<b>\$2,492</b>	<b>\$2,688</b>	<b>\$2,758</b>	<b>\$2,648</b>	<b>\$2,392</b>	<b>\$2,019</b>	<b>\$2,047</b>

<sup>a</sup> Annual total estimated by Land Economics Consultants from first three-quarters of data available.  
SOURCES: Calif. State Board of Equalization, Taxable Sales in California Annual Reports, Bureau of Labor Statistics (CPI-U)

## Madera County

According to the California Employment Development Department, almost a quarter of Madera County employment (23%) was on farms in 2010. When the Food Processing, Service, and Trade sectors of the economy are considered as well, agriculture's dominance in Madera County is obvious. The Leisure and Hospitality sector of the economy accounted for a little more than 6% of the jobs. Federal employment amounted to 300 jobs, or approximately 0.7% of county employment. In terms of fiscal resources, the transient occupancy tax only accounts for approximately 1% of Madera County's General Fund.

Madera County reaches from the crest of the Sierra Nevada range to the San Joaquin River on the Central Valley floor. The majority of the county's population and employment are concentrated along the Highway 99 corridor in the Central Valley. None of the developed parts of Yosemite National Park are in Madera County, but the county includes the headwaters of both the South Fork and the main stem of the Merced River in the high country at the southern end of the park. Because of its large

geographic size and diversity of the economy of Madera County, tourism associated with the park is not particularly important to the county as a whole. On the other hand, the eastern communities in the county, specifically Oakhurst and Bass Lake, are much more dependent on Yosemite tourism.

### **Mariposa County**

According to the Employment Development Department, tourism is Mariposa County's main industry and the area's largest employer, with more than a third (37%) of all jobs in the Leisure and Hospitality sector in 2010. The county's primary recreation area/tourist attraction is Yosemite National Park, much of which lies within the county, including the developed areas of Yosemite Valley, Wawona, and El Portal Administrative Site. Other major recreation areas in Mariposa County include Stanislaus National Forest and Sierra National Forest, as well as the U.S. Forest Service/Bureau of Land Management recreation areas along the Merced River. Other recreation resources in Mariposa County include Lake Don Pedro, Lake McSwain, and Lake McClure where camping is available.

Mariposa County's economy is very different than Madera County's. Less than 1% of Mariposa employment is on farms. In contrast, with the national park and forests, federal employment is much more important, accounting for approximately 800 jobs or 16% of county employment in 2010.

From a fiscal standpoint, Mariposa is the most dependent on tourism of the four counties. Almost a quarter of the \$42 million Mariposa County General Fund is derived from the Transient Occupancy Tax (TOT), or approximately \$10 million in the most recent fiscal year. The TOT is levied at the rate of 10% of the room rate and is collected from Bed and Breakfasts and transient rentals (e.g., Vacation Rentals by Owner), as well as from traditional hotels and motels. In addition, there is another 1% tax on transient rooms in the form of a Tourism Business Improvement District Assessment (TBID). All of the accommodations in Yosemite Valley, as well as those in Wawona, contribute to Mariposa's General Fund through the TOT and generate money for the TBID, as well.

Another way to look at it is Mariposa County collects 62% of the entire TOT generated within the four-county region.

### **Mono County**

Mono County is one of the least populated counties in California and is the gateway county for visitors entering through the eastern park entrance. Park access via this entrance is limited in the winter because the entrance is typically closed from November to late May as a result of snowfall. Lodging, food, beverage, and other services are central to Mono County's economy, which is also bolstered by extensive natural resources and recreational opportunities. As home to the Mammoth Mountain Ski Area, Mono County is a significant tourism destination in the winter. During summer, Mono County is a popular destination for such resort communities as Mammoth Lakes and June Lakes and for backcountry visitation to the John Muir and Ansel Adams Wilderness Areas.

According to Employment Development Department data for 2010, the Leisure and Hospitality sector accounted for almost half (49%) of all employment in Mono County. Federal employment constituted approximately 200 jobs or about 3% of all employment.

Mono County only collects about \$2 million per year in Transient Occupancy Taxes, but because it is such a small county, that amount constitutes 7% of the county's General Fund.

## **Tuolumne County**

The Tuolumne River watershed portion of Yosemite National Park is in the southeastern portion of Tuolumne County. The county also contains significant national forest lands and the Emigrant Wilderness, with recreation destinations scattered throughout. In addition to Yosemite, other recreational attractions in Tuolumne County include Columbia State Park, Stanislaus National Forest, Dodge Ridge Ski Area, and Pinecrest Lake.

The bulk of Tuolumne County's economy is clustered on private lands along Highways 49 and 108, as well as centered in the town of Sonora. The primary driver of the Tuolumne County economy is the service sector, which is indicative of a large retirement and second home based population in the surrounding Gold Country area of the foothills. According to the Employment Development Department, the Leisure and Hospitality sector accounted for about 12% of the jobs in Tuolumne County in 2010. Federal employment was approximately 400 jobs at that time, or about 3% of county jobs. The TOT in Tuolumne County generates about \$2 million per year, representing approximately 4% of the General Fund.

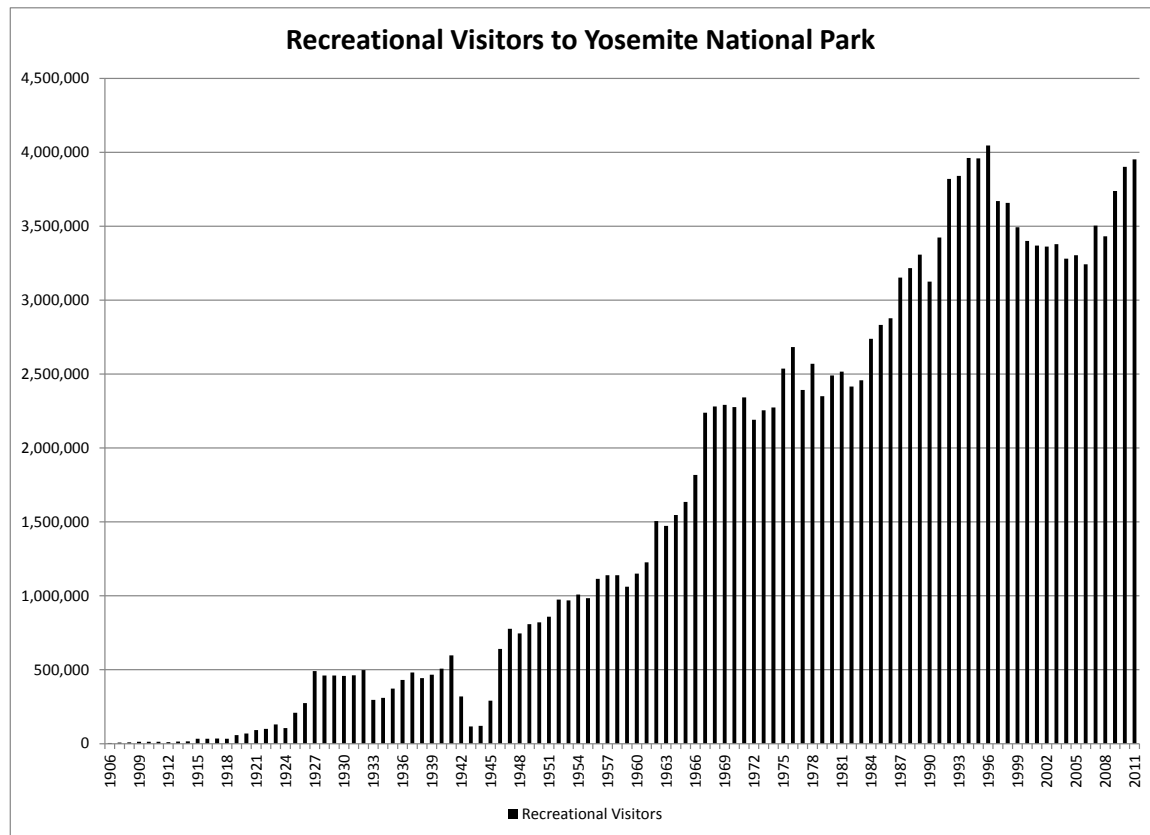
## **Trends in Visitation to the Park**

Socioeconomic impacts are highly correlated with overall visitation. **Figure 9-46** shows the trend in estimated total recreational visitation to Yosemite National Park over the last century. According to these estimates, visitation grew explosively at the beginning of the 20th century, only to crash along with the economy in the early 1930s. Then, growth began again, only to be halted by World War II. The post-war era showed strong, long-term growth, peaking in 1996. In 1987, when the Merced was designated a Wild and Scenic River, estimated visitation to the park stood at 3.2 million. The effects of the flood in early 1997, which dramatically reduced the inventory of overnight accommodations in Yosemite Valley, can be seen over the decade subsequent to 1997. The strong growth trend observed prior to 1997 can be seen again in recent years.

## **Visitor Expenditures**

### ***Average Visitor Expenditures***

The NPS's Visitor Services Project (VSP surveys) collected data in 2009 on expenditures of visitor groups inside the park and within 50 miles of the park. This data was analyzed in the February 2011 study, *Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009*. Spending averages in 2009 were computed per visitor group per day (or per night) for different market segments defined by the type and location of accommodations used. The observed 2009 spending averages were adjusted using the Consumer Price Index (CPI) to 2010 dollars, as presented in **table 9-168**. On a visitor group per day basis, average spending was \$75 for day trips by local residents, \$87 for day trips by nonlocal visitors, \$371 per night for visitors staying in park lodges or cabins, and \$170 per night for

**Figure 9-46**

Estimated Number of Recreational Visitors to Yosemite National Park

**TABLE 9-168: AVERAGE SPENDING PER DAY/NIGHT FOR VISITOR GROUPS IN 2010 DOLLARS**

Spending Category	Average Spending per Day/Night Visitor Groups in 2010 Dollars <sup>a</sup>						
	Local	Day Trip	Motel-in	Camp-in	Motel-out	Camp-out	Other Overnight
Motel, hotel, cabin, transient rental, or Bed & Breakfast	\$0.00	\$0.00	\$213.91	\$2.52	\$144.52	\$0.00	\$0.00
Camping fees	\$0.00	\$0.00	\$1.67	\$34.49	\$1.31	\$28.59	\$0.00
Restaurants & bars	\$21.99	\$17.04	\$61.09	\$23.18	\$49.04	\$24.46	\$12.12
Groceries & takeout food	\$18.98	\$10.98	\$18.61	\$20.98	\$17.08	\$16.07	\$4.55
Gas & oil	\$17.21	\$16.63	\$18.72	\$30.01	\$26.34	\$31.00	\$9.84
Local transportation	\$0.00	\$3.94	\$9.82	\$0.80	\$31.09	\$4.35	\$1.63
Admission & fees	\$11.71	\$23.68	\$25.35	\$38.26	\$22.51	\$12.94	\$5.79
Souvenirs & other expenses	\$4.74	\$14.43	\$22.02	\$19.79	\$21.07	\$13.40	\$3.61
<b>Total per Visitor Group</b>	<b>\$74.64</b>	<b>\$86.71</b>	<b>\$371.17</b>	<b>\$170.02</b>	<b>\$312.95</b>	<b>\$130.81</b>	<b>\$37.54</b>
<sup>a</sup> Adjusted from the 2009 Visitor Services Project survey results using the Consumer Price Index for All Urban Consumers, by industry category. SOURCE: Cook, Philip S., <i>Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009</i> , February, 2011[							

park campers. Visitors staying in motels, cabins, lodges, or bed and breakfasts (B&Bs) outside the park spent an average of \$313 per night during their trips and those camping outside the park spent \$131 per night. The “other overnight” column includes visitors staying in backcountry locations or with friends and relatives, and includes spending within the four-county area as visitors approach and leave the park.

The VSP Survey found that about 47% of visitor groups’ total spending is inside the park and 53% is outside the park. As one would expect, visitor groups staying overnight inside the park spent the majority of their money inside the park, and visitor groups staying outside the park spent most of their money in surrounding communities. A higher percentage of campers’ spending is on groceries, whereas visitor groups staying in lodges, cabins, and motels spend more on restaurant meals.

### ***Total Visitor Expenditures and Economic Impacts***

The total economic impact on the four-county study area from Yosemite National Park visitor spending and the NPS payroll in the baseline year of 2010 was recently calculated as part of an ongoing effort to estimate the economic benefits of national parks to their local communities (Stynes 2011). The summary statistics from this effort are presented in **table 9-169**. For the analysis of alternatives to follow, a model of the four-county economy has been constructed, and the impacts of visitor spending and the NPS payroll are analyzed using IMPLAN and the NPS Money Generation Model (MGM2), as described in the “Environmental Consequences Methodology” section, below. The model was calibrated using the published summary statistics in table 9-166 as control totals.

**TABLE 9-169: TOTAL SPENDING AND ECONOMIC IMPACTS:  
YOSEMITE NATIONAL PARK, 2010**

	Summary Statistics
<b>Public Use Data</b>	
2010 Recreation Visits	3,901,408
2010 Overnight Stays	1,720,909
<b>Visitor Spending 2010</b>	
All Visitors	\$354,689,000
Nonlocal Visitors	\$350,244,000
<b>Impacts of Nonlocal Visitor Spending</b>	
Jobs	4,602
Labor Income	\$132,465,000
Value Added	\$215,932,000
SOURCE: Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll</i> , 2010, December 2011	

## *Environmental Consequences Methodology*

### **Use of Established Regional Economic Analysis Models**

To quantitatively analyze the alternatives, including the Alternative 1 (No Action), a series of interlinked economic models has been developed that calculate economic impacts within the four-county region containing Yosemite National Park. The methodology for this EIS has been built in consultation with the ongoing providers of analyses of this type to the NPS. The central model for estimating economic impacts is the Money Generation Model 2 (MGM2) developed by Stynes et al. The three main inputs to the MGM2 version used here, and their sources, are

1. annual number of visitors to Yosemite broken down by lodging-based market segments, with a baseline calibrated using 2010 actual totals from NPS Public Use Data
2. spending averages for each lodging-based market segment from the Visitor Services Project, with the most recent survey data having been collected in 2009 and updated to 2010 dollars
3. economic multipliers generated by IMPLAN<sup>1</sup> from the four-county region for 2010

Data for the calendar year 2010 were used for development and calibration of a baseline set of models for this socioeconomic analysis. The year 2010 is the most recent for which IMPLAN multipliers are available. Fortunately, 2010 is also a U.S. Census year and at this time is the most recent year for which historical data are reliably available across a wide variety of socioeconomic measures. In 2010, the number of visitors to the park was approximately equal to the highest recorded numbers, with the previous record set in 1996 before the flood damage in early 1997. The goal of the baseline socioeconomic analysis was to create a series of operable economic models that can reproduce the results of ongoing economic impact estimation conducted for the NPS (as reported in the “Affected Environment” section, above). Having calibrated the operable set of models for the baseline year of 2010, the same models can be used to analyze the Alternative 1 as well as Alternatives 2–6 (the action alternatives) to produce results that can be reliably compared. In essence, the modeling of alternatives will be driven by the levels of annual visitation resulting from the management plans for each alternative as if each were in place today. Based on visitor spending patterns, the total level of economic activity generated in the region can be estimated. Visitor spending impacts are thus estimated in terms of 2010 dollars but for numbers of visitors appropriate to each alternative, compared to the number of visitors under Alternative 1 during the same time frame. Under the no action alternative it is expected that the number of people seeking to visit the park will continue to grow at approximately 3% per year over the next five years.

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<sup>1</sup> IMPLAN is a proprietary model (IMpact for PLANning) developed originally for the federal government in the 1980s at the University of Minnesota and now vended by MIG, Inc. (formerly the Minnesota IMPLAN Group, Inc.) to estimate the economic impacts of projects or policy changes on specific regions of study. Among other things, the model produces multipliers that facilitate the estimation of major economic impacts from input variables.



## **Economic Modeling Focuses on the Regional Level**

An economic impact analysis that involves IMPLAN modeling is typically concerned with the economic development potential of projects or management plans for a region. Thus, such an analysis typically ignores local spending transfers within the region and focuses only on new income that is derived from outside the region as the measure of “economic impact.” However, this analysis is interested in how alternative management plans might affect the use of the park by local residents of the gateway communities in the surrounding four counties. A less frequent but no less legitimate application of IMPLAN is to estimate total “economic activity,” which is a measure of total economic importance and which includes the economic activity stimulated by the spending of local residents associated with recreation in Yosemite. For the alternatives analyses in this EIS, spending by locals has been included so that changes in their recreation or spending patterns can be considered. Although spending by locals would not be included in a traditional economic impact analysis, the term “economic impact” (rather than “economic activity”) is used throughout this narrative to conform to the expectations of readers of NEPA analyses.

## **Two Primary Economic Drivers: Visitor Spending and NPS Spending**

The majority of the economic activity, including all the direct employment in concessioner-run facilities in the park, is driven by visitors. A minor portion of the economic activity is driven by the payroll and spending of the NPS itself, which will be estimated separately after the visitor-driven impact analysis.

Because socioeconomic analysis is concerned with matters such as job creation and business opportunities, an annual perspective is required (e.g., jobs are created by flows of money sufficient to support living wages and incomes; business viability depends on ongoing revenue potential, including off seasons as well as high seasons, etc.). The NPS’s MGM2 model is built to analyze economic impacts for an entire year of a park’s operation. Furthermore, for this analysis, a parkwide perspective, including all river segments, must be adopted in order to capture all visitor spending. The visitor spending data were collected for the entire park visit, including travel to and from the park, and included spending anywhere within the four-county host region for the park. For example, even visitors staying in backpacking camps in the wilderness depend on purchases made earlier, and visitors’ purchases of supplies in gateway communities, although modest, still contribute to the size of the four-county economy. For these reasons, an estimate of the annual, parkwide visits resulting from each alternative management plan is required as an input to the socioeconomic models.

## **Derivation of the Impact on Visitor Spending**

Table 9-170 presents a means of providing the future annual parkwide visitor estimate required for each alternative, based on the experience of the most recent calendar year, but considering the potential for future growth in demand for visits at approximately 3% per year, and differences in the supply of overnight accommodations and day use facilities in Yosemite Valley under the various management plans. In the analysis of transportation, the number of vehicles was tracked on a daily basis for 2011. Using a factor of 2.9 people per vehicle on the average, it was possible to estimate the number of visits to Yosemite Valley on each day in 2011. Under the No Action Alternative it was

**TABLE 9-170: ANNUAL PARKWIDE VISIT ESTIMATES FOR EACH ALTERNATIVE**

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Estimated Maximum Daily Visitation to the Valley	20,900	13,900	13,200	17,000	19,900	21,800
Number of Days Where Maximum Would Be Exceeded	0	87	91	68	10	1
Estimated Park-Wide Annual Visitation in 2011 <sup>a</sup>	3,951,393	3,951,393	3,951,393	3,951,393	3,951,393	4,192,033
Change from Park-Wide Annual Visitation (People)	0	(306,514)	(365,857)	(74,039)	(2,698)	(1,116)
<b>Estimated Park-Wide Visitation Achievable Within Maximums</b>	<b>3,951,393</b>	<b>3,644,879</b>	<b>3,585,536</b>	<b>3,877,354</b>	<b>3,948,695</b>	<b>4,190,917</b>
<sup>a</sup> 2011 Estimate from National Park Service Public Use Statistics Office for Alts 1 - 5. Alt 6 includes 2 years growth at 3%/year. SOURCE: Estimates by Land Economics Consultants 2012						

estimated the Valley was able to handle a maximum of 20,900 people in a day, which was consistent with a total estimated visitation in the park during 2011 of 3,951,000.

The different plans for infrastructure and facilities for each action alternative would result in a different maximum number of visitors that could be accommodated in the Valley. Under Alternatives 2 through 5, those maximums are smaller than the No Action Alternative, and for each alternative total parkwide visitation is projected to be less than what was observed in 2011 by the number of visitors that would have exceeded the daily maximums in the Valley. For example, for Alternative 3 a combined total of 366,000 visitors would have not been able to visit the Valley during 105 days that the maximum was exceeded. Total parkwide estimated visitation was thus reduced to a projected 3,586,000 for Alternative 3.

The proposed mix of infrastructure and facilities in Alternative 6 would allow for a higher maximum daily visitation to the Valley than under the No Action Alternative. In that case, visitation could continue to grow for two more years at the assumed rate of 3% per year before the same pattern of exceeding maximums on several peak days is experienced. After two years of growth, the maximum would be exceeded on three days, reducing visitation by 1,116, and resulting in an estimate for parkwide visitation at that point of approximately 4,191,000. These estimates on the bottom line of Table 9-113 will be used as inputs to the economic impact analysis of visitor spending in the sections to follow.

In reality, total annual visits to the park will most likely not decrease by as much as the estimates at the bottom of table 9-113 due to two effects commonly observed in economic market systems:

1. A “substitution effect” is possible during high-demand periods. That is, when people are unable to secure their first-choice lodging type, some will likely substitute a second-choice mode of visiting the park. For example, unable to get a reservation for concessioner lodging in the Valley, some people will likely opt for a motel in a gateway community and be repeat day visitors to the park during their stay.

2. A displacement or “time-shift effect” is possible, as well. Unable to secure reservations for their first-choice time period to visit the park, some people will likely change their plans to visit the park during a less popular period, but still contributing to the annual visitation numbers.

Although the extent of these human behaviors is unquantifiable at this time, it is highly likely that some combination of these and other mechanisms for economic adaptation will reduce the severity of adverse economic impacts, and it is possible that adverse impacts would be eliminated altogether. It is also possible that with continued growth in demand into the future, total parkwide annual visitation would continue to grow through these mechanisms, expanding into previously low-demand seasons and thereby continuing to increase visitor spending in the four-county economy. Economic expansion could also occur as Gateway business communities’ market alternative activities and destinations so that people stay in the area longer even though they are not spending the entire time in Yosemite.

To match visitor types with the visitor spending patterns quantified by the 2009 VSP Survey, other results from the visitor survey will be used below for each alternative to first apportion the total annual visits from Table 9-113 into lodging-based market segments and then to convert total number of visitors entering the park into visitor group nights (or days) by taking into account factors for:

- average visitor group size
- length of stay (days or nights)
- re-entry rate (park entries per trip)

The number of visitor group nights will then be multiplied by the spending patterns for each group, and the total impact on the four-county economy will be estimated for each alternative.

### **Derivation of the Impact on NPS Spending**

An additional source of economic expansion within the four-county area is direct NPS spending. Therefore, the impact of NPS employment and operations and maintenance spending must also be estimated for each alternative. **Table 9-171** presents a method for estimating the impact of each management plan on NPS employment and budget for employee compensation. This is a very simple extrapolation of data that correlates with present headcount, provided as an illustration of possible impacts of employee spending in the region. Starting with the estimation of annual visits, NPS employment is also assumed to vary with the annual volume of visitors parkwide. However, employment is subject to separation into fixed and variable costs. An analysis of the last five fiscal years of budgets for the park (2007 through 2011) has shown that 56% of the budget has come from “appropriated funds” and 44% from “revenue funds.” Given that the appropriated funds are relatively fixed, and that the term “revenue funds” implies that they fluctuate somewhat with the number of visitors, table 9-110 assumes that 56% of employment and compensation are fixed (i.e., would remain the same in all alternatives), and that 44% of NPS jobs would vary in proportion to the increase or decrease in visitor volumes.

In the long run, concessioner employment and operations and maintenance costs are funded by the revenues available to the concessioner, which are derived from visitor spending, and thus are already included in the analysis. In other words, the visitor spending profiles estimated total spending by each

**TABLE 9-171: NATIONAL PARK SERVICE DIRECT EMPLOYMENT AND BUDGET FOR EACH ALTERNATIVE**

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Estimated Parkwide Visits Considering Constraints	3,951,393	3,644,879	3,585,536	3,877,354	3,948,695	4,190,917
Difference from Alternative 1 (No Action)	100%	92%	91%	98%	100%	106%
Total National Park Service Direct Employment in 2010 (Jobs) <sup>1</sup>	892					
Portion of Jobs Assumed Fixed	56%					
Portion of Jobs Assumed to Vary With Visitor Volume	44%					
<b>Estimated Direct National Park Service Jobs for Each Alternative</b>	<b>892</b>	<b>862</b>	<b>856</b>	<b>885</b>	<b>892</b>	<b>916</b>
Total <b>National Park Service</b> Direct Employee Compensation (2010 \$1,000s) <sup>a</sup>	\$49,406					
Portion Assumed to be Fixed Cost	56%					
Portion Assumed to Vary with Visitor Volume	44%					
<b>Estimated Direct National Park Service Compensation for Each Alternative (2010 \$1,000s)</b>	<b>\$49,406</b>	<b>\$47,720</b>	<b>\$47,393</b>	<b>\$48,999</b>	<b>\$49,391</b>	<b>\$50,724</b>
<sup>a</sup> As reported in Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010</i> , Natural Resource Report NPS/NRSS/EQD/NRR--2011/481. SOURCE: Estimates by Land Economics Consultants 2012						

visitor group both inside and outside the park. For some visitors, spending on lodging supported hotel workers outside the park, for other visitors spending on lodging inside the park supported hotel workers employed by the concessioner.

It is assumed that park partner activities would remain the same under all alternatives.

### One-Time Impacts of NPS Spending on Restoration and Construction Projects

In addition to ongoing spending discussed above that will continue on, year after year, for “in-house” NPS staff and their activities, there is additional work performed every year by contractors on specific restoration projects, major road maintenance and other infrastructure projects, on environmental processing and planning, and for similar activities. The budgets for these activities vary significantly year by year as funding is identified for specific projects. Over the last five years (2007-2011) the total Yosemite National Park budget has ranged from \$70 to \$103 million, and has averaged \$89 million. After deducting the \$49 million in NPS staff costs discussed above, the average budget for contractor activities has been approximately \$40 million per year. The majority of contractor activity, estimated at 80%, is in the construction sector of the economy, with most of the remainder, estimated at 20%, in the professional services sector (e.g., architects, environmental planners, engineers, etc.) Thus, under

the No Action Alternative, approximately \$32 million per year is spent on construction sector projects, and \$8 million per year for the professional services to plan and design those projects.

In addition to the ongoing spending to maintain and repair the park, each action alternative essentially proposes a new plan for infrastructure and facilities that will guide future spending on projects, most of which will be carried out by contractors as described above. There will be one-time spending by NPS on the various project elements required to restore areas and construct facilities to implement each of the action alternatives. Although this spending will be spread out over a number of years during implementation as financial resources are identified, each project element will be built only once. The current estimates for the total implementation cost are as follows:

- Alternative 1 — There would be no additional costs for Alternative 1 (No Action)
- Alternative 2 — \$168,000,000
- Alternative 3 — \$147,000,000
- Alternative 4 — \$168,000,000
- Alternative 5 — \$183,000,000
- Alternative 6 — \$259,000,000

### Characterization of Impacts for NEPA

Proposed management actions under Alternative 1 and for Alternatives 2–6 will be evaluated in terms of the context, intensity, and duration of socioeconomic impacts and whether impacts were considered beneficial or adverse to the socioeconomic environment.

- **Context.** The context of the impact considers whether the impact would be local or regional. Unlike the analysis of most other topic areas, socioeconomics differs in that even “local” impacts are not confined to any one river segment. Although it is true that the largest concentration of commercial facilities within the park is in Yosemite Valley, visitors to the Valley may also make expenditures elsewhere within the region during their visits (e.g., stopping for gasoline in a gateway community). The indirect and induced effects quickly ripple away from the initial point of sale where the direct impact occurs, and total economic impacts are only measurable at the regional level. For purposes of this analysis, local impacts would be those that occur parkwide within Yosemite National Park. Regional impacts would be impacts in the four-county area around the park (Tuolumne, Mono, Mariposa, and Madera), including all gateway communities. Socioeconomic impacts will be discussed under the heading of “All River Segments.”
- **Intensity.** The intensity of the impact considers whether effects would be negligible, minor, moderate, or major.
  - **Negligible** impacts are considered not detectable and are expected to have no discernible effect on the social and economic environment. When the socioeconomic impacts are quantifiable, negligible impacts would generally be expected to correspond to proportional changes of 2.5% or less in the specific economic resource.
  - **Minor** impacts are slightly detectable and are not expected to have an overall effect on the character of the social and economic environment. When the socioeconomic

impacts are quantifiable, minor impacts would generally be expected to correspond to proportional changes between 2.5% and 5% in the specific economic resource.

- **Moderate** impacts are detectable, without question, and could have an appreciable effect on the social and economic environment. Such impacts would have the potential to initiate an increasing influence on the social and economic environment (particularly if other factors have a contributing effect). When the socioeconomic impacts are quantifiable, moderate impacts would generally be expected to correspond to proportional changes between 5% and 10% in the specific economic resource.
- **Major** impacts are considered to have a substantial, highly noticeable influence on the social and economic environment and could be expected to alter that environment over the long run. When the socioeconomic impacts are quantifiable, major impacts would generally be expected to correspond to proportional changes greater than 10% in the specific economic resource.

In addition, impacts are recognized as indeterminate if the intensity of their effects on the social and economic environment could not be readily identified (especially when compared with the potential influence of other social and economic factors and/or when data limitations exist).<sup>2</sup>

- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary and would be associated with transitional types of activities. A long-term impact would have an ongoing effect on the socioeconomic environment.
- **Type of Impact.** Impacts were evaluated in terms of whether they would be beneficial or adverse to the socioeconomic environment. Beneficial socioeconomic impacts would improve the social or economic conditions in the park or in the affected region. Beneficial impacts include mechanisms that attract additional visitors and spending into the region, create new jobs, or promote growth in the size of the regional economy. Adverse socioeconomic impacts would negatively alter social or economic conditions in the park or in the affected region, or would affect low-income populations. Adverse impacts include mechanisms that discourage some visitors from coming and spending money in the region, reductions in the number of jobs, or actions that retard the growth of the economy. Another, more specific, form of socioeconomic impact is the effect actions could have on the budgets of public agencies. Increases in revenues and reductions in costs are beneficial, and the inverse is adverse. Changes in economic activity levels can also stimulate changes in local housing markets. Increasing demand for housing due to economic expansion is generally seen as beneficial by housing providers, but adverse by low-income housing consumers.

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<sup>2</sup> The extent to which quantified socioeconomic analysis of the alternatives can be performed will depend directly on the degree to which: (1) the no-action alternative is quantitatively characterized; (2) alternatives are quantifiable distinct from the no-action alternative and amongst the action alternatives; and (3) that the action alternatives' effects on future park visitation can be adequately projected.

Differences in the magnitude of future annual visitation will be a potential primary factor resulting in quantifiable effects to local and regional socioeconomic resources. In addition, changes to the type of visitation (e.g., day use versus overnight use, length of stay, visitor activity type and/or location) or the visitor profile (e.g., age and income) could be used to project related socioeconomic impacts. However, given the multitude of factors involved with visitors' recreation decision-making, it may in some cases be too difficult or speculative to project the changes in visitation patterns within the park and future visitor responses resulting from proposed ORV and facility changes.

## ***Environmental Consequences of Alternative 1 (No Action)***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

In concept, actions to protect and enhance river values may make visiting the Merced River corridor more or less attractive to recreationists seeking different types of experiences, but in practice it would be the actions that manage visitor use and facilities that primarily would determine the number of people that are able to visit the corridor each year, and all socioeconomic impact analysis will be discussed under that topic heading for each alternative.

#### ***Impacts of Actions to Manage Visitor Use and Facilities***

The number of visitors (as presented in table 9-113 above) and the spending patterns (as presented in table 9-107 above) are both used as inputs to the MGM2 model. To conform to the visitor group per night/day format required by the MGM2 model, the total number of recreation visits counted at the entrances to the park is translated first into “Visits in Party-Days/Nights” in **table 9-172**. The translation of individual visitors to groups takes into account factors for

- each visitor market segment’s share of total entries to the park
- re-entry rate (park entries per trip)
- average visitor group size
- length of stay (days or nights)

The MGM2 model analyzes spending and impacts by visitor market segment, defined as follows:

- Local-Day User: corresponds to people who live within the four-county region who recreate in the park.
- Non-Local-Day User: person living or staying outside the four-county region who is able to visit the park on a day use basis.
- Motel-In: people staying inside the park within any of the types of lodging accommodations available, other than campgrounds.
- Camp-In: people staying overnight inside the park in developed campgrounds.
- Motel-Out: people staying in commercial lodging outside the park, but within the four-county region.
- Camp-Out: people staying in campgrounds outside the park, but within the four-county region.
- Other Overnight: a miscellaneous category used by the model that includes, among other things, people staying in the backcountry.

**TABLE 9-172: ANALYSIS OF TOTAL VISITATION BY MARKET SEGMENT**

Visitor Market Segment	Visitor Market Segment Share of Park Entries <sup>a</sup>	Calculated Distribution of Visitors	Re-Entry Rate <sup>a</sup>	Visitor Trips to the Park	Ave. Group Size <sup>a</sup>	Visitor Groups	Length of Stay (Nights or Days) <sup>a</sup>	Visits in Party-Days / Nights
<b>Total Visitors: Alt. 1</b>		<b>3,951,393</b>						
Local-Day User	4.0%	158,056	1.1	143,687	2.2	65,312	1.0	65,312
Non-Local-Day User	24.0%	948,334	1.1	862,122	3.0	287,374	1.0	287,374
Motel-In	11.5%	454,410	1.1	413,100	3.5	118,029	2.4	283,269
Camp-In	9.5%	375,382	1.3	288,756	3.5	82,502	2.8	231,005
Motel-Out	36.5%	1,442,258	1.7	848,387	3.1	273,673	2.2	602,081
Camp-Out	4.0%	158,056	1.9	83,187	3.8	21,891	3.1	67,863
Other Overnight	10.5%	414,896	1.4	296,354	2.8	105,841	2.5	264,602
<b>Totals</b>	<b>100.0%</b>	<b>3,951,393</b>		<b>2,935,594</b>		<b>954,622</b>		<b>1,801,506</b>
<sup>a</sup> Findings from the 2009 Visitor Services Project survey results as reported in Cook, Philip S., <i>Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009</i> , February, 2011 SOURCE: As noted, with Land Economics Consultants analysis 2012								

The MGM2 model first calculates total visitor spending as presented in **table 9-173**. Within a 50-mile radius of the park, Yosemite visitors spent over \$381 million measured in 2010 dollars for the baseline visitor year. This is a measure of the most directly observable socioeconomic impact visitors have on the region before estimating multiplier effects.

**TABLE 9-173: VISITOR GROUPS AND THEIR TOTAL SPENDING BY MARKET SEGMENT FOR THE NO ACTION ALTERNATIVE**

Segment	Visits in Party-Days/Nights	Average Spending (\$)	Total Spending in 2010 \$1,000s	Percent of Spending
Local-Day User	65,312	\$74.64	\$4,875	1%
Non-Local-Day User	287,374	\$86.71	\$24,917	7%
Motel-In	283,269	\$371.17	\$105,142	28%
Camp-In	231,005	\$170.02	\$39,276	10%
Motel-Out	602,081	\$312.95	\$188,424	49%
Camp-Out	67,863	\$130.81	\$8,877	2%
Other Overnight	264,602	\$37.54	\$9,933	3%
<b>Totals</b>	<b>1,801,506</b>	<b>\$211.74</b>	<b>\$381,444</b>	<b>100%</b>
SOURCE: MGM2 model built for Merced River Alternatives Analysis, Land Economics Consultants 2012				



Table 9-174 presents the output of the MGM2 modeling for Alternative 1. Visitor spending generates over 5,300 jobs and over a quarter billion dollars in value added for the four-county region. Value added is technically the sum of labor income, profits and rents, and indirect business taxes, and serves as the best overall measure of the total socioeconomic significance of visitor spending within the four-county study region.

**TABLE 9-174: TOTAL ECONOMIC ACTIVITY (FOUR COUNTY REGION) DUE TO VISITOR SPENDING FOR ALTERNATIVE 1 (NO ACTION)**

Sector/Spending Category	Sales \$1,000s	Jobs	Labor Income \$1,000s	Value Added \$1,000s
Direct Effects				
Motel, hotel, cabin, transient rental, or B&B	\$148,186	1,409	\$39,236	\$84,127
Camping fees	\$11,168	145	\$3,508	\$5,066
Restaurants & bars	\$63,385	1,098	\$21,287	\$34,596
Admissions & fees	\$39,551	705	\$10,618	\$23,671
Local transportation	\$23,545	495	\$11,866	\$18,020
Grocery stores	\$6,855	103	\$3,441	\$5,004
Gas stations	\$8,631	47	\$4,323	\$6,420
Other retail	\$14,907	261	\$6,876	\$11,206
Wholesale trade	\$1,510	10	\$530	\$1,123
Local Production of goods	\$189	1	\$27	\$75
<b>Total Direct Effects</b>	<b>\$317,926</b>	<b>4,274</b>	<b>\$101,712</b>	<b>\$189,308</b>
Indirect and Induced Effects	\$125,729	1,083	\$36,317	\$76,447
<b>Total Effects</b>	<b>\$443,655</b>	<b>5,357</b>	<b>\$138,029</b>	<b>\$265,754</b>
Multiplier	1.40	1.25	1.36	1.40
NOTE: Current economic impacts are measured in 2010 dollars.				
SOURCE: MGM2 model built for Merced River Alternatives Analysis, Land Economics Consultants 2012				

### *Ongoing NPS Spending*

Visitor spending accounts for the majority of economic activity, but direct spending by the NPS, through its operating budget, payroll/staffing, and capital projects, also generates economic activity in the four-county study area. Table 9-175 analyzes the economic effects of the NPS payroll and employment within the four-county region. Although the NPS only supported 892 jobs directly from its payroll in 2010, total job creation within the four-county economic region included another 294 induced jobs, for a total employment impact of almost 1,200. Similarly, the \$49 million NPS payroll generated over \$63 million in economic value to the surrounding economy.

For the No Action Alternative it is also necessary to account for the portion of the Yosemite National Park budget that goes to purposes other than direct employee compensation. As was discussed in the methodology section, over the last five years this spending has averaged approximately \$40 million per year. Table 9-176 presents an analysis of the regional impact of that spending, starting with the

**TABLE 9-175: ECONOMIC IMPACTS OF NATIONAL PARK SERVICE PAYROLL AND EMPLOYMENT**

Yosemite National Park	Direct Effects	Economic Multipliers <sup>a</sup>	Indirect and Induced Effects	Total of Direct, Indirect and Induced Effects
<b>Employment</b>				
National Park Service Jobs	892	1.33	294	1,186
<b>Labor Income</b>				
NPS Payroll <sup>b</sup>				
Salaries \$1,000s	\$39,283			
Benefits \$1,000s	\$10,123			
Total Compensation	\$49,406	1.15	\$7,643	\$57,049
<b>Value Added</b>				
Total Compensation	\$49,406	1.29	\$14,155	\$63,561
NOTE: Current economic impacts are measured in 2010 dollars.				
<sup>a</sup> Multipliers are from IMPLAN sector 439, federal government/nonmilitary employment and payroll.				
<sup>b</sup> As reported in Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010</i> , Natural Resource Report NPS/NRSS/EQD/NRR--2011/481.				
SOURCES: As noted; Land Economics Consultants analysis 2012				

**TABLE 9-176: ECONOMIC IMPACTS OF THE NON-PAYROLL PORTION OF THE NPS BUDGET IN THE NO ACTION ALTERNATIVE**

Spending by Sector	Average Annual Budget		Value Added		Employment	
	Assumed Percent	(Millions \$)	Multiplier <sup>a</sup>	(Millions \$)	Multiplier (Jobs/\$ million) <sup>b</sup>	No. of Jobs
Construction Sector	80%	\$32.0	0.66	\$21.1	10.93	231
Professional Services	20%	\$8.0	0.81	\$6.5	19.42	126
<b>Total</b>	<b>100%</b>	<b>\$40.0</b>		<b>\$27.6</b>		<b>357</b>
<sup>a</sup> Multipliers are averages of IMPLAN sectors 34 and 36, and 369 and 375.						
<sup>b</sup> Employment multipliers are number of jobs per million dollars of value added in the region.						
SOURCES: As noted; Land Economics Consultants analysis						

assumption that approximately 80% goes into the construction sector and 20% into such professional services as architecture, engineering, environmental and other technical consulting services. Not all of the NPS spending on contractor activities is captured within the four-county region because some firms are from beyond this area, resulting in multipliers that are less than 1.00. Including the direct, indirect and induced effects on value added, however, the majority stays within the region and supports the equivalent of approximately 357 additional jobs in the four counties.

It is assumed that a comparable average annual spending of approximately \$40 million will continue to occur in all of the action alternatives in order to maintain the park's facilities and infrastructure over the long run. As such there will be no differential impact between alternatives from this activity. On the other

hand, there will be different one-time costs to modify facilities and infrastructure to implement each alternative, and those impacts will be discussed below for each alternative.

Note that some projects have been undertaken by park partners in the past, which in theory would have added more spending and employment to what is formally in the NPS budget. Future actions of park partners, however, are expected to be independent of which management alternative NPS selects for the Merced River, and thus would be the same for all alternatives. As such, there is no need to treat them further in this analysis.

Also note that all concessioner employment is supported by concessioner revenues derived from visitor spending in concessioner operated facilities. In other words, all concessioner socioeconomic impacts are included in the analysis of visitor spending above.

### **Summary of Impacts Under Alternative 1 (No Action)**

Current trends would be expected to continue under Alternative 1. These trends include full occupancy of lodging and day parking in the park during peak use periods, which implies there is additional demand for visits to the park that is currently being unmet, and would continue to be unmet during peak periods in the future. Some of that unmet demand may increase the demand for visitor services in gateway communities.

Cumulative socioeconomic impacts are derived from changes in the visitor recreation experience and are based on analysis of past, present, and reasonably foreseeable future actions in the Yosemite region (local and regional) in combination with potential effects of each alternative. Actions evaluated include primarily those that could affect the level of visitation parkwide and/or the amount of spending by visitors to Yosemite National Park. In addition, changes to NPS staffing levels, operating budget outlays, or capital projects that could affect the economy in the four-county region containing the park are also evaluated.

### ***Past Actions***

Today's mix of facilities and infrastructure to accommodate visitors in the park and the attractiveness of the recreational activities available has essentially been created by the cumulative effects of past actions. The more people that visit the park, and the longer they stay in the four-county region, the more likely they are to spend money, which benefits the regional economy. Past actions that have generally resulted in beneficial socioeconomic effects are those that enhance the visitor experience or provide better transportation infrastructure. Past actions generating beneficial socioeconomic effects include El Portal Road Improvement Project, Rehabilitate Yosemite Valley Campground Restrooms, Yosemite Valley Shuttle Bus Procurement, Yosemite Valley Shuttle Bus Stop Improvements, Wawona Road Rehabilitation Project, and the Lower Yosemite Fall Project. Such projects help to incrementally accommodate high volumes of visitors, to satisfy strong demand and visitor spending is a resulting consequence.

The *Half Dome Trail Stewardship Plan* is an example of an action that has reduced access for some visitors and improved the experience for other visitors. In economic terms, such actions have the potential to reduce the number of visitors but increase the "willingness to pay" or strength of demand among those who remain.

However, other past actions (or inactions after natural events) have had adverse impacts on the size of the regional economy by reducing overnight lodging and camping facilities in Yosemite Valley. Major examples include:

- *1997 Flood* – The Park sustained heavy impacts to campgrounds, roads, and lodging. The subsequent closure of the Upper & Lower River Campgrounds resulted in the loss of 376 campsites, and approximately one-half of the units at the Yosemite Lodge (there had been 440 units, which decreased to approximately 245). The El Portal Road was under construction for a year (which had regional impacts to Mariposa County from pass through visitors).
- *2000 Yosemite Valley Plan* – The mandatory mass transit element proposed in the YVP to this day causes confusion among potential visitors and may be affecting visitation.
- *2006 Ferguson Rockslide* – This had an adverse effect on parts of the regional economy, primarily the Mariposa area, when Highway 140 was closed for approximately 6 months (during the summer of 2006) for road repairs; however Groveland and Oakhurst benefited from traffic rerouting through those gateways.
- *2008 Rock falls in Curry Village* – Approximately one-third of the overnight accommodations were lost due to the establishment of a rockfall hazard zone. This had an effect on both the concessioner and Mariposa County in terms of TOT. However, a portion of the accommodations were re-established in Boys Town – a.k.a. the “signature tents.”
- *2012 Hanta virus in Curry Village* – Not only has this situation caused a decline in stays at Curry Village, there have been thousands of systemic cancelations parkwide as a result.

Decisions not to immediately replace units lost through natural disasters have exacerbated a shortage of accommodations during periods of high demand and thus reduced the amount of economic activity attainable during peak periods.

### ***Present Actions***

Similar to past actions, some present actions may result in beneficial socioeconomic effects by improving visitor access, providing recreational opportunities, or adding facilities that offer educational and cultural experiences. Specific examples of present actions that have beneficial effects on socioeconomics include the following:

***Improved Facilities:*** Ahwahnee Comprehensive Rehabilitation Plan, Rehabilitate Wawona Road, Tioga Road Rehabilitations, and Tioga Road Corridor Campground Accessibility Improvements

***Opportunities for Unique Recreational Experiences:*** Commercial Use Authorization for Commercial Activities

### ***Reasonably Foreseeable Future Actions***

Future actions could have both beneficial and adverse socioeconomic effects. Parkwide visitation may be affected to some degree by the Tuolumne River Plan once the Record of Decision is reached and the plan implemented. Future natural events may also have an impact, with weather, waterfall volumes, forest fires and other events affecting visitation. Demand for visits to the park will also likely evolve in

the future due to changing demographics of visitors to Yosemite. New facilities planned for the reasonably foreseeable future can also affect visitation and include:

***New Visitor Facilities:*** Wahhoga Indian Cultural Center and Henness Ridge Environmental Education Center

### ***Overall Cumulative Impact***

Future management of Yosemite National Park, particularly areas within or near the Merced River corridor, could result in either beneficial or adverse effects on total economic activity within the four-county region as described above. The socioeconomic impacts of the future management plans embodied in Alternatives 2–6 will be estimated by examining their differences between them and Alternative 1. Except as modified by present and reasonably foreseeable future actions already planned, Alternative 1 would essentially leave conditions as they exist today. Alternative 1 would not meaningfully expand the inventory of camping and overnight lodging opportunities in Yosemite National Park. Although this would not have a cumulatively additive effect compared with current conditions, it would when compared with conditions at the time of designation (1987) and would represent a continued reduction in camping opportunities.

The overall cumulative effect of Alternative 1 would be that visitation is likely to continue to grow at an average rate of approximately 3% per year in the near term (i.e., the next five years). Without new accommodations in Yosemite Valley, growth could occur during peak periods if people substitute accommodations outside the park for preferred in-park camping and lodging. Growth could also occur if the numbers of visitors increases during nonpeak periods. Current total annual visitation is near the historic high of approximately 4 million visitors, though visitor volumes have ranged as low as 3.2 million over the last decade, and the 10-year average is 3.5 million per year. The baseline year in Alternative 1 of 3.95 million is very close to the highest visitation ever experienced. Based on these considerations, the cumulative economic impact of past, present, and reasonably foreseeable future actions, when combined with those of Alternative 1, would be regional, long term, negligible, and beneficial.

### ***Environmental Consequences to Actions Common to Alternatives 2–6***

#### **All River Segments**

##### ***Impacts of Actions to Manage Visitor Use and Facilities***

Changes in management policies can have impacts on the regional economy that will follow effects commonly observed in market economies. A general *qualitative* description of some of the more common effects includes the following:

- For people seeking a visitor experience that includes more than just a daytrip to the park, demand for overnight accommodations tends to focus on Yosemite Valley first and then radiate outwards, filling motels and campgrounds in gateway communities and beyond as those closer fill up. Restriction on supply of accommodations in the park can increase demand outside, and building new campsites or lodging units in the park can decrease demand for accommodations in gateway communities.

- Due to the substitution effect described above, some people seeking an overnight experience in the park but unable to secure accommodations may be willing to substitute a lodging unit in a gateway community for their preferred unit in the Valley, and effectively become repeat day visitors to the park. Their willingness to move to a gateway location would depend in part, however, on their certainty of being able to access the park on a day use basis. A day-use reservation system that assures them that they will have access to the park, even if they are not staying in it, may increase demand for lodging in gateway communities.
- Due to the displacement, or time-shift, effect described above, some people unable to find accommodations in peak seasons may reschedule a planned visit to the park for a lower demand season. But because weather can be less predictable in the shoulder seasons, not all types of accommodations are conducive to this type of time shifting. While hard-sided cabin units may be able to accommodate travelers year round, camping and tent accommodations may not work as well in shoulder seasons.
- The single private business most heavily impacted by Alternatives 2–6 within the park would be the concessioner. A reduction in the inventory of lodging, or in the commercial recreational activities allowed, would decrease concessioner revenues and ultimately reduce the number of concessioner employees needed. With fewer supplies needed and with less employee spending coming out of the park, there would be further reductions through the multiplier effects to the size of the four-county regional economy. But at the same time demand that can no longer be satisfied within the park may shift outside to gateway communities to some extent. This may create new business opportunities there, which would also have multiplier effects that expand the regional economy. The net effects would likely be less dire than the adverse impacts estimated when looking at the concessioner and park alone.
- The existing concessioner is on a short-term extension of an older contract during the study process now underway. Once a management alternative is selected, and the framework for a new concession operation is established, a new concession contract would be executed. The standard NPS process requires that the new agreement represent a viable business, even if it is dramatically different than the business operation that was in place before. In other words, within the park there would be a one-time change to the business model for the concession operation that is agreeable to all parties. To the extent that the new concession business is smaller than what was there before, additional private business opportunities may be created outside the park.
- Each action alternative includes a set of project elements that would restore specific areas or construct and rehabilitate facilities to support visitor use. One-time spending on these capital projects would temporarily employ people in the construction industry within the four-county region. Some specialized construction skills and materials may be imported from beyond the adjacent four counties, but these projects would generate some new income for residents of the region, and the respending of that income would ripple outwards and further expand the economy of the region. The one-time beneficial impacts of construction would subside once the set of projects is fully implemented.

In terms of specific *quantitative* impacts created by the primary drivers of socioeconomics—spending by visitors and the NPS—each action alternative would have a unique impact, and no impacts would be common to all alternatives.

Spending by park partners is assumed to be independent from NPS management decisions and constant across all alternatives. Because the incremental difference between Alternative 1 and Alternatives 2–6 is zero in all cases, park partner activities are not analyzed further below.

### ***Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **All River Segments**

#### ***Impacts of Actions to Manage Visitor Use and Facilities***

Alternative 2 would create the greatest reduction in lodging units among Alternatives 2–6, with 43% fewer units than under Alternative 1. Camping spaces in Yosemite Valley would be slightly reduced, by about 3%. The peak day-use parking and transportation infrastructure in Yosemite Valley would be reduced by 37%. As a result, total annual visitation under Alternative 2 would be a reduction to approximately 3.6 million visitors per year. **Table 9-177** applies results of the VSP survey findings to translate that total annual visitation estimate into visitor groups by market segment, which is necessary for input to the economic models.

**TABLE 9-177: ALTERNATIVE 2 — ANALYSIS OF TOTAL VISITATION BY MARKET SEGMENT**

Visitor Market Segment	Visitor Market Segment Share of Park Entries <sup>a</sup>	Calculated Distribution of Visitors	Re-Entry Rate <sup>a</sup>	Visitor Trips to the Park	Ave. Group Size	Visitor Groups	Length of Stay (Nights or Days) <sup>a</sup>	Visits in Party-Days / Nights
<b>Total Visitors: Alt. 2</b>	<b>3,644,879</b>							
Local-Day User	4.0%	145,795	1.1	132,541	2.2	60,246	1.0	60,246
Non-Local-Day User	24.0%	874,771	1.1	795,246	3.0	265,082	1.0	265,082
Motel-In	11.5%	419,161	1.1	381,056	3.5	108,873	2.4	261,295
Camp-In	9.5%	346,264	1.3	266,357	3.5	76,102	2.8	213,085
Motel-Out	36.5%	1,330,381	1.7	782,577	3.1	252,444	2.2	555,377
Camp-Out	4.0%	145,795	1.9	76,734	3.8	20,193	3.1	62,599
Other Overnight	10.5%	382,712	1.4	273,366	2.8	97,631	2.5	244,077
<b>Totals</b>	<b>100.0%</b>	<b>3,644,879</b>		<b>2,707,877</b>		<b>880,571</b>		<b>1,661,761</b>
<sup>a</sup> Findings from the 2009 Visitor Services Project survey results as reported in Cook, Philip S., <i>Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009</i> , February, 2011 SOURCE: As noted, with Land Economics Consultants analysis 2012								

**Table 9-178** summarizes total spending derived from the level of visitation produced by analysis of the full pattern of spending within the MGM2 model.

**TABLE 9-178: ALTERNATIVE 2 — VISITOR GROUPS AND TOTAL SPENDING BY MARKET SEGMENT**

Market Segment	Visits in Party-Days/Nights	Average Spending (\$)	Total Spending in 2010 \$000s	Percent of Spending
Local-Day User	60,246	\$74.64	\$4,497	1%
Non-Local-Day User	265,082	\$86.71	\$22,985	7%
Motel-In	261,295	\$371.17	\$96,986	28%
Camp-In	213,085	\$170.02	\$36,229	10%
Motel-Out	555,377	\$312.95	\$173,807	49%
Camp-Out	62,599	\$130.81	\$8,188	2%
Other Overnight	244,077	\$37.54	\$9,163	3%
<b>Totals</b>	<b>1,661,761</b>	<b>\$211.74</b>	<b>\$351,855</b>	<b>100%</b>
SOURCE: MGM2 model built for Merced River Analysis, Land Economics Consultants 2012				

The MGM2 model also estimates total economic activity in terms of job creation, income to workers, and value added to the four-county regional economy, as presented in **table 9-179**. **Table 9-179** summarizes the total economic activity associated with visitor spending for Alternative 2. **Table 9-180** calculates the economic impacts of NPS spending.

**TABLE 9-179: ALTERNATIVE 2 — TOTAL ECONOMIC ACTIVITY DUE TO VISITOR SPENDING (FOUR COUNTY REGION)**

Sector/Spending Category	Sales \$000s	Jobs	Labor Income \$000s	Value Added \$000s
<b>Direct Effects</b>				
Motel, hotel cabin, transient rental, or B&B	\$136,691	1,299	\$36,193	\$77,601
Camping fees	\$10,302	134	\$3,236	\$4,673
Restaurants & bars	\$58,468	1,013	\$19,636	\$31,913
Admissions & fees	\$36,483	650	\$9,794	\$21,835
Local transportation	\$21,718	456	\$10,946	\$16,622
Grocery stores	\$6,323	95	\$3,174	\$4,616
Gas stations	\$7,961	44	\$3,988	\$5,922
Other retail	\$13,750	241	\$6,343	\$10,337
Wholesale trade	\$1,393	9	\$489	\$1,036
Local Production of goods	\$174	1	\$25	\$69
<b>Total Direct Effects</b>	<b>\$293,264</b>	<b>3,943</b>	<b>\$93,822</b>	<b>\$174,623</b>
Indirect and Induced Effects	\$115,976	999	\$33,500	\$70,517
<b>Total Effects</b>	<b>\$409,240</b>	<b>4,941</b>	<b>\$127,322</b>	<b>\$245,139</b>
Multiplier	<b>1.40</b>	<b>1.25</b>	<b>1.36</b>	<b>1.40</b>
NOTE: Current economic impacts are measured in 2010 dollars.				
SOURCE: MGM2 model built for Merced River Alternatives Analysis, Land Economics Consultants 2012				



**TABLE 9-180: ALTERNATIVE 2 — ECONOMIC IMPACTS OF NATIONAL PARK SERVICE SPENDING**

Yosemite National Park	Direct Effects	Economic Multipliers <sup>a</sup>	Indirect and Induced Effects	Total of Direct, Indirect and Induced Effects
<b>Employment</b>				
National Park Service Jobs <sup>b</sup>	862	1.33	284	1,146
<b>Labor Income</b>				
NPS Payroll <sup>b</sup>				
Salaries \$000's	\$37,942			
Benefits \$000's	\$9,777			
Total Compensation	\$47,720	1.15	\$7,383	\$55,102
<b>Value Added</b>				
Total Compensation	\$47,720	1.29	\$13,672	\$61,392
NOTE: Current economic impacts are measured in 2010 dollars.				
<sup>a</sup> Multipliers are from IMPLAN sector 439, federal government/nonmilitary employment and payroll.				
<sup>b</sup> As reported in Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010</i> , Natural Resource Report NPS/NRSS/EQD/NRR--2011/481.				
SOURCES: As noted; Land Economics Consultants analysis 2012				

### Summary of Impacts from Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration

The measure of Alternative 2's socioeconomic impact is the degree to which it differs from Alternative 1. Employment has been adopted as the single best indicator of relative economic impact. The number of jobs would be roughly proportional to other possible measures of socioeconomic impact, such as the impact on personal income (which is the wage and salary income associated with jobs) or the impact on total value added within the regional economy (which, as described under Alternative 1, is technically the sum of labor income, profits and rents, and indirect business taxes). The difference in jobs supported under Alternative 2 and Alternative 1 is presented in **table 9-181**, with a detailed breakout by industrial sector within the four-county regional economy. Alternative 2, with its mix of reduced overnight lodging facilities and day use infrastructure, would support 517 fewer jobs than Alternative 1.

The adverse impacts of Alternative 2 might not be as intense as indicated by the job reduction calculated above. As described in the "Environmental Consequences Methodology" section, substitution and time-shift effects could offset some of the visitation displaced during peak times and seasons and soften or even negate the economic impact portrayed here. In the context of total employment within the four-county region, Alternative 2 would support 456 fewer jobs than Alternative 1, and because it would be less than 2.5% fewer jobs the impact would be regional, long term, negligible, and adverse (see **table 9-182**).

Job reduction would be more substantial in specific industry sectors within the four-county region, however. In the lodging industry alone, the reduction in jobs resulting from Alternative 2 would be a long-term, minor, adverse impact. However, to the extent that hotel and motel occupancy increases in gateway communities as a result of the Alternative 2 reduction in Yosemite Valley accommodations, some or all of the adverse impact could be compensated. Similarly, to the extent that overnight visitors to Yosemite Valley are displaced but shift their visits to a different time, the adverse impact could be mitigated.

**TABLE 9-181: ALTERNATIVE 2 — IMPACT ON JOBS BY INDUSTRY SECTOR (FOUR COUNTY REGION)**

Sector/Spending Category	Jobs Under Alt. 1 (No Action)	Jobs Under Alt. 2	Difference in Jobs
<b>Direct Effects</b>			
Motel, hotel cabin, or B&B	1,409	1,299	(109)
Camping fees	145	134	(11)
Restaurants & bars	1,098	1,013	(85)
Admissions & fees	705	650	(55)
Local transportation	495	456	(38)
Grocery stores	103	95	(8)
Gas stations	47	44	(4)
Other retail	261	241	(20)
Wholesale trade	10	9	(1)
Local Production of goods	1	1	(0)
<b>Total Direct Effects</b>	<b>4,274</b>	<b>3,943</b>	<b>(332)</b>
Indirect and Induced Effects	1,083	999	(84)
<b>Total Effects of Visitor Spending</b>	<b>5,357</b>	<b>4,941</b>	<b>(416)</b>
<b>National Park Service Total Employment Effects</b>	<b>1,186</b>	<b>1,146</b>	<b>(40)</b>
<b>Total Job Creation in Four Counties</b>	<b>6,543</b>	<b>6,087</b>	<b>(456)</b>
SOURCE: MGM2 model, Land Economics Consultants 2012			

**TABLE 9-182: ALTERNATIVE 2 – CHARACTERIZATION OF IMPACT SIGNIFICANCE**

Industry Sector	Total Jobs in the 4-County Region	Alt. 2: Net Impact on Jobs	Impact as % of Total	Characterization of Impact Significance	
<b>Total Impacts (including Indirect &amp; Induced Effects)</b>	<b>102,273</b>	<b>(456)</b>	<b>-0.4%</b>	<b>Negligible</b>	<b>Adverse</b>
<b>Direct Impacts on Specific Sectors<sup>a</sup></b>					
Agriculture	13,619	0	0.0%	No Impact	
Mining	310	0	0.0%	No Impact	
Construction	5,115	0	0.0%	No Impact	
Manufacturing	4,043	0	0.0%	No Impact	
Transportation (and Public Utilities)	2,074	(38)	-1.9%	Negligible	Adverse
Retail Stores (and Wholesale Trade)	10,314	(33)	-0.3%	Negligible	Adverse
Lodging Industry	3,637	(121)	-3.3%	Minor	Adverse
Restaurants and Bars	5,887	(85)	-1.4%	Negligible	Adverse
All Other Service Industries	36,446	(55)	-0.2%	Negligible	Adverse
Government (Local, State, & Fed.)	20,828	(40)	-0.2%	Negligible	Adverse
<sup>a</sup> Indirect and induced effects would be spread throughout all the sectors of the economy and would have a negligible impact.					
SOURCE: Minnesota IMPLAN Group, Inc. data; Land Economics Consultants analysis 2012					

For the Restaurant and Bar sector of the regional economy, the long-term, adverse impact on jobs would be negligible in intensity. The intensity could be reduced by substitution and time-shift effects that maintain volumes of visitors and spending.

Within the four-county regional economy, the single business in the Lodging and Restaurant sectors most affected by Alternative 2 would be the concessioner within the park. This would also constitute the one impact felt in the local context of the park, and a 43% reduction in lodging would no doubt be seen as a noticeable adverse impact by the existing concessioner. In the long term, however, a new concession agreement would result from the issuance of a Contract Prospectus describing the business opportunity offered under the *Merced Wild and Scenic River Comprehensive Management Plan* (CMP). Prior to issuing a prospectus to the public, the NPS must determine that a financially feasible business opportunity exists that would mitigate this local impact by realigning the financial performance expectations of the concessioner with the new facilities and infrastructure to support commercial visitor service in the park.

In the Transportation sector of the regional economy, the long-term, adverse impact on jobs would be negligible in intensity. Note, however, that in addition to the potential mitigating substitution and time-shift effects, the more intensive transportation management efforts under Alternative 2 might require additional staffing for regional public transportation systems and for traffic and parking management in the park.

Just as impacts are felt with different intensities in different sectors of the economy, intensities of impacts would also vary geographically within the four-county regional economy. In the smaller counties of Mariposa and Mono, where the Leisure and Hospitality sector comprises a third to half of all jobs, impacts derived from visitor spending would be more noticeable than in the larger and more diversified economies of Madera and Tuolumne counties. Within counties, gateway communities would experience impacts more intensely than larger and more distant cities that have more diversity in their economic support.

Mariposa County, and the gateway community of Mariposa within it, are likely to be the most noticeably impacted geographic areas because they combine both dependency on tourism industry spending and proximity to the park. A fiscal connection also exists because concessioner lodging in Yosemite Valley lies within Mariposa County, which receives the transient occupancy tax revenue collected there. El Portal Administrative Site falls within Mariposa County. Mariposa is further impacted because it is the closest place for park and concessioner employees to live who do not have housing within the park. Changes in the park workforce living in Mariposa County could cause increases or decreases in demand for county services and affect county revenues. Changes in the park workforce could also change school enrollment, affecting both costs and revenues for local schools.

The maximum fiscal impact of Alternative 2 on Mariposa County could include a reduction of \$716,000 in TOT revenue, based on the 10% tax rate and the difference in spending between Alternatives 1 and 2 for all types of lodging, both inside and outside the park. This would be equivalent to a 1.7% reduction in General Fund revenue for the county.

In addition to the ongoing socioeconomic impacts analyzed above, there would be one-time impacts generated by NPS spending on construction and restoration projects to implement Alternative 2, estimated to cost a total of \$168 million. If these implementation projects took place evenly over a five-year period, the \$34 million per year would be equal to a 4.7% increase in Construction sector output within the region (table 9-124). This impact on the Construction sector would be regional, short term, minor, and beneficial. If the implementation were spread evenly over a longer period of 20 years, the intensity of the impact would drop to negligible.

## **Cumulative Impacts from Alternative 2**

### ***Past Actions***

Past actions would affect Alternative 2 to the same degree they affect Alternative 1 for socioeconomic impacts.

### ***Present Actions***

Present actions would affect Alternative 2 to the same degree they affect Alternative 1 for socioeconomic impacts.

### ***Reasonably Foreseeable Future Actions***

For socioeconomic impacts, the cumulatively considerable factors would be the same as those described above for Alternative 1. These would include the effects of private decisions made in the gateway communities and elsewhere in the four-county region, as well as those of public decisions in the region and within the park. Over the long run, one of the most functional features of market economies is that they trend toward self-correction. If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may build to the point that private interests may expand supply in surrounding areas by developing additional lodging, restaurants, and other facilities. These effects are likely to be strongest in areas closest to the park, and due to its proximity Mariposa County could be a beneficiary of this additional market demand. Specific present actions that could facilitate the capture of additional development include

- *Mariposa County General Plan Housing Element Update*
- *Mariposa County General Plan (Update)*

Short of new construction, additional demand may be satisfied by increasing hours and seasons of operations, adding additional staff, and other business operating responses to expand capacities in gateway communities. In the short run, management policies within the park can alter the flow of visitors and shift the mix of overnight and day visitors, but in the long run market adaptations can continue to increase the annual volumes of people visiting the park. Based on these considerations, the cumulative economic impact of past, present, and reasonably foreseeable future actions, when combined with those of Alternative 2, would be regional, long term, negligible, and adverse.

## **Irreversible and Irretrievable Commitment of Resources for Alternative 2**

For the most part, socioeconomic actions are reversible in the sense that markets adapt to changing circumstances and public policies can change strategies over time. On the other hand, the implementation of Alternative 2 would require the one-time expenditure of approximately \$168 million to implement the various actions proposed. Once expended, those financial resources would no longer be available for other possible uses, and relatively permanent changes to facilities and infrastructure in the park would have been made. Physical changes made for Alternative 2 may be reversed in the future, but additional financial resources would be required to do so.

## **Relationship of Short-Term Uses and Long-Term Productivity for Alternative 2**

Construction and restoration projects to implement Alternative 2 would create short-term disruptions to visitor use patterns during construction. There would also be a short-term, one-time change to the business model for the concessioner in the park, with a new concession agreement put in place to be consistent with the objectives and scale of facilities produced by Alternative 2. In the long term, a new pattern of economic flows in the region would emerge that would supply visitor services to meet the new level of visitor demand.

## ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Manage Visitor Use and Facilities***

Alternative 3 would create the second largest reduction in lodging units, with 38% fewer units than under Alternative 1. The inventory of camping spaces in Yosemite Valley would increase slightly, by about 2%. The day use infrastructure in the Valley would see the largest reduction of all the alternatives, by 44%. As a result, total annual visitation under Alternative 3 would be a reduction to 3.6 million visitors per year. **Table 9-183** applies results of the VSP survey findings to translate that total annual visitation estimate into visitor groups by market segment, which is necessary for input to the economic models.

**Table 9-184** summarizes total spending derived from the level of visitation produced by analysis of the full pattern of spending within the MGM2 model. The MGM2 model also estimates total economic activity in terms of job creation, income to workers, and value added to the four-county regional economy, as presented in **table 9-185**. **Table 9-186** calculates economic impacts of NPS spending.

**TABLE 9-183: ALTERNATIVE 3 — ANALYSIS OF TOTAL VISITATION BY MARKET SEGMENT**

Visitor Market Segment	Visitor Market Segment Share of Park Entries <sup>a</sup>	Calculated Distribution of Visitors	Re-Entry Rate <sup>a</sup>	Visitor Trips to the Park	Ave. Group Size <sup>a</sup>	Visitor Groups	Length of Stay (Nights or Days) <sup>a</sup>	Visits in Party-Days / Nights
<b>Total Visitors: Alt. 3</b>	<b>3,585,536</b>							
Local-Day User	4.0%	143,421	1.1	130,383	2.2	59,265	1.0	59,265
Non-Local-Day User	24.0%	860,529	1.1	782,299	3.0	260,766	1.0	260,766
Motel-In	11.5%	412,337	1.1	374,851	3.5	107,100	2.4	257,041
Camp-In	9.5%	340,626	1.3	262,020	3.5	74,863	2.8	209,616
Motel-Out	36.5%	1,308,721	1.7	769,836	3.1	248,334	2.2	546,335
Camp-Out	4.0%	143,421	1.9	75,485	3.8	19,864	3.1	61,580
Other Overnight	10.5%	376,481	1.4	268,915	2.8	96,041	2.5	240,103
<b>Totals</b>	<b>100.0%</b>	<b>3,585,536</b>		<b>2,663,789</b>		<b>866,234</b>		<b>1,634,706</b>
<sup>a</sup> Findings from the 2009 Visitor Services Project survey results as reported in Cook, Philip S., <i>Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009</i> , February, 2011 SOURCE: As noted, with Land Economics Consultants analysis 2012								

**TABLE 9-184: ALTERNATIVE 3 – VISITOR GROUPS AND TOTAL SPENDING BY MARKET SEGMENT**

Market Segment	Visits in Party-Days/Nights	Average Spending (\$)	Total Spending in 2010 \$000s	Percent of Spending
Local-Day User	59,265	\$74.64	\$4,423	1%
Non-Local-Day User	260,766	\$86.71	\$22,610	7%
Motel-In	257,041	\$371.17	\$95,407	28%
Camp-In	209,616	\$170.02	\$35,640	10%
Motel-Out	546,335	\$312.95	\$170,978	49%
Camp-Out	61,580	\$130.81	\$8,055	2%
Other Overnight	240,103	\$37.54	\$9,014	3%
<b>Totals</b>	<b>1,634,706</b>	<b>\$211.74</b>	<b>\$346,127</b>	<b>100%</b>
SOURCE: MGM2 model built for Merced River Analysis, Land Economics Consultants 2012				

**TABLE 9-185: ALTERNATIVE 3 — TOTAL ECONOMIC ACTIVITY DUE TO VISITOR SPENDING**

Sector/Spending Category	Sales \$000s	Jobs	Labor Income \$000s	Value Added \$000s
<b>Direct Effects</b>				
Motel, hotel cabin, transient rental, or B&B	\$134,466	1,278	\$35,603	\$76,338
Camping fees	\$10,134	132	\$3,184	\$4,597
Restaurants & bars	\$57,516	996	\$19,316	\$31,393
Admissions & fees	\$35,889	640	\$9,634	\$21,479
Local transportation	\$21,365	449	\$10,768	\$16,351
Grocery stores	\$6,220	94	\$3,122	\$4,541
Gas stations	\$7,832	43	\$3,923	\$5,825
Other retail	\$13,527	237	\$6,239	\$10,169
Wholesale trade	\$1,370	9	\$481	\$1,019
Local Production of goods	\$171	1	\$25	\$68
<b>Total Direct Effects</b>	<b>\$288,489</b>	<b>3,878</b>	<b>\$92,295</b>	<b>\$171,780</b>
Indirect and Induced Effects	\$114,088	982	\$32,955	\$69,368
<b>Total Effects</b>	<b>\$402,577</b>	<b>4,861</b>	<b>\$125,249</b>	<b>\$241,148</b>
Multiplier	1.40	1.25	1.36	1.40
NOTE: Current economic impacts are measured in 2010 dollars.				
SOURCE: MGM2 model built for Merced River Alternatives Analysis, Land Economics Consultants 2012				

**TABLE 9-186: ALTERNATIVE 3 — ECONOMIC IMPACTS OF NATIONAL PARK SERVICE SPENDING**

Yosemite National Park	Direct Effects	Economic Multipliers <sup>a</sup>	Indirect and Induced Effects	Total of Direct, Indirect and Induced Effects
<b>Employment</b>				
National Park Service Jobs <sup>b</sup>	856	1.33	282	1,138
<b>Labor Income</b>				
NPS Payroll <sup>b</sup>				
Salaries \$000s	\$37,683			
Benefits \$000s	\$9,711			
Total Compensation	\$47,393	1.15	\$7,332	\$54,725
<b>Value Added</b>				
Total Compensation	\$47,393	1.29	\$13,579	\$60,972
NOTE: Current economic impacts are measured in 2010 dollars.				
<sup>a</sup> Multipliers are from IMPLAN sector 439, federal government/nonmilitary employment and payroll.				
<sup>b</sup> As reported in Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010</i> , Natural Resource Report NPS/NRSS/EQD/NRR--2011/481.				
SOURCES: As noted; Land Economics Consultants analysis 2012				

### Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration

The difference in jobs supported under Alternative 3 and Alternative 1 is presented in **table 9-187**, with a detailed breakout by industrial sector within the four-county regional economy. Alternative 3, with its smaller inventory of overnight lodging facilities and reduced day use infrastructure, would support 544 fewer jobs than Alternative 1 (No Action). Similarly to Alternative 2, the adverse impacts of Alternative 3 might not be as intense as indicated by the job reduction calculated above due to substitution and time-shift effects. In the context of total employment within the four-county region, the reduction in jobs resulting from Alternative 3 would be a long-term, adverse impact, but because at -0.5% it is less than the -2.5% threshold for minor, it would be negligible in intensity (see **table 9-188**).

For specific industry sectors within the four-county region, however, the job reduction would be more significant. In the lodging industry alone, the reduction in jobs resulting from Alternative 3 would be a long-term, minor, adverse impact. As noted above, to the extent that hotel and motel occupancies increase in gateway communities as a result of the Alternative 3 reduction in Yosemite Valley accommodations, some or all of the adverse impact could be mitigated. Similarly, to the extent that overnight visitors to the Valley are displaced but shift their visits to a different time, the adverse impact could be mitigated.

In the Restaurant and Bar sector of the regional economy, the long-term, adverse impact on jobs would be negligible in intensity. The intensity could be reduced by substitution and time-shift effects that maintain volumes of visitors and spending.

Within the four-county regional economy, the single business in the Lodging and Restaurant sectors most affected by Alternative 3 would be the concessioner within the park. This would also constitute the one impact felt in the local context of the park, and a 36% reduction in lodging would no doubt be seen as a noticeable adverse impact by the existing concessioner. In the long term, however, a new concession agreement would result from the issuance of a Contract Prospectus describing the business opportunity offered under the CMP. Prior to issuing a Prospectus to the public, the NPS must determine that a financially feasible business opportunity exists that would mitigate this local impact by realigning the financial performance expectations of the concessioner with the new opportunity for commercial visitor service in the park.

In the Transportation sector of the regional economy, the long-term, adverse impact on jobs would be negligible in intensity. Note, however, that in addition to the potential mitigating substitution and time-shift effects, the more intensive transportation management efforts under Alternative 3 might require additional staffing for regional public transportation systems and for traffic and parking management in the park.

Just as impacts are felt with different intensities in different sectors of the economy, intensities of impacts would also vary geographically within the four-county regional economy. In the smaller counties of Mariposa and Mono, where the Leisure and Hospitality sector comprises a third to half of all jobs, impacts derived from visitor spending would be more noticeable than in the larger and more diversified economies of Madera and Tuolumne counties. Within counties, gateway communities would experience impacts more intensely than larger and more distant cities that have more diversity in their economic support.



**TABLE 9-187: ALTERNATIVE 3 — IMPACT ON JOBS BY INDUSTRY SECTOR**

Sector/Spending Category	Jobs Under Alt. 1 (No Action)	Jobs Under Alt. 3	Difference in Jobs
<b>Direct Effects</b>			
Motel, hotel, cabin, or B&B	1,409	1,278	(130)
Camping fees	145	132	(13)
Restaurants & bars	1,098	996	(102)
Admissions & fees	705	640	(65)
Local transportation	495	449	(46)
Grocery stores	103	94	(10)
Gas stations	47	43	(4)
Other retail	261	237	(24)
Wholesale trade	10	9	(1)
Local Production of goods	1	1	(0)
<b>Total Direct Effects</b>	<b>4,274</b>	<b>3,878</b>	<b>(396)</b>
Indirect and Induced Effects	1,083	982	(100)
<b>Total Effects of Visitor Spending</b>	<b>5,357</b>	<b>4,861</b>	<b>(496)</b>
<b>National Park Service Total Employment Effects</b>	<b>1,186</b>	<b>1,138</b>	<b>(48)</b>
<b>Total Job Creation in Four Counties</b>	<b>6,543</b>	<b>5,999</b>	<b>(544)</b>
SOURCE: MGM2 model, Land Economics Consultants 2012			

**TABLE 9-188: ALTERNATIVE 3 — CHARACTERIZATION OF IMPACT SIGNIFICANCE**

Industry Sector	Total Jobs in the 4-County Region	Alt. 3: Net Impact on Jobs	Impact as % of Total	Characterization of Impact Significance	
<b>Total Impacts (including Indirect &amp; Induced Effects)</b>	<b>102,273</b>	<b>(544)</b>	<b>-0.5%</b>	Negligible	Adverse
<b>Direct Impacts on Specific Sectors<sup>a</sup></b>					
Agriculture	13,619	0	0.0%	No Impact	
Mining	310	0	0.0%	No Impact	
Construction	5,115	0	0.0%	No Impact	
Manufacturing	4,043	0	0.0%	No Impact	
Transportation (and Public Utilities)	2,074	(46)	-2.2%	Negligible	Adverse
Retail Stores (and Wholesale Trade)	10,314	(39)	-0.4%	Negligible	Adverse
Lodging Industry	3,637	(144)	-4.0%	Minor	Adverse
Restaurants and Bars	5,887	(102)	-1.7%	Negligible	Adverse
All Other Service Industries	36,446	(65)	-0.2%	Negligible	Adverse
Government (Local, State, & Fed.)	20,828	(48)	-0.2%	Negligible	Adverse
<sup>a</sup> Indirect and induced effects would be spread throughout all sectors of the economy and would have a negligible impact.					
SOURCE: Minnesota IMPLAN Group, Inc. data; Land Economics Consultants analysis 2012					

Mariposa County, and the gateway community of Mariposa within it, is likely to be the most noticeably impacted geographic areas because they combine both dependency on tourism industry spending and proximity to the park. There is also a fiscal connection in that the concessioner lodging in Yosemite Valley lies within Mariposa County, which receives the transient occupancy tax revenue collected there. El Portal Administrative Site falls within Mariposa County. Mariposa is further impacted because it is the closest place for park and concessioner employees to live who do not have housing within the park. Changes in the park workforce living in Mariposa County could cause increases or decreases in demand for county services and affect county revenues. Changes in park workforce could also change school enrollment, affecting both costs and revenues for local schools.

The maximum fiscal impact of Alternative 3 on Mariposa County could include a reduction of \$855,000 in TOT revenue, based on the 10% tax rate and the difference in spending between Alternatives 1 and 3 for all types of lodging, both inside and outside the park. This would be equivalent to a 2.0% reduction in General Fund revenue for the county.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

#### ***Past Actions***

Past actions would affect Alternative 3 to the same degree they affect Alternative 1 for socioeconomic impacts.

#### ***Present Actions***

Present actions would affect Alternative 3 to the same degree they affect Alternative 1 for socioeconomic impacts.

#### ***Reasonably Foreseeable Future Actions***

For socioeconomic impacts, the cumulatively considerable factors would be the same as those described above for Alternative 1. These would include the effects of private decisions made in the gateway communities and elsewhere in the four-county region, as well as those of public decisions in the region and within the park. Over the long run, one of the most functional features of market economies is that they trend toward self-correction. If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may build to the point that private interests may expand supply in surrounding areas by developing additional lodging, restaurants, and other facilities. These effects are likely to be strongest in areas closest to the park, and due to its proximity Mariposa County could be a beneficiary of this additional market demand. Specific present actions that could facilitate the capture of additional development include

- *Mariposa County General Plan Housing Element Update*
- *Mariposa County General Plan (Update)*

Short of new construction, additional demand may be satisfied by increasing hours and seasons of operations, adding additional staff, and other business operating responses to expand capacities in gateway communities. In the short run, management policies within the park can alter the flow of visitors and shift the mix of overnight and day visitors, but in the long run market adaptations can continue to increase the annual volumes of people visiting the park. Based on these considerations, the cumulative economic impact of past, present, and reasonably foreseeable future actions, when combined with those of Alternative 3, would be regional, long term, negligible, and adverse.

### **Irreversible and Irretrievable Commitment of Resources for Alternative 3**

For the most part, socioeconomic actions are reversible in the sense that markets adapt to changing circumstances and public policies can change strategies over time. On the other hand, the implementation of Alternative 3 would require the one-time expenditure of approximately \$147 million. Once expended, those financial resources would no longer be available for other possible uses, and relatively permanent changes to facilities and infrastructure in the park would have been made. Physical changes made under Alternative 3 may be reversed in the future, but additional financial resources would be required to do so.

### **Relationship of Short-Term Uses and Long-Term Productivity for Alternative 3**

Construction and restoration projects to implement Alternative 3 would create short-term disruptions during construction, but would produce desired changes to the park over the long term. There would also be a short-term, one-time change to the business model for the concessioner in the park, with a new concession agreement put in place to be consistent with the objectives and scale of facilities produced under Alternative 3. In the long term, a new pattern of economic flows in the region would be likely to emerge that would supply visitor services to meet the new level of visitor demand.

## ***Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Manage Visitor Use and Facilities***

Alternative 4 would create a reduction in lodging units, with 20% fewer units than under Alternative 1 (No Action). On the other hand, the inventory of camping spaces in Yosemite Valley would increase by about 50%. The peak day-use infrastructure in the Valley would see a reduction of 29%. As a result, total annual visitation under Alternative 4 was a reduction to approximately 3.88 million visitors per year. **Table 9-189** applies results of the VSP survey findings to translate that total annual visitation estimate into visitor groups by market segment, which is necessary for input to the economic models.

**TABLE 9-189: ALTERNATIVE 4 — ANALYSIS OF TOTAL VISITATION BY MARKET SEGMENT**

Visitor Market Segment	Visitor Market Segment Share of Park Entries <sup>a</sup>	Calculated Distribution of Visitors	Re-Entry Rate <sup>a</sup>	Visitor Trips to the Park	Ave. Group Size <sup>a</sup>	Visitor Groups	Length of Stay (Nights or Days) <sup>a</sup>	Visits in Party-Days / Nights
<b>Total Visitors: Alt. 4</b>		<b>3,877,354</b>						
Local-Day User	4.0%	155,094	1.1	140,995	2.2	64,088	1.0	64,088
Non-Local-Day User	24.0%	930,565	1.1	845,968	3.0	281,989	1.0	281,989
Motel-In	11.5%	445,896	1.1	405,360	3.5	115,817	2.4	277,961
Camp-In	9.5%	368,349	1.3	283,345	3.5	80,956	2.8	226,676
Motel-Out	36.5%	1,415,234	1.7	832,491	3.1	268,545	2.2	590,800
Camp-Out	4.0%	155,094	1.9	81,629	3.8	21,481	3.1	66,592
Other Overnight	10.5%	407,122	1.4	290,802	2.8	103,858	2.5	259,644
<b>Totals</b>	<b>100.0%</b>	<b>3,877,354</b>		<b>2,880,588</b>		<b>936,735</b>		<b>1,767,751</b>
<sup>a</sup> Findings from the 2009 Visitor Services Project survey results as reported in Cook, Philip S., <i>Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009</i> , February, 2011 SOURCE: As noted, with Land Economics Consultants analysis 2012								

Table 9-190 summarizes the total spending derived from the level of visitation produced by analysis of the full pattern of spending within the MGM2 model. The MGM2 model also estimates total economic activity in terms of job creation, income to workers, and value added to the four-county regional economy, as presented in table 9-191. Table 9-192 calculates the economic impacts of NPS spending.

**TABLE 9-190: ALTERNATIVE 4 — VISITOR GROUPS AND TOTAL SPENDING BY MARKET SEGMENT**

Market Segment	Visits in Party-Days/Nights	Average Spending (\$)	Total Spending in 2010 \$000s	Percent of Spending
Local-Day User	64,088	\$74.64	\$4,783	1%
Non-Local-Day User	281,989	\$86.71	\$24,451	7%
Motel-In	277,961	\$371.17	\$103,172	28%
Camp-In	226,676	\$170.02	\$38,540	10%
Motel-Out	590,800	\$312.95	\$184,893	49%
Camp-Out	66,592	\$130.81	\$8,711	2%
Other Overnight	259,644	\$37.54	\$9,747	3%
<b>Totals</b>	<b>1,767,751</b>	<b>\$211.74</b>	<b>\$374,297</b>	<b>100%</b>
SOURCE: MGM2 model built for Merced River Analysis, Land Economics Consultants 2012				

**TABLE 9-191: ALTERNATIVE 4 — TOTAL ECONOMIC ACTIVITY DUE TO VISITOR SPENDING**

Sector/Spending Category	Sales \$000s	Jobs	Labor Income \$000s	Value Added \$000s
<b>Direct Effects</b>				
Motel, hotel cabin, transient rental, or B&B	\$145,409	1,382	\$38,501	\$82,551
Camping fees	\$10,959	143	\$3,443	\$4,971
Restaurants & bars	\$62,197	1,077	\$20,888	\$33,948
Admissions & fees	\$38,810	692	\$10,419	\$23,227
Local transportation	\$23,103	486	\$11,644	\$17,682
Grocery stores	\$6,726	101	\$3,376	\$4,910
Gas stations	\$8,469	46	\$4,242	\$6,299
Other retail	\$14,627	256	\$6,747	\$10,996
Wholesale trade	\$1,482	10	\$520	\$1,102
Local Production of goods	\$185	1	\$27	\$74
<b>Total Direct Effects</b>	<b>\$311,969</b>	<b>4,194</b>	<b>\$99,806</b>	<b>\$185,761</b>
Indirect and Induced Effects	\$123,373	1,062	\$35,637	\$75,014
<b>Total Effects</b>	<b>\$435,342</b>	<b>5,256</b>	<b>\$135,443</b>	<b>\$260,775</b>
Multiplier	1.40	1.25	1.36	1.40
NOTE: Current economic impacts are measured in 2010 dollars.				
SOURCE: MGM2 model built for Merced River Alternatives Analysis, Land Economics Consultants 2012				

**TABLE 9-192: ALTERNATIVE 4 — ECONOMIC IMPACTS OF NATIONAL PARK SERVICE SPENDING**

Yosemite National Park	Direct Effects	Economic Multipliers <sup>a</sup>	Indirect and Induced Effects	Total of Direct, Indirect and Induced Effects
<b>Employment</b>				
National Park Service Jobs <sup>b</sup>	885	1.33	292	1,176
<b>Labor Income</b>				
NPS Payroll <sup>b</sup>				
Salaries \$000s	\$38,959			
Benefits \$000s	\$10,040			
Total Compensation	\$48,999	1.15	\$7,580	\$56,579
<b>Value Added</b>				
Total Compensation	\$48,999	1.29	\$14,0359	\$63,037
NOTE: Current economic impacts are measured in 2010 dollars.				
<sup>a</sup> Multipliers are from IMPLAN sector 439, federal government/nonmilitary employment and payroll.				
<sup>b</sup> As reported in Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010</i> , Natural Resource Report NPS/NRSS/EQD/NRR--2011/481.				
SOURCES: As noted; Land Economics Consultants analysis 2012				

### Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration

The difference in jobs supported under Alternative 4 and Alternative 1 is presented in **table 9-193**, with a detailed breakout by industrial sector within the four-county regional economy. Alternative 4, with its different mix of facilities and infrastructure, would support 110 fewer jobs than Alternative 1.

**TABLE 9-193: ALTERNATIVE 4 — IMPACT ON JOBS BY INDUSTRY SECTOR**

Sector/Spending Category	Jobs Under Alt. 1 (No Action)	Jobs Under Alt. 4	Difference in Jobs
<b>Direct Effects</b>			
Motel, hotel, cabin, or B&B	1,409	1,382	(26)
Camping fees	145	143	(3)
Restaurants & bars	1,098	1,077	(21)
Admissions & fees	705	692	(13)
Local transportation	495	486	(9)
Grocery stores	103	101	(2)
Gas stations	47	46	(1)
Other retail	261	256	(5)
Wholesale trade	10	10	(0)
Local Production of goods	1	1	(0)
<b>Total Direct Effects</b>	<b>4,274</b>	<b>4,194</b>	<b>(80)</b>
Indirect and Induced Effects	1,083	1,062	(20)
<b>Total Effects of Visitor Spending</b>	<b>5,357</b>	<b>5,256</b>	<b>(100)</b>
<b>National Park Service Total Employment Effects</b>	<b>1,186</b>	<b>1,176</b>	<b>(10)</b>
<b>Total Job Creation in Four Counties</b>	<b>6,543</b>	<b>6,433</b>	<b>(110)</b>
SOURCE: MGM2 model, Land Economics Consultants 2012			

As described for other alternatives, the adverse impacts of Alternative 4 might not be as intense as indicated by the job reduction calculated above due to substitution and time-shift effects. In the context of total employment within the four-county region, the reduction in jobs resulting from Alternative 4 would be a long-term, adverse impact, but it would be negligible in intensity (see **table 9-194**).

For specific industry sectors within the four-county region, however, the job reduction would be more significant in terms of percentage changes within each sector. In the lodging industry, the reduction in jobs resulting from Alternative 4 would be a long-term, negligible, adverse impact. As noted previously, to the extent that hotel and motel occupancies increase in gateway communities as a result of the Alternative 4 reduction in Yosemite Valley accommodations, some or all of the adverse impact could be mitigated. Similarly, to the extent that overnight visitors to the Valley are displaced but shift their visits to a different time, the adverse impact could be mitigated.

**TABLE 9-194: ALTERNATIVE 4 — CHARACTERIZATION OF IMPACT SIGNIFICANCE**

Industry Sector	Total Jobs in 4-County Region	Alt. 4: Net Impact on Jobs	Impact as % of Total	Characterization of Impact Significance	
<b>Total Impacts (including Indirect &amp; Induced Effects)</b>	<b>102,273</b>	<b>(110)</b>	<b>-0.1%</b>	Negligible	Adverse
<b>Direct Impacts on Specific Sectors<sup>a</sup></b>					
Agriculture	13,619	0	0.0%	No Impact	
Mining	310	0	0.0%	No Impact	
Construction	5,115	0	0.0%	No Impact	
Manufacturing	4,043	0	0.0%	No Impact	
Transportation (and Public Utilities)	2,074	(9)	-0.4%	Negligible	Adverse
Retail Stores (and Wholesale Trade)	10,314	(8)	-0.1%	Negligible	Adverse
Lodging Industry	3,637	(29)	-0.8%	Negligible	Adverse
Restaurants and Bars	5,887	(21)	-0.3%	Negligible	Adverse
All Other Service Industries	36,446	(13)	0.0%	Negligible	Adverse
Government (Local, State, & Fed.)	20,828	(10)	0.0%	Negligible	Adverse
<sup>a</sup> Indirect and induced effects would be spread throughout the economy and would have a negligible impact. SOURCE: Minnesota IMPLAN Group, Inc. data; Land Economics Consultants analysis 2012					

In the Restaurant and Bar sector of the regional economy, the long-term, adverse impact on jobs would also be negligible in intensity. The intensity could be reduced by substitution and time-shift effects that maintain volumes of visitors and spending.

Within the four-county regional economy, the single business in the lodging and restaurant sectors most affected by Alternative 4 would be the concessioner within the park. This would also constitute the one impact felt in the local context of the park, and a 20% reduction in lodging would no doubt be seen as a noticeable adverse impact by the existing concessioner. In the long term, however, a new concession agreement would result from the issuance of a Contract Prospectus describing the business opportunity offered under the CMP. Prior to issuing a Prospectus to the public, the NPS must determine that a financially feasible business opportunity exists that would mitigate this local impact by realigning the financial performance expectations of the concessioner with the new opportunity for commercial visitor service in the park.

In the Transportation sector of the regional economy, the long-term, adverse impact on jobs would be negligible in intensity. Note, however, that in addition to the potential mitigating substitution and time-shift effects, the more intensive transportation management efforts under Alternative 4 might require additional staffing for regional public transportation systems and for traffic and parking management in the park.

Just as impacts are felt with different intensities in different sectors of the economy, intensities of impacts would also vary geographically within the four-county regional economy. In the smaller counties of Mariposa and Mono, where the leisure and hospitality sector comprises a third to half of all jobs, impacts derived from visitor spending would be more noticeable than in the larger and more diversified economies of Madera and Tuolumne counties. Within counties, gateway communities

would experience impacts more intensely than larger and more distant cities that have more diversity in their economic support.

Mariposa County, and the gateway community of Mariposa within it, is likely to be the most noticeably impacted geographic areas because they combine both dependency on tourism industry spending and proximity to the park. There is also a fiscal connection in that the concessioner lodging in Yosemite Valley lies within Mariposa County, which receives the transient occupancy tax revenue collected there. El Portal Administrative Site falls within Mariposa County. Mariposa is further impacted because it is the closest place for park and concessioner employees to live who do not have housing within the park. Changes in the park workforce living in Mariposa County could cause increases or decreases in demand for county services and affect county revenues. Changes in park workforce could also change school enrollment, affecting both costs and revenues for local schools.

The maximum fiscal impact of Alternative 4 on Mariposa County could include a reduction of \$173,000 in TOT revenue, based on the 10% tax rate and the difference in spending between Alternatives 1 and 4 for all types of lodging, both inside and outside the park. This would be equivalent to a 0.4% reduction in General Fund revenue for the county.

### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

#### ***Past Actions***

Past actions would affect Alternative 4 to the same degree they affect Alternative 1 for socioeconomic impacts.

#### ***Present Actions***

Present actions would affect Alternative 4 to the same degree they affect Alternative 1 for socioeconomic impacts.

#### ***Reasonably Foreseeable Future Actions***

For socioeconomic impacts, the cumulatively considerable factors would be the same as those described for Alternative 1. These would include the effects of private decisions made in the gateway communities and elsewhere in the four-county region, as well as those of public decisions in the region and within the park. Over the long run, one of the most functional features of market economies is that they trend towards self-correction. If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may build to the point that private interests may expand supply in surrounding areas by developing additional lodging, restaurants, and other facilities. These effects are likely to be strongest in areas closest to the park, and due to its proximity Mariposa County could be a beneficiary of this additional market demand. Specific present actions that could facilitate the capture of additional development include

- *Mariposa County General Plan Housing Element Update*
- *Mariposa County General Plan (Update)*



Short of new construction, additional demand may be satisfied by increasing hours and seasons of operations, adding additional staff, and other business operating responses to expand capacities in gateway communities. In the short run, management policies within the park can alter the flow of visitors and shift the mix of overnight and day visitors, but in the long run market adaptations can continue to increase the annual volumes of people visiting the park. Based on these considerations, the cumulative economic impact of past, present, and reasonably foreseeable future actions, when combined with those of Alternative 4, would be regional, long term, negligible, and adverse.

#### **Irreversible and Irretrievable Commitment of Resources for Alternative 4**

For the most part, socioeconomic actions are reversible in the sense that markets adapt to changing circumstances and public policies can change strategies over time. On the other hand, the implementation of Alternative 4 would require the one-time expenditure of approximately \$168 million. Once expended, those financial resources would no longer be available for other possible uses, and relatively permanent changes to facilities and infrastructure in the park would have been made. Physical changes made under Alternative 4 may be reversed in the future, but additional financial resources would be required to do so.

#### **Relationship of Short-Term Uses and Long-Term Productivity for Alternative 4**

Construction and restoration projects to implement Alternative 4 would create short-term disruptions during construction, but would produce desired changes to the park over the long term.

There would also be a short-term, one-time change to the business model for the concessioner in the park, with a new concession agreement put in place to be consistent with the objectives and scale of facilities produced under Alternative 4. In the long term, a new pattern of economic flows in the region would be likely to emerge that would supply visitor services to meet the new level of visitor demand.

### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Manage Visitor Use and Facilities***

Compared with Alternative 1 (No Action), Alternative 5 would create slightly more lodging units in the park, approximately 2% more. The camping unit inventory in Yosemite Valley would grow more substantially, by approximately 37%. Peak day-use infrastructure in the Valley, on the other hand, would be reduced by approximately 11%. As a result, and as discussed in the “Environmental Consequences Methodology” section above, the scenario for total annual visitation under Alternative 5 maintains the level generally experienced today, approximately 3.95 million visitors per year. Table 9-195 applies results of the VSP survey findings to translate that total annual visitation estimate into visitor groups by market segment, which is necessary for input to the economic models.

**TABLE 9-195: ALTERNATIVE 5 — ANALYSIS OF TOTAL VISITATION BY MARKET SEGMENT**

Visitor Market Segment	Visitor Market Segment Share of Park Entries <sup>a</sup>	Calculated Distribution of Visitors	Re-Entry Rate <sup>a</sup>	Visitor Trips to the Park	Ave. Group Size <sup>a</sup>	Visitor Groups	Length of Stay (Nights or Days) <sup>a</sup>	Visits in Party-Days / Nights
<b>Total Visitors: Alt. 5</b>	<b>3,948,695</b>							
Local-Day User	4.0%	157,948	1.1	143,589	2.2	65,268	1.0	65,268
Non-Local-Day User	24.0%	947,687	1.1	861,533	3.0	287,178	1.0	287,178
Motel-In	11.5%	454,100	1.1	412,818	3.5	117,948	2.4	283,075
Camp-In	9.5%	375,126	1.3	288,558	3.5	82,445	2.8	230,847
Motel-Out	36.5%	1,441,274	1.7	847,808	3.1	273,486	2.2	601,670
Camp-Out	4.0%	157,948	1.9	83,130	3.8	21,876	3.1	67,817
Other Overnight	10.5%	414,613	1.4	296,152	2.8	105,769	2.5	264,422
<b>Totals</b>	<b>100.0%</b>	<b>3,948,695</b>		<b>2,933,590</b>		<b>953,970</b>		<b>1,800,276</b>
<sup>a</sup> Findings from the 2009 Visitor Services Project survey results as reported in Cook, Philip S., Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009, " February, 2011								
SOURCE: As noted, with Land Economics Consultants analysis 2012								

Table 9-196 summarizes total spending derived from this level of visitation produced by analysis of the full pattern of spending within the MGM2 model. The MGM2 model also estimates total economic activity in terms of job creation, income to workers, and value added to the four-county regional economy, as presented in table 9-197. Table 9-198 calculates the economic impacts of NPS spending.

**TABLE 9-196: ALTERNATIVE 5 — VISITOR GROUPS AND TOTAL SPENDING BY MARKET SEGMENT**

Market Segment	Visits in Party-Days/Nights	Average Spending (\$)	Total Spending in 2010 \$000s	Percent of Spending
Local-Day User	65,268	\$74.64	\$4,871	1%
Non-Local-Day User	287,178	\$86.71	\$24,900	7%
Motel-In	283,075	\$371.17	\$105,070	28%
Camp-In	230,847	\$170.02	\$39,249	10%
Motel-Out	601,670	\$312.95	\$188,295	49%
Camp-Out	67,817	\$130.81	\$8,871	2%
Other Overnight	264,422	\$37.54	\$9,927	3%
<b>Totals</b>	<b>1,800,276</b>	<b>\$211.74</b>	<b>\$381,184</b>	<b>100%</b>
SOURCE: MGM2 model built for Merced River Analysis, Land Economics Consultants 2012				

**TABLE 9-197: ALTERNATIVE 5 — TOTAL ECONOMIC ACTIVITY DUE TO VISITOR SPENDING**

Sector/Spending Category	Sales \$000s	Jobs	Labor Income \$000s	Value Added \$000s
<b>Direct Effects</b>				
Motel, hotel cabin, transient rental, or B&B	\$148,085	1,408	\$39,209	\$84,070
Camping fees	\$11,160	145	\$3,506	\$5,062
Restaurants & bars	\$63,341	1,097	\$21,272	\$34,573
Admissions & fees	\$39,524	704	\$10,610	\$23,655
Local transportation	\$23,528	494	\$11,858	\$18,007
Grocery stores	\$6,850	103	\$3,438	\$5,001
Gas stations	\$8,625	47	\$4,320	\$6,415
Other retail	\$14,897	261	\$6,871	\$11,199
Wholesale trade	\$1,509	10	\$529	\$1,122
Local Production of goods	\$189	1	\$27	\$75
<b>Total Direct Effects</b>	<b>\$317,709</b>	<b>4,271</b>	<b>\$101,643</b>	<b>\$189,179</b>
Indirect and Induced Effects	\$125,643	1,082	\$36,293	\$76,394
<b>Total Effects</b>	<b>\$443,352</b>	<b>5,353</b>	<b>\$137,935</b>	<b>\$265,573</b>
Multiplier	1.40	1.25	1.36	1.40
NOTE: Current economic impacts are measured in 2010 dollars.				
SOURCE: MGM2 model built for Merced River Alternatives Analysis, Land Economics MISSING Consultants 2012				

**TABLE 9-198: ALTERNATIVE 5 — ECONOMIC IMPACTS OF NATIONAL PARK SERVICE SPENDING**

Yosemite National Park	Direct Effects	Economic Multipliers <sup>a</sup>	Indirect and Induced Effects	Total of Direct, Indirect and Induced Effects
<b>Employment</b>				
National Park Service Jobs <sup>b</sup>	892	1.33	294	1,186
<b>Labor Income</b>				
NPS Payroll <sup>b</sup>				
Salaries \$000s	\$39,271			
Benefits \$000s	\$10,120			
Total Compensation	\$49,391	1.15	\$7,641	\$57,032
<b>Value Added</b>				
Total Compensation	\$49,391	1.29	\$14,151	\$63,542
NOTE: Current economic impacts are measured in 2010 dollars.				
<sup>a</sup> Multipliers are from IMPLAN sector 439, federal government/nonmilitary employment and payroll.				
<sup>b</sup> As reported in Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010</i> , Natural Resource Report NPS/NRSS/EQD/NRR--2011/481.				
SOURCES: As noted; Land Economics Consultants analysis 2012				

### Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration

The difference in jobs supported under Alternative 5 and Alternative 1 is presented in **table 9-199**, with a detailed breakout by industrial sector within the four-county regional economy. Alternative 5 would be essentially the same as Alternative 1 in terms of jobs; it would support the equivalent of four fewer jobs than Alternative 1.

**TABLE 9-199: ALTERNATIVE 5 — IMPACT ON JOBS BY INDUSTRY SECTOR**

Sector/Spending Category	Jobs Under Alt. 1 (No Action)	Jobs Under Alt. 5	Difference in Jobs
<b>Direct Effects</b>			
Motel, hotel, cabin, or B&B	1,409	1,408	(1)
Camping fees	145	145	(0)
Restaurants & bars	1,098	1,097	(1)
Admissions & fees	705	704	(0)
Local transportation	495	494	(0)
Grocery stores	103	103	(0)
Gas stations	47	47	(0)
Other retail	261	261	(0)
Wholesale trade	10	10	(0)
Local Production of goods	1	1	(0)
<b>Total Direct Effects</b>	<b>4,274</b>	<b>4,271</b>	<b>(3)</b>
Indirect and Induced Effects	1,083	1,082	(1)
<b>Total Effects of Visitor Spending</b>	<b>5,357</b>	<b>5,353</b>	<b>(4)</b>
<b>National Park Service Total Employment Effects</b>	<b>1,186</b>	<b>1,186</b>	<b>(0)</b>
<b>Total Job Creation in Four Counties</b>	<b>6,543</b>	<b>6,539</b>	<b>(4)</b>
SOURCE: MGM2 model, Land Economics Consultants 2012			

The long-term, regional, adverse impacts of Alternative 5 would be negligible. In the context of total employment within the four-county region, the support for jobs resulting from Alternative 5 would be almost the same as from Alternative 1 (see **table 9-200**). In the context of specific industry sectors within the four-county region, the long-term economic impacts would be slightly adverse but would also be negligible.

### Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration

#### *Past Actions*

Past actions would affect Alternative 5 to the same degree they affect Alternative 1 for socioeconomic impacts.

**TABLE 9-200: ALTERNATIVE 5 — CHARACTERIZATION OF IMPACT SIGNIFICANCE**

Industry Sector	Total Jobs in the 4-County Region	Alt. 5: Net Impact on Jobs	Impact as % of Total	Characterization of Impact Significance	
Total Impacts (including Indirect & Induced Effects)	102,273	(4)	-0.0%	Negligible	Adverse
Direct Impacts on Specific Sectors <sup>a</sup>					
Agriculture	13,619	0	0.0%	No Impact	
Mining	310	0	0.0%	No Impact	
Construction	5,115	0	0.0%	No Impact	
Manufacturing	4,043	0	0.0%	No Impact	
Transportation (and Public Utilities)	2,074	(0)	0.0%	No Impact	
Retail Stores (and Wholesale Trade)	10,314	(0)	0.0%	No Impact	
Lodging Industry	3,637	(1)	0.0%	Negligible	Adverse
Restaurants and Bars	5,887	(1)	0.0%	Negligible	Adverse
All Other Service Industries	36,446	(0)	0.0%	No Impact	
Government (Local, State, & Fed.)	20,828	(0)	0.0%	No Impact	
<sup>a</sup> Indirect and induced effects would be spread throughout all sectors of the economy and would have a negligible impact. SOURCE: Minnesota IMPLAN Group, Inc. data; Land Economics Consultants 2012					

### *Present Actions*

Present actions would affect Alternative 5 to the same degree they affect Alternative 1 for socioeconomic impacts.

### *Reasonably Foreseeable Future Actions*

For socioeconomic impacts, the cumulatively considerable factors would be the same as those described above for alternative 1. These will include the effects of private decisions made in the gateway communities and elsewhere in the four-county region, as well as those of public decisions in the region and within the park. Over the long run, one of the most functional features of market economies is that they trend toward self-correction. If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may build to the point that private interests may expand supply in surrounding areas by developing additional lodging, restaurants, and other facilities. Short of new construction, additional demand may be satisfied by increasing hours and seasons of operations, adding additional staff, and other business operating responses to expand capacities in gateway communities. In the short run, management policies within the park can alter the flow of visitors and shift the mix of overnight and day visitors, but in the long run market adaptations can continue to increase the annual volumes of people visiting the park. Based on these considerations, the cumulative economic impact of past, present, and reasonably foreseeable future actions, when combined with those of Alternative 5, would be regional, long term, negligible, and adverse.

### **Irreversible and Irretrievable Commitment of Resources for Alternative 5**

For the most part, socioeconomic actions are reversible in the sense that markets adapt to changing circumstances and public policies can change strategies over time. On the other hand, the implementation of Alternative 5 would require the one-time expenditure of approximately \$183 million. Once expended, those financial resources would no longer be available for other possible uses, and relatively permanent changes to facilities and infrastructure in the park would have been made. Physical changes made for Alternative 5 may be reversed in the future, but additional financial resources would be required to do so.

### **Relationship of Short-Term Uses and Long-Term Productivity for Alternative 5**

Construction and restoration projects to implement Alternative 5 would create short-term disruptions during construction, but would produce desired changes to the park over the long term. There would also be a short-term, one-time change to the business model for the concessioner in the park, with a new concession agreement put in place to be consistent with the objectives and scale of facilities produced under Alternative 5. In the long term, a new pattern of economic flows in the region would be likely to emerge that supplies visitor services to meet the new level of visitor demand.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **All River Segments**

#### ***Impacts of Actions to Manage Visitor Use and Facilities***

Compared with Alternative 1 (No Action), Alternative 6 would create the largest increase in the number of lodging units in the park, growing by approximately 20%. The camping unit inventory in Yosemite Valley would grow even more proportionately, by approximately 59%. Peak day-use infrastructure in the Valley, on the other hand, would be reduced by approximately 5%. As a result of these actions, the total annual visitor handling facilities and infrastructure of Alternative 6 would be approximately 7% larger than today. This would allow growth to continue at an assumed 3% average rate for another two years before the daily maximum number of visitors would start to be reached on peak days as was described in the methodology section. At that point the annual visitor volume would be approximately 4.19 million. **Table 9-201** applies results of the VSP survey findings to translate that total annual visitation estimate into visitor groups by market segment, which is necessary for input to the economic models.

**TABLE 9-201: ALTERNATIVE 6 — ANALYSIS OF TOTAL VISITATION BY MARKET SEGMENT**

Visitor Market Segment	Visitor Market Segment Share of Park Entries <sup>a</sup>	Calculated Distribution of Visitors	Re-Entry Rate <sup>a</sup>	Visitor Trips to the Park	Ave. Group Size <sup>a</sup>	Visitor Groups	Length of Stay (Nights or Days) <sup>a</sup>	Visits in Party-Days / Nights
<b>Total Visitors: Alt. 6</b>	<b>4,190,917</b>							
Local-Day User	4.0%	167,637	1.1	152,397	2.2	69,271	1.0	69,271
Non-Local-Day User	24.0%	1,005,820	1.1	914,382	3.0	304,794	1.0	304,794
Motel-In	11.5%	481,955	1.1	438,141	3.5	125,183	2.4	300,440
Camp-In	9.5%	398,137	1.3	306,259	3.5	87,503	2.8	245,007
Motel-Out	36.5%	1,529,685	1.7	899,814	3.1	290,263	2.2	638,578
Camp-Out	4.0%	167,637	1.9	88,230	3.8	23,218	3.1	71,977
Other Overnight	10.5%	440,046	1.4	314,319	2.8	112,257	2.5	280,642
<b>Totals</b>	<b>100.0%</b>	<b>4,190,917</b>		<b>3,113,543</b>		<b>1,012,489</b>		<b>1,910,709</b>
<sup>a</sup> Findings from the 2009 Visitor Services Project survey results as reported in Cook, Philip S., <i>Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2009</i> , February, 2011 SOURCE: As noted, with Land Economics Consultants 2012								

Table 9-202 summarizes total spending derived from the level of visitation produced by analysis of the full pattern of spending within the MGM2 model. The MGM2 model also estimates total economic activity in terms of job creation, income to workers, and value added to the four-county regional economy, as presented in table 9-203. Table 9-204 calculates the economic impacts of NPS spending.

**TABLE 9-202: ALTERNATIVE 6 — VISITOR GROUPS AND TOTAL SPENDING BY MARKET SEGMENT**

Market Segment	Visits in Party-Days/Nights	Average Spending (\$)	Total Spending in 2010 \$000s	Percent of Spending
Local-Day User	69,271	\$74.64	\$5,170	1%
Non-Local-Day User	304,794	\$86.71	\$26,428	7%
Motel-In	300,440	\$371.17	\$111,516	28%
Camp-In	245,007	\$170.02	\$41,657	10%
Motel-Out	638,578	\$312.95	\$199,845	49%
Camp-Out	71,977	\$130.81	\$9,415	2%
Other Overnight	280,642	\$37.54	\$10,536	3%
<b>Totals</b>	<b>1,910,709</b>	<b>\$211.74</b>	<b>\$404,567</b>	<b>100%</b>
SOURCE: MGM2 model built for Merced River Analysis, Land Economics Consultants 2012				

**TABLE 9-203: ALTERNATIVE 6 — TOTAL ECONOMIC ACTIVITY DUE TO VISITOR SPENDING**

Sector/Spending Category	Sales \$000s	Jobs	Labor Income \$000s	Value Added \$000s
<b>Direct Effects</b>				
Motel, hotel, cabin, or B&B	\$157,169	1,494	\$41,615	\$89,227
Camping fees	\$11,845	154	\$3,721	\$5,373
Restaurants & bars	\$67,227	1,164	\$22,577	\$36,693
Admissions & fees	\$41,949	748	\$11,261	\$25,106
Local transportation	\$24,972	525	\$12,586	\$19,112
Grocery stores	\$7,270	109	\$3,649	\$5,308
Gas stations	\$9,154	50	\$4,585	\$6,809
Other retail	\$15,810	277	\$7,293	\$11,886
Wholesale trade	\$1,602	11	\$562	\$1,191
Local Production of goods	\$200	1	\$29	\$80
<b>Total Direct Effects</b>	<b>\$337,198</b>	<b>4,533</b>	<b>\$107,878</b>	<b>\$200,783</b>
Indirect and Induced Effects	\$133,350	1,148	\$38,519	\$81,081
<b>Total Effects</b>	<b>\$470,548</b>	<b>5,682</b>	<b>\$146,396</b>	<b>\$281,864</b>
Multiplier	1.40	1.25	1.36	1.40
NOTE: Current economic impacts are measured in 2010 dollars.				
SOURCE: MGM2 model built for Merced River Alternatives Analysis, Land Economics Consultants 2012				

**TABLE 9-204: ALTERNATIVE 6 — ECONOMIC IMPACTS OF NATIONAL PARK SERVICE SPENDING**

Yosemite National Park	Direct Effects	Economic Multipliers <sup>a</sup>	Indirect and Induced Effects	Total of Direct, Indirect and Induced Effects
<b>Employment</b>				
National Park Service Jobs <sup>b</sup>	916	1.33	302	1,218
<b>Labor Income</b>				
NPS Payroll <sup>b</sup>				
Salaries \$000s	\$40,331			
Benefits \$000s	\$10,393			
Total Compensation	\$50,724	1.15	\$7,847	\$58,571
<b>Value Added</b>				
Total Compensation	\$50,724	1.29	\$14,533	\$65,257
NOTE: Current economic impacts are measured in 2010 dollars.				
<sup>a</sup> Multipliers are from IMPLAN sector 439, federal government/nonmilitary employment and payroll.				
<sup>b</sup> As reported in Stynes, D.J., <i>Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010</i> , Natural Resource Report NPS/NRSS/EQD/NRR--2011/481.				
SOURCES: As noted; Land Economics Consultants 2012				



## Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

The difference in jobs supported under Alternative 6 and Alternative 1 is presented in **table 9-205**, with a detailed breakout by industrial sector within the four-county regional economy. Alternative 6 would support approximately 356 more jobs than Alternative 1

**TABLE 9-205: ALTERNATIVE 6 — IMPACT ON JOBS BY INDUSTRY SECTOR**

Sector/Spending Category	Jobs Under Alt. 1	Jobs Under Alt. 6	Difference in Jobs
<b>Direct Effects</b>			
Motel, hotel cabin, transient rental, or B&B	1,409	1,494	85
Camping fees	145	154	9
Restaurants & bars	1,098	1,164	67
Admissions & fees	705	748	43
Local transportation	495	525	30
Grocery stores	103	109	6
Gas stations	47	50	3
Other retail	261	277	16
Wholesale trade	10	11	1
Local Production of goods	1	1	0
<b>Total Direct Effects</b>	<b>4,274</b>	<b>4,533</b>	<b>259</b>
Indirect and Induced Effects	1,083	1,148	66
<b>Total Effects of Visitor Spending</b>	<b>5,357</b>	<b>5,682</b>	<b>325</b>
<b>National Park Service Total Employment Effects</b>	<b>1,186</b>	<b>1,218</b>	<b>32</b>
<b>Total Job Creation in Four Counties</b>	<b>6,543</b>	<b>6,899</b>	<b>356</b>
SOURCE: MGM2 model, Land Economics Consultants 2012			

The long-term, regional socioeconomic impacts of Alternative 6 would be beneficial, but they would also be negligible. In the context of total employment within the four-county region, the support for jobs resulting from Alternative 6 would be approximately 0.3% larger than Alternative 1 and well within the 0-2.5% categorization for negligible (see **table 9-206**). For specific industry sectors within the four-county region, the beneficial socioeconomic impacts would also be negligible, except in the lodging industry sector where the long-term, regional, beneficial impacts would be minor in intensity.

As was discussed under the other action alternatives, Mariposa County, and the gateway community of Mariposa within it, are likely to be the most noticeably impacted geographic areas because they combine both dependency on tourism industry spending and proximity to the park. There is also a fiscal connection in that the concessioner lodging in Yosemite Valley lies within Mariposa County, which receives the transient occupancy tax revenue collected there. Mariposa is further impacted because it is the closest place for park and concessioner employees to live who do not have housing

**TABLE 9-206: ALTERNATIVE 6 — CHARACTERIZATION OF IMPACT SIGNIFICANCE**

Industry Sector	Total Jobs in the 4-County Region	Alt. 6: Net Impact on Jobs	Impact as % of Total	Characterization of Impact Significance	
<b>Total Impacts (including Indirect &amp; Induced Effects)</b>	<b>102,273</b>	<b>356</b>	<b>0.3%</b>	Negligible	Beneficial
<b>Direct Impacts on Specific Sectors<sup>a</sup></b>					
Agriculture	13,619	0	0.0%	No Impact	
Mining	310	0	0.0%	No Impact	
Construction	5,115	0	0.0%	No Impact	
Manufacturing	4,043	0	0.0%	No Impact	
Transportation (and Public Utilities)	2,074	30	1.4%	Negligible	Beneficial
Retail Stores (and Wholesale Trade)	10,314	26	0.2%	Negligible	Beneficial
Lodging Industry	3,637	94	2.6%	Minor	Beneficial
Restaurants and Bars	5,887	67	1.1%	Negligible	Beneficial
All Other Service Industries	36,446	43	0.1%	Negligible	Beneficial
Government (Local, State, & Fed.)	20,828	32	0.2%	Negligible	Beneficial
<sup>a</sup> Indirect and induced effects would be spread throughout all sectors of the economy and would have a negligible impact. SOURCE: Minnesota IMPLAN Group, Inc. data; Land Economics Consultants 2012					

within the park. Changes in the park workforce living in Mariposa County could cause increases or decreases in demand for county services and affect county revenues. Changes in park workforce could also change school enrollment, affecting both costs and revenues for local schools.

The maximum fiscal impact of Alternative 6 on Mariposa County could include an additional \$560,000 in TOT revenue after two additional years of growth in visitation to the park, and based on the 10% tax rate and the difference in spending between Alternatives 1 and 6 for all types of lodging, both inside and outside the park. This would be equivalent to a 1.3% increase in General Fund revenue for the county.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

#### ***Past Actions***

Past actions would affect Alternative 6 to the same degree they affect Alternative 1 for socioeconomic impacts.

#### ***Present Actions***

Present actions would affect Alternative 6 to the same degree they affect Alternative 1 for socioeconomic impacts.

### ***Reasonably Foreseeable Future Actions***

For socioeconomic impacts, the cumulatively considerable factors would be the same as those described above for Alternative 1. These will include the effects of private decisions made in the gateway communities and elsewhere in the four-county region, as well as those of public decisions within the park. Over the long run, one of the most functional features of market economies is that they trend toward self-correction. If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may build to the point that private interests may expand supply in surrounding areas by developing additional lodging, restaurants, and other facilities. Short of new construction, additional demand may be satisfied by increasing hours and seasons of operations, adding additional staff, and other business operating responses to expand capacities in gateway communities. In the short run, management policies within the park can alter the flow of visitors and shift the mix of overnight and day visitors, but in the long run market adaptations can continue to increase the annual volumes of people visiting the park. Based on these considerations, the cumulative economic impact of past, present, and reasonably foreseeable future actions, when combined with those of Alternative 6, would be regional, long term, negligible, and beneficial.

### **Irreversible and Irretrievable Commitment of Resources for Alternative 6**

For the most part, socioeconomic actions are reversible in the sense that markets adapt to changing circumstances and public policies can change strategies over time. On the other hand, the implementation of Alternative 6 would require the one-time expenditure of approximately \$259 million. Once expended those financial resources would no longer be available for other possible uses, and relatively permanent changes to facilities and infrastructure in the park would have been made. Physical changes made for Alternative 6 may be reversed in the future, but additional financial resources would be required to do so.

### **Relationship of Short-Term Uses and Long-Term Productivity for Alternative 6**

Construction and restoration projects to implement Alternative 6 would create short-term disruptions during construction, but would produce desired changes to the park over the long term. There would also be a short-term, one-time change to the business model for the concessioner in the park, with a new concession agreement put in place to be consistent with the objectives and scale of facilities produced by Alternative 6. In the long term, a new pattern of economic flows in the region is likely to emerge that supplies visitor services to meet the new level of visitor demand.

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## HISTORIC PROPERTIES

### Historic Buildings, Structures, and Cultural Landscapes

Comprehensive investigations of historic sites, structures, and cultural landscape resources have been undertaken for Yosemite Valley and El Portal. For other areas, information is taken from overview documents (e.g., Greene 1987) and specific inventories (e.g., the Wilderness Historic Resource Surveys). The types of resources potentially affected by the Merced River Plan include districts, buildings, structures, and landscapes listed in the National Register of Historic Places (NRHP, or National Register) or designated as National Historic Landmarks. These resource types are described below.

- **Districts.** A district is a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history (36 CFR 60.3).
- **Buildings.** A building is a structure created to shelter any form of human activity, such as a house, barn, church, hotel, or similar structure. Building may refer to a historically related complex such as a courthouse and jail or a house and barn (36 CFR 60.3).
- **Structures.** A structure is a work made up of interdependent and interrelated parts in a definite pattern of organization. Constructed by man, it is often an engineering project large in scale (examples are historic trails, bridges, road systems, etc.) (36 CFR 60.3).
- **Cultural Landscapes.** Cultural landscapes are a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. Cultural landscapes are the result of the long interaction between people and the land, and the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by historical land use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past, a visual chronicle of its history. The dynamic nature of modern human life contributes to the continual reshaping of cultural landscapes, making them a good source of information about specific times and places but at the same time rendering their long-term preservation a challenge (NPS *Management Policies* 2006).

**National Historic Landmarks.** National Historic Landmarks (NHL) are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. Designation as an NHL affords a property additional protection as the federal government is tasked with avoiding or minimizing any potential adverse effects to the landmark, and monitoring the condition of the property (36 CFR 65)

**National Register of Historic Places Eligibility Criteria.** The criteria of the NRHP provide the basis under which a structure, site, building, district, or object can be considered significant for listing on the National Register. A potential resource needs to meet only one of the four criteria to achieve significance. The criteria include resources that (36 CFR 60.4):

- (A) are associated with events that have made a significant contribution to the broad patterns of history; or
- (B) are associated with the lives of persons significant in our past; or
- (C) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) have yielded or may likely yield information important in prehistory or history.

## ***Affected Environment***

### **Regulations and Policies**

*Section 106 of National Historic Preservation Act 1966 (as amended).* Section 106 of the National Historic Preservation Act of 1966 (NHPA) (16 USC 470) directs federal agencies to take into account the effects of any undertaking on properties listed in or eligible for listing in the NRHP. The Advisory Council on Historic Preservation (ACHP) has developed implementing regulations (36 CFR 800), which allow agencies to develop agreements for consideration of these historic properties.

*2008 Programmatic Agreement.* The servicewide 2008 programmatic agreement provides coordination between the NPS, ACHP, and National Conference of SHPOs for the section 106 compliance process. The NHPA, 36 CFR 800, and the 2008 programmatic agreement provide the NPS with a roadmap to plan for and carry out undertakings to minimize harm to cultural resources.

*Proposed Merced River Plan Programmatic Agreement.* As a part of the current Merced Wild and Scenic River Comprehensive Management Plan, the Park is proposing, via consultation with the ACHP, SHPO, and traditionally associated American Indian tribes and groups, the development of a programmatic agreement regarding treatment of historic resources under the proposed management plan (Merced River Plan PA) (36 CFR 800.14). Based on the long term nature of plan implementation, a plan specific programmatic agreement will assist in guiding actions in order to avoid or minimize adverse effects to historic resources. This document, while not yet finalized, will provide guidance for the identification, evaluation, treatment, and mitigation of adverse effects for actions affecting historic resources, including potentially eligible historic resources, impacted by the Merced River Plan. A process for identifying and implementing appropriate mitigations measures will be developed through the programmatic agreement. In the event that the programmatic agreement is not completed prior to project initiation, actions will proceed under the guidance of the standard 36 CFR part 800 consultation process.

*Secretary of the Interior's Standards for the Treatment of Historic Properties.* The Secretary of the Interior's Standards for Treatment of Historic Properties (Standards for Treatment of Historic Properties) are prepared under the authority of NHPA Sections 101(f) (g), and (h), and NHPA Section 110 and are intended to promote responsible preservation practices that help protect irreplaceable cultural resources. The Standards for Treatment of Historic Properties are not intended to make decisions about which features of a historic building should be saved and those features that

may be changed; rather, when a treatment is selected, they provide guidance for consistency in the proposed work.

The four treatment approaches are preservation, rehabilitation, restoration, and reconstruction. Preservation places a high premium on the retention of all historic fabric through conservation, maintenance, and repair. Rehabilitation emphasizes the retention and repair of historic materials, but more latitude is provided for replacement because it is intended to provide a compatible use for a property (when the use for which it was originally built is no longer practical or feasible) through repair, alterations or additions. Restoration focuses on the retention of materials from the most significant time in a property's history, while permitting the removal of materials from other periods. Reconstruction establishes limited opportunities to re-create a nonsurviving site, landscape, building, structure, or object in all new materials (Weeks 2001).

*NPS Management Policies 2006.* The *NPS Management Policies 2006* also provide direction regarding the management and preservation of historic properties. In accordance with these policies, the NPS is committed to protecting cultural resources against theft, fire, vandalism, overuse, deterioration, environmental impacts, and other threats without compromising the integrity of the resources. The *NPS Management Policies 2006* also provide guidance on procedures for protection and maintenance of historic properties under lease, among other instruction.

*Director's Order 28-Cultural Resources Management Guideline (1998).* Director's Order-28 guides the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the *NPS Management Policies*. It also ensures that the NPS comply with the substantive and procedural requirements described in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. Additionally, the NPS would comply with the 2008 programmatic agreement with the ACHP on Historic Preservation and the National Conference of SHPOs.

*Yosemite National Park General Management Plan (1980).* The *Yosemite General Management Plan* calls for a reduction in traffic congestion, removal of nonessential buildings and facilities, restoration of large areas of the Valley to their natural conditions, and relocation of visitor and employee accommodations away from environmentally sensitive or dangerous areas.

*Cultural Resources Management Plan (1973).* The *Cultural Resources Management Plan* completed for the *Yosemite General Management Plan* was designed to protect the significant cultural resources of the park through compliance with all cultural resource legislative, executive, and regulatory requirements. The CRMP provides specific policies to guide cultural resources management at Yosemite, including consultation, survey and evaluation, preservation/restoration/reuse, and documentation.

*Concession Services Plan (1992).* The *Concession Services Plan*, which is a 1992 amendment to the *Yosemite General Management Plan*, guides the management of concession enterprises, such as lodging, food, retail, and other commercial services in Yosemite. This plan serves as the basis for contracts between the NPS and the park's primary concessioner.

## Scope of the Analysis

### *Historical Context*

Arguably, the earliest record of non-indigenous presence in Yosemite was Joseph Rutherford Walker's 1833 exploratory party that crossed the Sierra Nevada from east to west, along the divide between the Tuolumne River and Merced River drainages. Walker's party may have been the first non-Indians to see Yosemite Valley. Prior to the 1850s, the U. S. military, which had increased its presence in the Central Valley, responded to raids by local American Indian tribes and conducted the 1851 relocation of the Ahwahnechees, led by Chief Tenaya, to the Fresno River Reservation (Greene 1987). The California Gold Rush, the single largest migration in human history, had profound impacts on the land, people and resources in the Sierra Nevada foothills. This event triggered massive disruption of native cultures and lifeways, brought thousands of people to the lands immediately surrounding Yosemite, and inspired the violent conflicts that lead to these military campaigns. In response to the increased military presence, some American Indians relocated, though many, including Chief Tenaya, left the camp.

During the 1850s and 1860s, tourism drove numbers of visitors to Yosemite Valley. Magazines depicting the scenery of the Valley drew the attention of the nation, and in 1855 James M. Hutchings organized the first tourist excursion to the Valley. Within two years of this trip, entrepreneurs constructed hotels to capitalize on what would become a thriving tourist trade. The community of Wawona, for example, was founded near the site of the log cabin built by Galen Clark in 1857. Clark, originally from New Hampshire, had moved to California during the Gold Rush, and moved to the Valley in 1856 as a homesteader. Clark established a 160-acre homestead and 12-foot-by-16-foot cabin, which was called "Clark's Station" or "Clark's Crossing" (Greene 1987).

Homestead claims were filed, orchards were planted, and Yosemite Valley became a residential base for many families during the 1850s and 1860s. Hutchings became a permanent resident of the Valley in 1864 and constructed several structures, including a sawmill on Yosemite Creek. By 1870, the establishment of visitor hotels in the Valley had created a need for local fresh produce and livestock. James Lamon, the Valley's first non-indigenous homesteader, became one of the largest producers of commercial agricultural products in the Valley (Greene 1987).

In 1864, President Abraham Lincoln and the U.S. Congress set aside the Big Tree Grove (Mariposa Grove) and Yosemite Valley as a public park to preserve the monumental scenic qualities of the area. The act clearly stated that the Valley and Mariposa Grove were to be managed by the governor of California and his eight appointed commissioners, with Frederick Law Olmsted appointed as chairman by the governor and elected by the commission (Greene 1987).

Due to the early conservation movement led by people such as John Muir and Robert Underwood Johnson, Congress passed an act establishing Yosemite National Park in 1890. This act brought protection to the lands and resources within the watersheds of the Tuolumne River and Merced River systems. The park was managed by U.S. Cavalry troops sent from the Presidio in San Francisco. Yosemite was the responsibility of the Department of the Interior (DOI), and army units answered to both DOI and Army. By 1906, the State of California had relinquished their rights of control over the Yosemite Valley and Mariposa Grove grant lands, ceding them to the U.S. government (Greene 1987).



Between 1906 and 1914, Yosemite Valley and the Mariposa Grove were administered by the U.S. Army, which established camp at the site of an American Indian village. Major H.C. Benson, acting superintendent from 1905 until 1908 under the Department of the Army, stated in his 1907 annual report that, “[s]ome definite general plan should be devised for the beautifying of the valley and making it the most beautiful park in the world. All bridges and buildings constructed in the future should conform to a definite plan, suited to existing conditions. All roads should be laid out according to a plan fully worked out by a competent landscape gardener, nothing should be done in the way of expending money which does not tend to carry out these ideas. All small buildings, practically shacks, should be replaced by stone buildings, and all bridges, when replaced, should be either of stone or concrete.” Many bridges and roads were, in fact, built by the U.S. Army Corps of Engineers between 1905 and 1915 (Carr 1998). Bridges such as the Bridalveil Falls bridges in 1913 set the precedent for later Rustic design for bridges established in the Yosemite Bridge Historic District.

In 1916 Congress created the National Park Service with a mandate to conserve the scenery and the natural and historic objects and provide opportunities for the enjoyment of future generations. The advent of automobile culture in the late 1910s and early 1920s changed the management plan for the park. As early as 1919, nearly 75% of visitors to Yosemite entered as auto tourists in their own cars. The demographic shift indicated that the era of the national park as a minimally funded, semiprivate resort had seen its day. After the All-Year Highway (Highway 140) to Yosemite opened in 1926, the annual number of visitors jumped to nearly half a million, up from about 40,000 just 10 years prior. Auto tourists, not reliant on concessioners, were part of a much larger and broader public that required additional facilities at a scale previously absent from the park (NPS 2006d). Rustic-style architecture was a type of design and style of construction used throughout the national parks beginning with the Yosemite Administration Building in 1924, and remains in use through the present. The style expressed the philosophy that buildings should be in harmony with the landscape and in harmony with each other. Oversized stone and logs were used in construction to ensure that the mass of the building appeared to fit within the setting. For example, The Ahwahnee hotel, which opened in 1927, is a six-story steel-framed building, sheathed in textured concrete and stone veneer to simulate rough wood siding and massive stone piers. The Ahwahnee culminated epitomized the tradition of massive, centralized national park lodges built by concessioners to cater to wealthy tourists (NPS 2006d). Yosemite Village Historic District contains a collection of rustic architecture dating from the 1918 through the 1930s.

The primary trails originating in the valley are the Mist Trail, Four Mile Trail, Yosemite Falls Trail, Pohono Trail, and the Valley Loop Trail. The Valley Loop Trail dates from the 1920s and was originally built as a bridle trail, generally aligned along existing circulation routes. Thirteen additional miles were added to the Valley Loop Trail in 1928, requiring the construction of 14 bridges. Today, the Valley Loop Trail includes the entire remaining bridle trail system in the valley and it is approximately 21 miles long.

The Great Depression resulted in a decrease of tourists visiting the Valley, but the initiation of Franklin D. Roosevelt’s New Deal in the spring of 1933 resulted in an unprecedented era of park development and park system expansion. The Public Works Administration and Civilian Conservation Corps (CCC) were responsible for completing a tremendous amount of work in the 1930s. Their extensive range of projects in the Valley included construction of roads, trails, bridges, fire roads, fire buildings, fire lanes, fire trails, comfort stations, campgrounds, and a rock diversion channel at Yosemite Creek (Greene 1987).

Visitation to the Valley further decreased during World War II but increased to unprecedented levels as soon as the war ended. In 1954, over a million park visitors were recorded. However, in 1955, Yosemite experienced the worst flooding ever recorded in the Valley. Facilities that had already been damaged in the floods of 1950 were inundated, along with additional roads, trails, bridges, and other facilities. In 1956, Park Service Director Conrad L. Wirth announced Mission 66 as a major new construction campaign. Intended to improve or replace aging and inadequate national park facilities, Mission 66 was implemented to meet the demand for services created by postwar levels of visitation. This increased funding and visitation, as well as flood damage repair, came together and resulted in major changes to Yosemite Valley. Major Yosemite projects in the Mission 66 program included the Tioga Road middle segment and the El Portal Administrative area housing. The Yosemite Valley visitor center was completed in 1968. In 1970, much of the Valley's road network was made into a one-way loop. The addition of parking lots along with the new concession and visitor use buildings during the Mission 66 period make the public plaza area of the Village one of the most changed areas since 1942 (NPS 2006d).

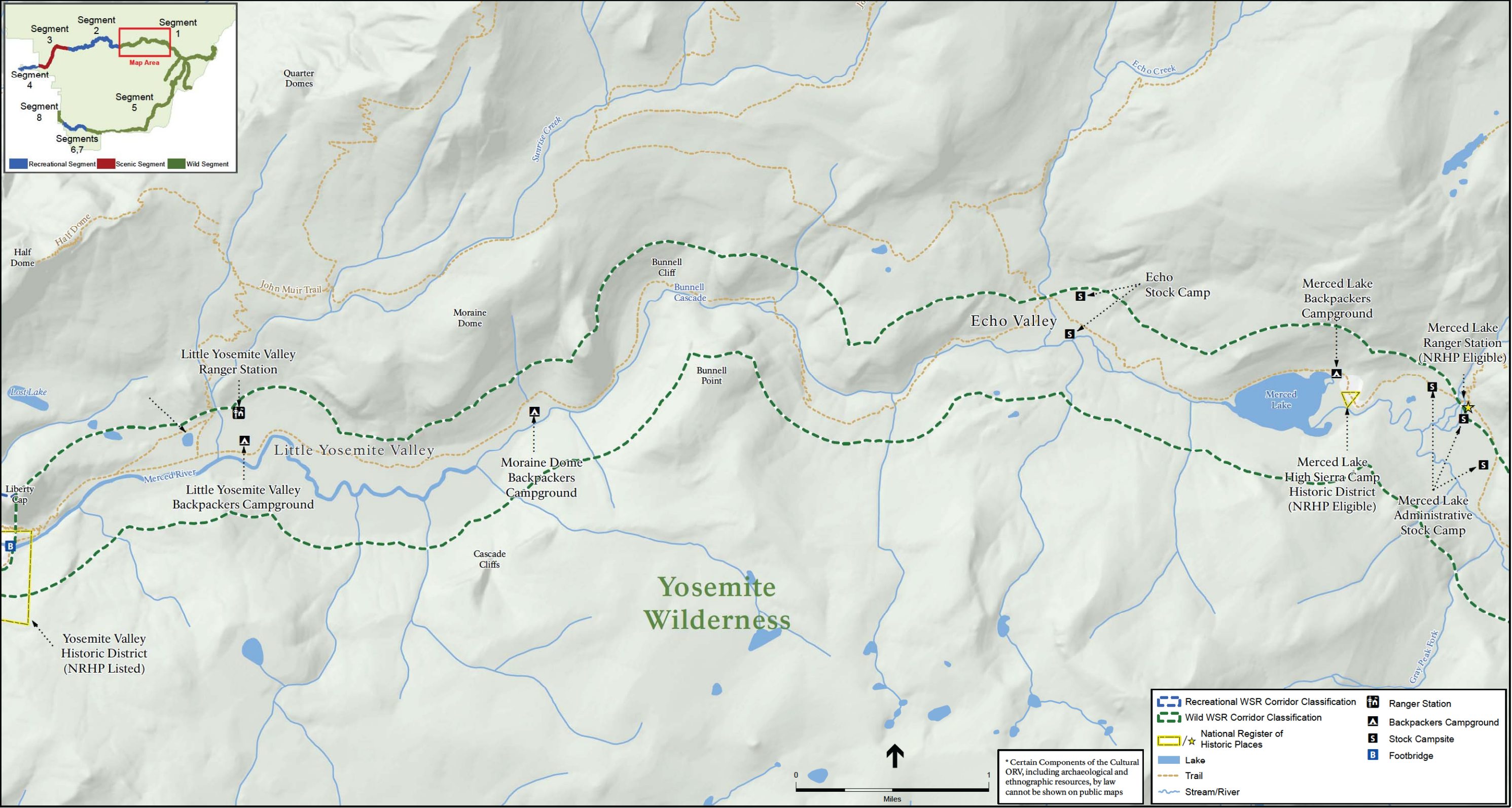
### *Properties Analyzed for this Plan*

Historic properties that could potentially be affected by the Merced River Plan include various National Register-listed historic districts, landscapes, individual historic buildings, structures, trails, and other features in each of the river segments that are eligible or potentially eligible for inclusion in the NRHP. It should be noted that the majority of post-WWII buildings have not been assessed for eligibility and that prior to removal or alteration of these resources, assessments as to their eligibility for listing on the National Register would be completed in order to carry out actions with potential impact to these areas and appropriate mitigations consistent with the proposed Merced River Plan programmatic agreement and consistent with Section 110 of the NHPA. Tables 9-207 through 9-210 provide detail regarding the historic properties within the APE.

### *Historic Period Resources*

**Segment 1: Merced River Above Nevada Falls – Historic Properties.** Known historic resources within Segment 1 consist of the eligible Merced Lake High Sierra Camp Historic District and the eligible Merced Lake Ranger Station. **Table 9-207** and **figure 9-47** describe these resources.

**Segment 2: Yosemite Valley – Historic Properties.** Known historic resources within the APE associated with Segment 2 include four NRHP- listed districts (Camp Curry Historic District, Yosemite Valley Bridges Historic District, Yosemite Valley Historic District, Yosemite Village Historic District), including their associated contributing historic buildings and structures; numerous structures that have been determined to be eligible for listing on the NRHP as well as those that are individually listed; and three National Historic Landmarks (The Ahwahnee, Rangers' Club, and the LeConte Memorial Lodge); In addition, eight granite-faced, concrete arched, two-lane vehicle bridges were constructed along the Valley Loop Road between 1922 and 1933. Six of the bridges (Ahwahnee, Clark's, Pohono, Sugar Pine, Happy Isles, and Stoneman) cross the Merced River, while two others (Yosemite Creek and Tenaya Creek) cross creeks. Each bridge is listed in the NRHP as contributing features to the Yosemite Valley Historic District, as well as a separate Yosemite Valley Bridges Historic District. **Table 9-208** describes these resources.



SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-47**  
Segment 1 - Little Yosemite Valley and  
Merced Lake High Sierra Camp  
Historic Properties

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**TABLE 9-207: KNOWN HISTORIC PROPERTIES WITHIN SEGMENT 1**

National Register Listed or Eligible Properties	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
Merced Lake High Sierra Camp Historic District	District	Eligible	Local	The Merced Lake High Sierra Camp is considered significant in recreation and education as one of seven high country camps whose origin dates back to the earliest days of the NPS.	The NRHP boundary includes all the tents, cooking structures, restrooms and bathhouses, and other miscellaneous structures associated with the High Sierra Camp facilities and the immediate environment.
Merced Lake Ranger Station	Building	Eligible	Local	The Merced Lake snow survey shelter/patrol cabin is considered significant in conservation.	building
SOURCE: NPS 2012h Abbreviations: N/A = not applicable; NPS = National Park Service; NRHP = National Register of Historic Places					

Many historic sites and structures within the Valley have been singled out for their significance and are either National Historic Landmarks or are listed in or have been determined eligible for listing in the NRHP. National Register-listed historic properties in Yosemite were identified in a 2012 consultation letter with SHPO. These resources are described in greater detail in tables 9-207 through 9-210 and figure 9-48.

The geophysical characteristics of Yosemite Valley have shaped patterns of human use since the earliest days of American Indian settlement. As a result, the Valley's cultural landscape is significant for its role in the exploration and settlement of the west, as well as for its architecture, art, landscape architecture, recreation, and conservation. The historical importance of the Valley landscape derives from the fact that countless generations of local tribal groups and, later, millions of park visitors have infused the Valley's natural features with great cultural significance.

**Segments 3 and 4: Merced River Gorge and El Portal – Historic Properties.** Known historic resources within Segments 3 and 4 include the Merced River Travel Corridor, the Yosemite Hydroelectric Power Plant (the Cascades Powerhouse), the Old Coulterville Forestry Department Road and Trail, and designated El Portal Historic Structures. **Table 9-209** describes these resources and **figures 9-49 and 9-50**.

The primary element of the Merced Canyon Travel Corridor is El Portal Road, which was originally constructed as a wagon road in 1905 and was substantially reconstructed in 1925. The road includes hand-laid stone parapet guardwalls and drainage catchment structures. Following consultation with the SHPO and the ACHP, many of these features were removed as part of the El Portal Road Reconstruction Project that was a direct consequence of damage caused by a catastrophic flood in 1997. Other properties within the river corridor include rock quarries, historic trash scatters, sections of pre-1925 roadbed, historic work campsites, and the Arch Rock Entrance Station complex (eligible for the NRHP as an individual property), which consists of a ranger residence/office, entrance kiosk, parking lot, and restroom building (Volpe 1997).

**TABLE 9-208: KNOWN HISTORIC PROPERTIES WITHIN SEGMENT 2**

National Register-Listed or Eligible Properties (Listing Number)	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
The Ahwahnee Hotel (1977000149)	Building	Listed	National	The Ahwahnee, because of its rustic architectural design and unaltered condition, is among the most significant park hotels in the United States. The significance of the hotel lies in the preservation of the exterior of the building and its setting, and in the preservation of the interior, with its original decorative features and furnishings.	The 35-acre site, which includes a number of small structures and landscape features, eight guest cottages, an employee dormitory, two tennis courts, a pond, and two parking lots.
Camp 4(Sunnyside Campground) (2003000056)	Site	Listed	National	Camp 4 has integrity and is listed in the NRHP for its significant association with the growth and development of rock climbing in the Yosemite Valley after World War II.	Entire area, including natural features (boulders, cliffs, vegetation), is considered a contributing resource.
Camp Curry Historic District (1979000315)	District	Listed	Local	This historic district is illustrative of the foundation and early development of the Curry family concession enterprise and their unique contribution to a character of accommodation still available in Yosemite.	Bungalettes, bungalow duplexes and four-plex cabins, Foster Curry Bungalow, Cabin 101 (Nob Hill Cabin), comfort stations, and Terrace Clubhouse (Women's Club).
Glacier Point Road Historic District	District	Eligible	Local	Glacier Point Road exemplifies the naturalistic landscape design aesthetic of the NPS in the 1930s and represents the initial burst of development of automobile roads in the national parks.	Includes 140 contributing features.
Glacier Point Trailside Museum (1978000375)	Building	Listed	Local	This museum, the first permanent teaching instrument of its kind in the NPS, is an integral component of the old Yosemite Museum.	building
LeConte Memorial Lodge (197700148: NHL)	Structure	Listed	National, Regional, local	Originally constructed in 1903, and moved and rebuilt in 1919, the lodge was the principal foothold of the influential Sierra Club in the Sierra Nevada Mountains. It is a transitional building in 20th century architecture, with strong European roots in its Tudor Revival design, combined with an interesting use of building materials found in the work of architects of the Bay Area tradition. An outstanding example of the theory that the materials and site should determine the design of the building.	building
New Big Oak Flat Road	Structure	Eligible	Local	The new Big Oak Flat road tunnels, bridges, and retaining walls are considered significant in transportation as well as landscape architecture and architecture.	Cascade Creek Bridge, Tamarack Creek Bridge, Wildcat Creek Bridge, and three tunnels.



**TABLE 9-208: KNOWN HISTORIC PROPERTIES WITHIN SEGMENT 2 (CONTINUED)**

National Register-Listed or Eligible Properties	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
Old Big Oak Flat Road	Structure	Eligible	Local	The Big Oak Flat Road is significant as one of the earliest transportation routes into Yosemite Valley. It served horse and wagon traffic and it eventually opened the Yosemite Valley to automobiles.	structure
Rangers' Club (1987001414: NHL)	Building	Listed	National, regional	The Rangers' Club in Yosemite Valley is representative of NPS's first director, Stephen T. Mather's commitment to an architectural aesthetic appropriate for the park lands that he was charged to manage. The Rangers' Club is also of regional historical significance in the category of conservation through its connection with the first director of the NPS and through its integrity of function as the residence for unmarried rangers.	building
Substation and Substation Control House No. 1	Building	Eligible	Local	The Substation and Substation Control House #1 is the oldest and only surviving Rustic-style substation control house and substation complex in Yosemite Valley.	building
Wawona Tunnel	Structure	Eligible	National	The Wawona tunnel is considered significant in the fields of transportation, architecture, and landscape architecture. It was built as part of the rerouting of the old Wawona Road between Yosemite Valley and Grouse Creek, where engineers determined that a tunnel was necessary to attain a satisfactory grade. Construction of a tunnel would also be cheaper and require less excavation. Its construction was an innovation in highway design within the National Park System, following the precedent set by the Zion Park highway tunnel. Upon completion, it was the longest vehicle tunnel in the western United States.	Wawona tunnel and the low stone retaining walls around the parking area.
Yosemite Valley Bridges Historic District (1977000160)	District	Listed	National	These Valley bridges are unique for their architectural design and aesthetic considerations. The use of native granite in the form of rough boulders reflects the tenets of the Rustic style.	Yosemite Creek Bridge, Ahwahnee Bridge, Clark's Bridge, Pohono Bridge, Sugar Pine Bridge, Tenaya Creek Bridge, Happy Isles Bridge, Stoneman Bridge.
Yosemite Valley Chapel (1973000256)	Building	Listed	Regional	This chapel, now the oldest building in Yosemite, was erected in 1879 as a chapel and has been used as such since then. It is still used for church services on Sundays. The simple architectural design of the structure represents a particularly fine example of the early chapels constructed in the Sierra Nevada Mountains and is well preserved.	building

**TABLE 9-208: KNOWN HISTORIC PROPERTIES WITHIN SEGMENT 2 (CONTINUED)**

National Register-Listed or Eligible Properties	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
Yosemite Valley Historic District (2004001159)	District	Listed	National	The Valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Since 1864, Yosemite has been an archetype for the preservation of scenic places through their development as public parks.	District consists of 929 buildings and sites, including Yosemite Valley Chapel, LeConte Memorial Lodge, El Capitan Bridge, Ansel Adams Residence, Yosemite Pioneer Cemetery, and The Ahwahnee, located within specific developed areas including the Yosemite Village, Camp Curry, and The Ahwahnee. Additionally, Yosemite Valley Historic District includes resources such as natural systems/features, spatial organization, veg, circulation, land use, vistas, etc. all contribute to the significance of the district.
Yosemite Village Historic District (1978000354)	District	Listed	National	This historic district, through both sites and structures, represents almost the entire range of Yosemite history since 1855, including early homesteading, John Muir's early residence in the park, the development of the national park, the U.S. Army's role in park administration, and the evolution of early NPS administration and interpretation of the resources of Yosemite.	District consists of 44 buildings and sites, including residences, Ansel Adams studio, museum, post office, and park administration building.
<b>National Historic Landmarks</b>					
The Ahwahnee Hotel	Building	Listed	National	The Ahwahnee, because of its Rustic architectural design and unaltered condition, is among the most significant park hotels in the country. The significance of the hotel lies in the preservation of the exterior of the building and its setting, and in the preservation of the interior, with its original decorative features and furnishings.	Included within the boundaries of the nomination are the meadow directly south of the hotel, the stone gatehouse marking the entrance to the property, the parking lots, and the small pond and walkways at the building's entrance, directly north of the porte-cochere.
LeConte Memorial Lodge	Building	Listed	Regional, local	Originally constructed in 1903, and moved and rebuilt in 1919, this lodge was the principal foothold of the influential Sierra Club in the Sierra Nevada Mountains. It is a transitional building in 20th century architecture, with strong European roots in its Tudor Revival design combined, with an interesting use of building materials found in the work of architects of the Bay Area tradition. An outstanding example of the theory that the materials and site should determine the design of the building.	building



**TABLE 9-208: KNOWN HISTORIC PROPERTIES WITHIN SEGMENT 2 (CONTINUED)**

National Register- Listed or Eligible Properties	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
<b>National Historic Landmarks (cont.)</b>					
Rangers' Club	Building	Listed	National, regional	The Rangers' Club in Yosemite Valley was donated to the NPS by its first director, Stephen T. Mather. The building is representative of his commitment to an architectural aesthetic appropriate for the park lands that he was charged to manage.	building
SOURCE: NPS 2012h Abbreviations: N/A = not applicable; NHL = National Historic Landmark; NPS = National Park Service					

**TABLE 9-209: KNOWN HISTORIC PROPERTIES WITHIN SEGMENTS 3 AND 4**

National Register-Listed or Eligible Properties	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
Bagby Stationhouse (1979000316)	Building	Listed	Local	Along with the uniquely designed twin water tanks, the stationhouse is illustrative of an important era in Yosemite's history.	This 1-acre historic district includes the Bagby stationhouse, water tanks, and turntable
El Portal Hotel	Building	Eligible	Local	This building qualifies for listing because of its association with the development and expansion of the tourist industry at El Portal. It also qualifies for listing because it embodies architectural characteristics associated with a 1930s-era commercial buildings construction type.	Building
El Portal Historic Structures	District	Eligible	Local	The Village Center and Old El Portal areas appear to qualify for listing in the NRHP as historic districts under Criterion A because they are associated with the development and expansion of the railroad, mining, timber, and tourist industries at El Portal, as well as the town's socioeconomic development and expansion.	Murchison House, Yosemite Research Center Office, three National Lead Company residences, Village Center Store, three Yosemite Valley Railroad residences, school, El Portal Market, El Portal Hotel
El Portal Murchison House	Building	Eligible	Local	This building qualifies for listing because of its association with the significant National Lead Company barium mining operations at El Portal; it embodies the distinctive architectural characteristics associated with mining-related residential and management structures during the late 1920s-early 1930s; and it is associated with Earl H. Murchison, National Lead Company superintendent oat El Portal.	Building
El Portal Old Schoolhouse	Building	Listed	Local	The El Portal Old Schoolhouse is significant as an educational institution that serves as an example of the socioeconomic development of the town of El Portal. Architectural characteristics and building materials associate the Old Schoolhouse with the local El Portal vernacular style during the 1920s and 1930s.	Building
Hetch Hetchy Railroad Engine No. 6 (1978000360)	Structure	Listed	Local, Regional	Hetch Hetchy Railroad Engine No. 6 is the last and heaviest locomotive, and the only one of Shay design, purchased by the Hetch Hetchy Railroad. It contributed in an important way to the history of a railroad as part of a regionally significant engineering project, and later as part of a locally significant lumber industry logging railroad.	structure

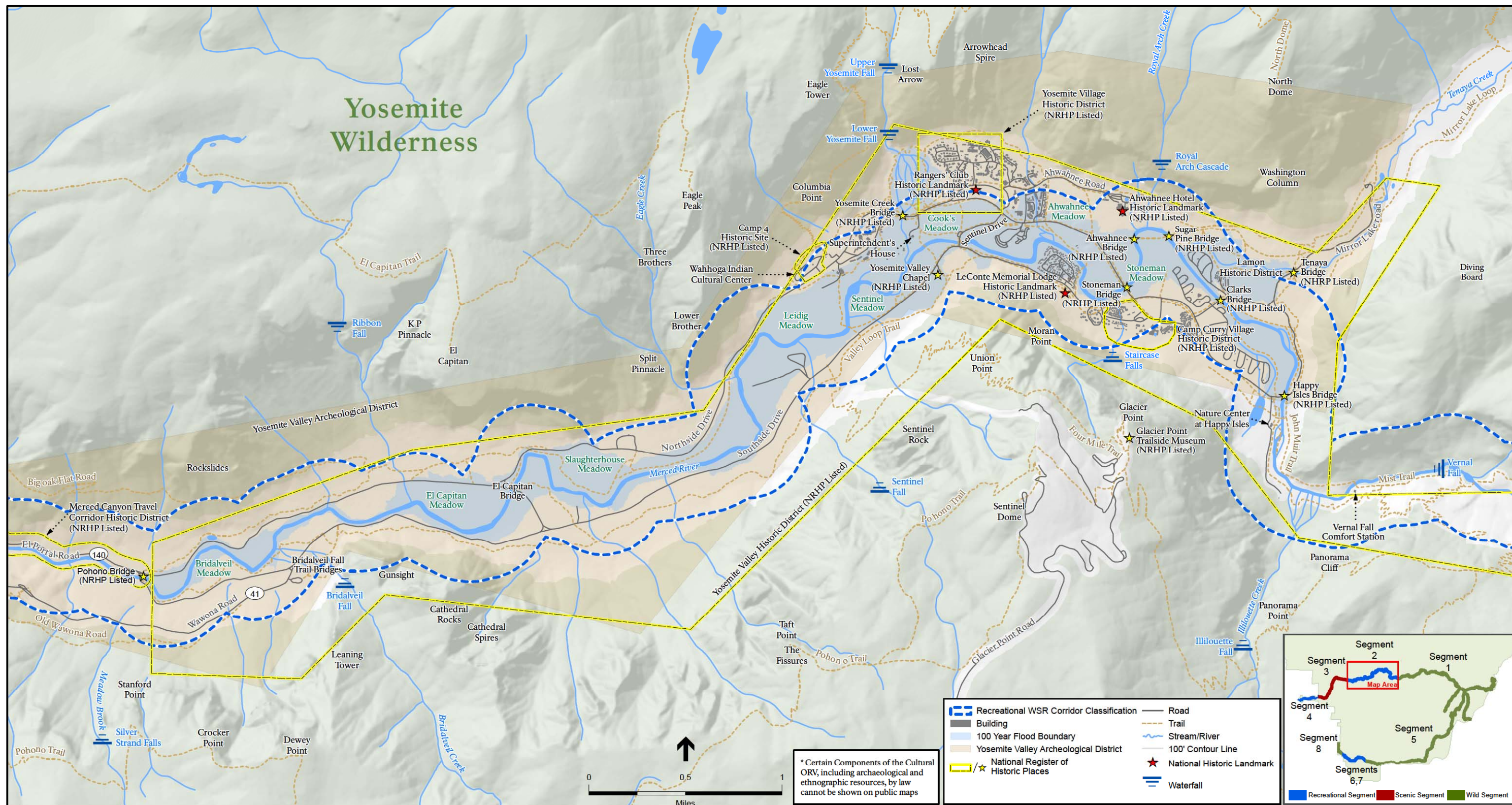
**TABLE 9-209: KNOWN HISTORIC PROPERTIES WITHIN SEGMENTS 3 AND 4 (CONTINUED)**

National Register-Listed or Eligible Properties	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
McCauley and Meyer Barn (1978000353)	Building	Listed	Local	This barn is among the last remaining barns in Yosemite that possess architectural significance and integrity. They also represent some local interest in agriculture through association with pioneering ranches once located within the park boundaries.	Building
Merced Canyon Travel Corridor Historic District	District	Eligible	National, state	This historic district is a unique multiple resource historical property eligible for listing on the NRHP. The travel route from El Portal to Yosemite Valley has been used for at least the past 2,000 years, spanning a myriad of cultural needs satisfied by the natural landscape and its resources.	El Portal Road, historic period sites (trash scatters, Arch Rock Entrance Station, historic road beds, Coulterville Road Blacksmith Shop, aligned rock structure, historic camp area, Cascade Falls Trail, possible privy, CCC camp, Pohono pit, rock quarry), landscape, and prehistoric/historic native American sites.
National Lead Company	Building	Eligible	Local	The district qualifies for listing because of its association with the significant National Lead Company barium mining operations at El Portal; it embodies the distinctive architectural characteristics associated with mining-related residential and management structures during the late 1920s-early 1930s.	Three residences, including Murchison House.
National Lead Company Residence Buildings Nos. 703 704, and 705	Building	Eligible	Local	These buildings qualify for listing because of their association with the significant National Lead Company barium mining operations at El Portal, embodying the distinctive architectural characteristics associated with mining-related residential and management structures during the late 1920s-early 1930s.	Building
Old Coulterville Road and Trail	Structure	Eligible	Local	The Coulterville Road is the first stagecoach road to have reached the floor of Yosemite Valley and is of local significance in transportation and engineering.	structure
Track Bus No. 19 (1978000363)	Object	Listed	Local	Track Bus No. 19 is of local historical significance in the category of transportation. It is one of the few survivors of the gasoline-powered rigs which ran on the Hetch Hetchy Railroad.	object

**TABLE 9-209: KNOWN HISTORIC PROPERTIES WITHIN SEGMENTS 3 AND 4 (CONTINUED)**

National Register-Listed or Eligible Properties	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
Yosemite Hydroelectric Power Plant	Structure	Eligible	State	The Yosemite hydroelectric power plant is a good example of its type and possesses a high level of integrity. Though once commonplace, the type of system used by the power plant is becoming rare, with intact systems even more rare. There are no other known penstock-fed systems in California with their original Pelton wheels (a particular type of turbine), generators, switch boards, and design intact.	Diversion dam, the intake, the screens and screenhouse, the penstock, the surge tank, the powerhouse and equipment, the 11-kilovolt distribution line into the Valley.
Yosemite Valley Railroad Caboose No. 15 (1978000352)	Object	Listed	Local	Yosemite Valley Railroad caboose No. 15 is an object of local historical significance as one of the last surviving cabooses of the historic Yosemite Valley Railroad.	object
Yosemite Valley Railroad Residences	Structures	Eligible	Local	These buildings qualify for listing because of their association with the development of the railroad industry at El Portal, and because they exhibit the architectural characteristics associated with an early 20th-century railroad employee residential building type.	building
Abbreviations: No. = number; NPS = National Park Service; NRHP = National Register of Historic Places SOURCE: NPS 2012h					



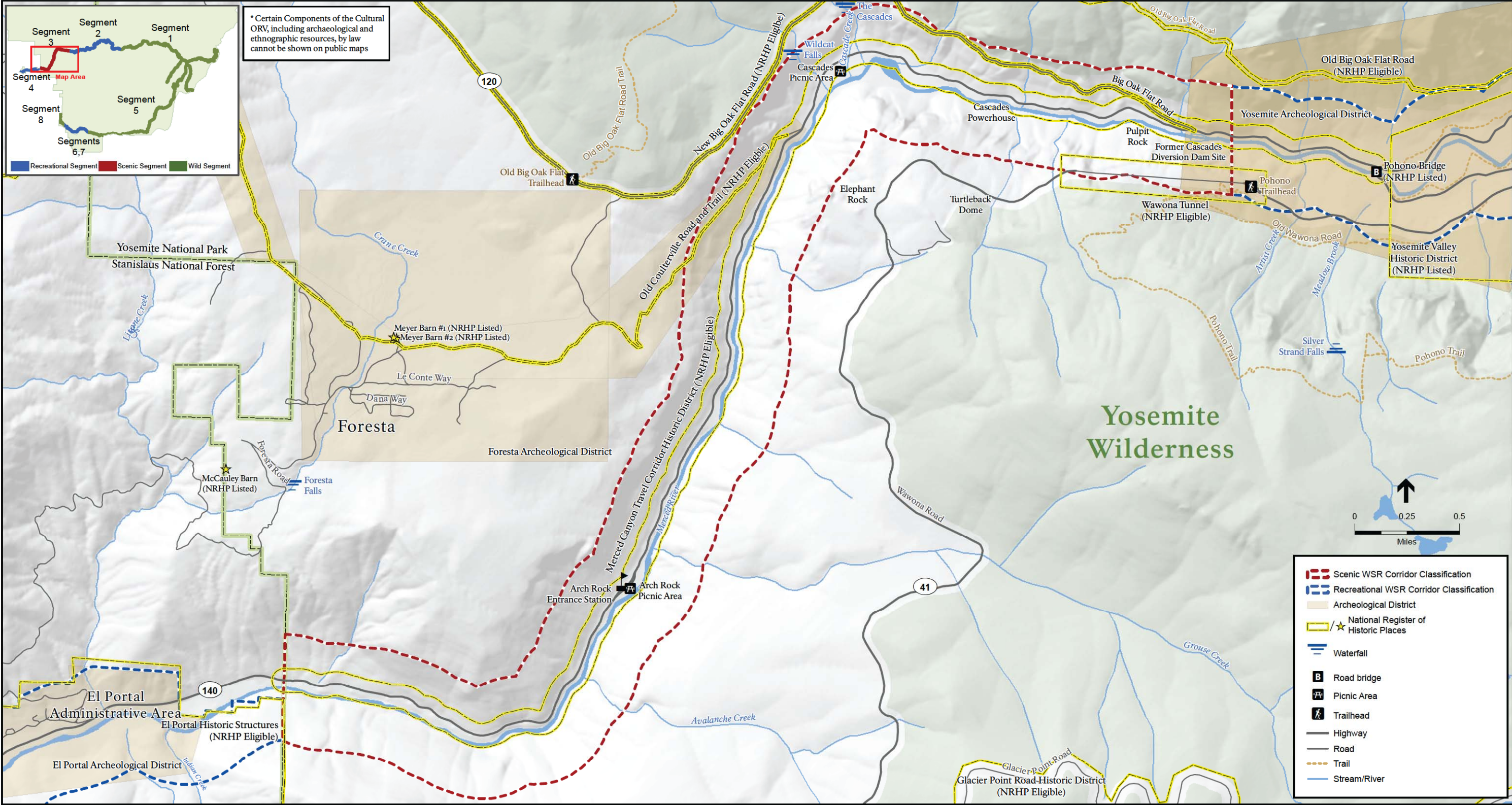


SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-48**  
Segment 2 - Yosemite Valley  
Historic Properties





SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-49**  
Segment 3 - Merced Gorge  
Historic Properties





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Properties in El Portal that are either listed in or are eligible for listing in the NRHP include the Bagby stationhouse (now used as the Yosemite Conservancy headquarters); Yosemite Valley Railroad caboose number 15; El Portal Murchison House; three National Lead Company residences; El Portal Old Schoolhouse; the El Portal Hotel (now used as the NatureBridge headquarters), and two Yosemite Valley Railroad residences, mostly in the Village Center of Old El Portal. Some of these structures are privately owned but located on federal land.

**Segments 5, 6, 7, and 8: South Fork Merced River Wawona – Historic Properties.** Known historic resources within Segments 5, 6, 7, or 8 include the Wawona Hotel and Thomas Hill Studio District NHL Wawona, Wawona Covered Bridge, Hodgdon Homestead Cabin, Chris Jorgensen Studio, Acting Superintendent's Headquarters, and the Pioneer Yosemite History Center. **Table 9-210** and **figure 9-51** describe these resources.

The most significant of the historic structures in Wawona is the Victorian-style Wawona Hotel complex. The hotel complex includes seven structures and is significant for its architectural features as well as for its historical associations with early California commerce and the landscape painter Thomas Hill. The complex includes the Pavilion (former Hill's Studio), Little White (Manager's Cottage), Little Brown (Moore Cottage), Long White (Clark Cottage), Long Brown (Washburn Cottage), the Wawona Hotel, and the annex. The complex was designated a National Historic Landmark on May 28, 1987. The Wawona Golf Course, in operation since 1918, is being evaluated as a contributing resource under the current Cultural Landscape Inventory being completed by the NPS Pacific West Regional Office staff.

The Pioneer Yosemite History Center, which was determined eligible for listing as a historic district by the California SHPO in 2011, contains many structures relocated from other areas of the park to its current location on the bank of the South Fork Merced River. This site consists of 26 contributing features, including Wawona Grey Barn/Washburn Barn; Hodgdon homestead/cabin, Yosemite Transportation Company office/Wells Fargo office, Wells Fargo utility building, Acting Superintendent's Headquarters/Army cabin, Army tack room, Crane Flat ranger cabin/ranger patrol cabin, jail/powder house/morgue, Chris Jorgenson Studio/artist cabin, wagon shelter/wagon shed, Wawona Covered Bridge, Wawona stables, Chinese laundry/laundry/carriage shop; Pioneer Yosemite History Center signs (two); historic circulation system; flagpoles (two); hitching posts (two); retaining walls; stone perimeters; privy; water trough; and split rail perimeter fences (NPS 2011s).

Four of the buildings are also listed as individual resources in the National Register, including the Hodgdon homestead/cabin, Acting Superintendent's Headquarters/Army cabin, Chris Jorgenson Studio/artist cabin, and Wawona Covered Bridge.

Several CCC structures (e.g., the NPS maintenance complex and ranger office) and three residences constructed immediately after the Wawona land purchase in 1932 still exist in this area and are being assessed for eligibility through a cultural landscape inventory being completed by the NPS Pacific West Regional Office for the Wawona Valley.

**TABLE 9-210: KNOWN HISTORIC PROPERTIES WITHIN SEGMENTS 5, 6, 7, AND 8**

National Register-Listed or Eligible Properties (Listing Number)	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
Acting Superintendent's Headquarters (1978000362)	Building	Listed	Local	This building is the sole remaining structure associated with the military tenure in Wawona.	Building
Chris Jorgenson Studio (1979000280)	Building	Listed	Local	Yosemite has been a lodestone for artists since 1856 when lithographer Thomas Ayres accompanied the first tourist party to the Valley. One of the park's most prolific scenic interpreters was the noted California painter Chris Jorgenson, who maintained a seasonal residence and studio in the Valley for 20 years. This studio, now an integral part of the Pioneer Yosemite History Center, is of local significance in art.	Building
Hodgdon Homestead Cabin (1978000356)	Structure	Listed	Local	The Hodgdon homestead cabin possesses local architectural significance as the finest example of a pioneer homestead in Yosemite.	Building
Pioneer Yosemite History Center	District	Eligible	Local	The Pioneer Yosemite History Center is significant under the NRHP criterion A for its association with the development of tourism and outdoor recreation during the Mission 66 period.	Contributing features include Wawona grey barn/Washburn barn; Hodgdon homestead/cabin; Yosemite Transportation Company office/Wells Fargo office; Wells Fargo utility building; Acting Superintendent's Headquarters/Army cabin; Army tack room; Crane Flat ranger cabin/ranger patrol cabin; jail/powder house/morgue; Chris Jorgenson studio/artist cabin; Wagon shelter/wagon shed; Wawona Covered Bridge; Wawona stables; Chinese laundry/laundry/carriage shop; Pioneer Yosemite History Center signs (2); historic circulation system; flagpoles (2); hitching posts (2); retaining walls; stone perimeters; privy; water trough; and split rail perimeter fences.
Wawona Covered Bridge (2006001261)	Structure	Listed	State	The Wawona Covered Bridge is significant at the state level under NRHP criteria A, B, and C for its association within the contexts of transportation, entertainment, and recreation; its association with Galen Clark; and as a unique example of a covered bridge within both California and the western region of the NPS.	structure

**TABLE 9-210: KNOWN HISTORIC PROPERTIES WITHIN SEGMENTS 5, 6, 7, AND 8 (CONTINUED)**

National Register-Listed or Eligible Properties (Listing Number)	Property Type	NR Status	Level of Significance	Significance Summary	Contributing Resources
Wawona Hotel and Pavilion (1975000223: NHL)	District	Listed	National	Wawona's architectural importance to American architecture is the largest existing Victorian-style hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity.	The Clark Cottage, the Wawona Hotel building, the Little White Cottage, the Moore Cottage, the Washburn Cottage, the Pavilion (former Hill's studio), and the Annex.
Yosemite Transportation Company Office (1978000355)	Building	Listed	Local	The Yosemite Transportation Company office (Wells Fargo office) is of local significance in the fields of architecture and transportation, based on the design of the structure and on its use for many years as a transportation facility for visitors to Yosemite Valley.	Building
<b>National Historic Landmarks</b>					
Wawona Hotel and Thomas Hill Studio (1975000223)	District	Listed	National	Wawona's architectural importance to American architecture is as the largest existing Victorian-style hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity.	Clark Cottage, the Wawona Hotel Building, the Little White Cottage, the Moore Cottage, the Washburn Cottage, and the Annex.
Abbreviations: N/A = not applicable; NHL = National Historic Landmark SOURCE: NPS 2012h					

## *Environmental Consequences Methodology*

Historic districts, buildings, structures, and landscapes are considered eligible for inclusion in the NRHP when the properties have significance and retain integrity associated with events that have made a significant contribution to the broad patterns of our history (Criterion A); when they are associated with the lives of persons significant in our past (Criterion B); when they embody the distinctive characteristics of a type, period, or method of construction (Criterion C); or when they have contributed or have the potential to contribute information about the past (Criterion D). An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include those detailed in CFR 800.5 (a)(2)(i-vii), which include physical destruction or damage, alterations inconsistent with the Standards for the Treatment of Historic Properties (36 CFR part 68), relocation of the property, change in character of use, or neglect resulting in deterioration.

## **NEPA Methodology**

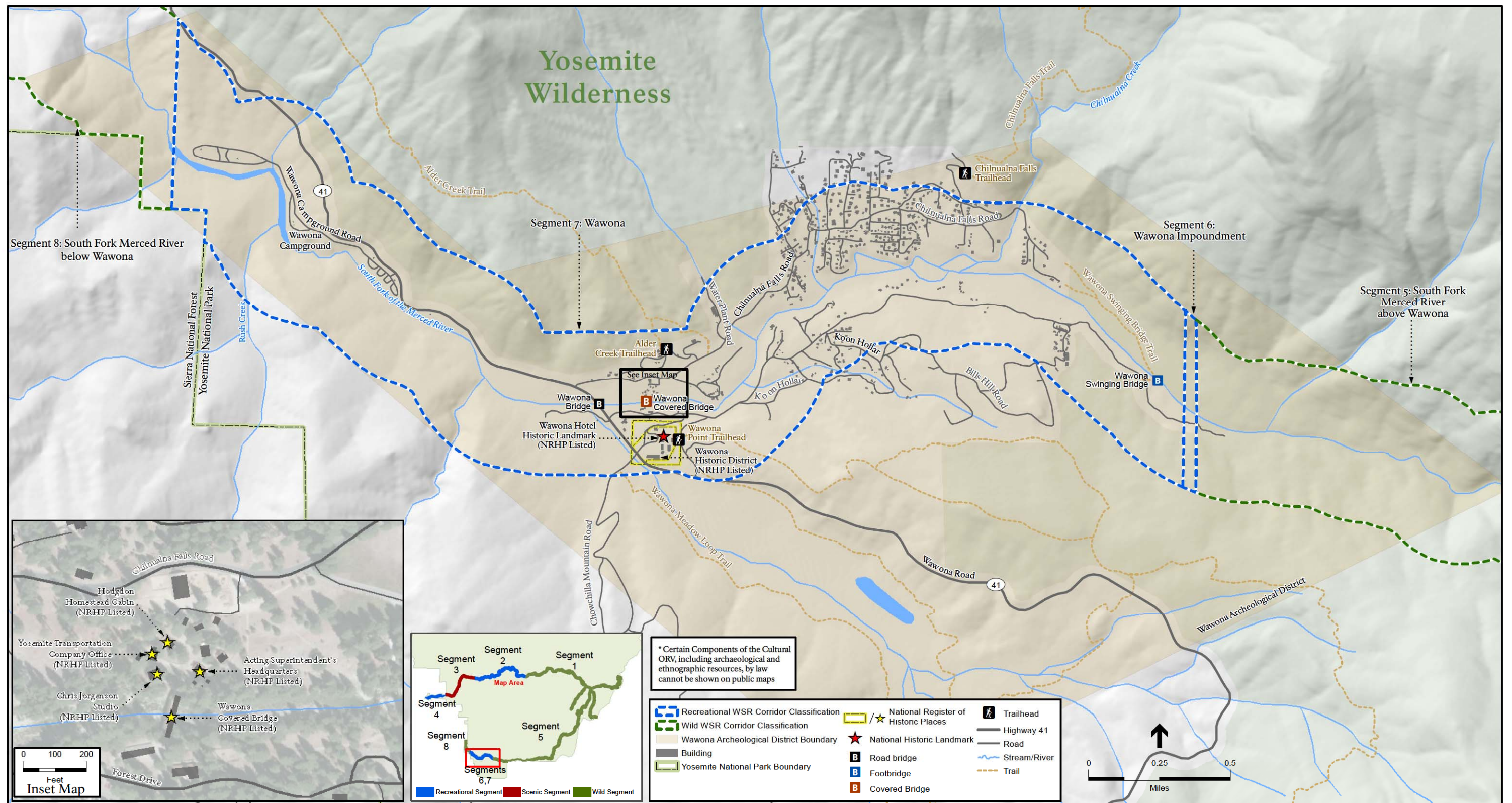
Analyses of impacts on the historic built-environment for the purposes of the NEPA are based on:

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For this analysis, local impacts would be those that occur in a specific area within a segment of the river. This analysis further identifies whether there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area within Yosemite. Regional impacts would be those that extend to the Yosemite gateway region.

**Intensity.** The intensity of impact would depend on the nature, location, and design of the undertaking, measurable change in character-defining features of a historic property, and the number of contributing elements of a historic district that would be affected. Under NEPA criteria, intensity of the impact depends on the eligibility of the resource and considers whether the impact on eligible or listed historic resources would be negligible, minor, moderate, or major, based on the criteria of adverse effect described above.

- **Negligible.** Impact is barely perceptible and not measurable; would be expected to have no discernible effect on historic resources; confined to small areas or a single contributing element of a larger National Register district or historic resource
- **Minor.** Impact is perceptible and measurable; remains localized and not expected to have an overall effect on historic resources.
- **Moderate.** Impact results in clearly detectable changes to a character-defining feature of a historic resource and could have an appreciable effect on historic resources.
- **Major.** Impact results in a substantial and highly noticeable change in character-defining features; could permanently alter historic resources.





SOURCE: NPS, 1997, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure 9-51**  
Segments 6,7,8 - Wawona  
Historic Properties

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- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary in duration, such as short-term impacts associated with construction or restoration activities. A long-term impact would have a permanent effect on historic resources.
- **Type of Impact.** The type of impact considers whether the impact would be beneficial or adverse to visitor services. Beneficial impacts would stabilize a historic resource to prevent future degradation, or appropriate active intervention would be performed to preserve the elements of the resource that qualify it for NRHP eligibility.

For the purposes of NEPA, “historic resources” include resources listed in and eligible for the NRHP. Resources that are assessed by park staff as being potentially eligible for listing on the National Register, but have not yet been inventoried, would require additional documentation prior to further planning, design and/or construction consistent with Sections 106 and 110 of the NHPA. In accordance with 36 CFR 800 criteria of effect, historic properties in the Merced River corridor are analyzed qualitatively, based on existing knowledge about values and significant elements and modifications that could be identified to alter character-defining features (features that qualify properties for inclusion in the NRHP). The proposed actions are assessed for the effects they may have on properties within the APE. Actions specific to individual alternatives that would affect these historic properties are described under each alternative.

### **Evaluating Impacts under the National Historic Preservation Act**

Any prehistoric or historic building, structure, object, site, landscape, or district that is included in, or is eligible for inclusion in the National Register, is termed a historic property and is managed for protection under the NHPA.

- ***Non-eligible historic resources.*** These are resources that fail to meet the criteria of the NRHP as described above.
- ***Listed historic resources.*** Listed historic resources are those properties that the Keeper of the National Register has officially added to the National Register of Historic Places.
- ***Eligible historic resources.*** Eligible historic resources are those which meet the criteria for listing on the National Register of Historic Places, and have been determined eligible either in concurrence with the SHPO or the Keeper of the National Register of Historic Places.

Types of historic properties include archeological sites, historic built-environment resources, archeological and historic districts, cultural landscapes, and traditional cultural properties. These resources may also be considered under the Archeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, and EO 13007 (Indian Sacred Sites).

Section 106 of the NHPA requires the federal agency to consider the effects of its undertakings on historic properties and to provide the ACHP a reasonable opportunity to comment. The agency must also identify the appropriate SHPO/Tribal Historic Preservation Officers to consult with during the process. It should also plan to involve the public, and identify other potential consulting parties.



Section 106 also applies to properties not formally determined eligible, but which meet eligibility requirements for the National Register and are therefore treated as eligible until a formal determination can be made.

### *NHPA Determinations of Effect*

Conventional terms used by the NPS to measure the context, duration, intensity, and type of impact as part of NEPA analysis are not valid for assessing effects on historic properties under NHPA standards. Because the effect on a historic property is measured by the status of the historic property's eligibility for listing in the NRHP, the negligible, minor, moderate, and major degrees do not apply. Either a historic property maintains the characteristics making it eligible for listing in the National Register or it does not.

The ACHP has issued regulations for the implementation of section 106, entitled *Protection of Historic Properties* (36 CFR 800). ACHP regulations discuss the following types of effect:

**No Historic Properties Affected:** When there are no historic properties present, or the action would have no effect on historic properties, the action is said to have no effect on historic properties.

**No Adverse Effect:** Occurs when there would be an effect on a historic property, but the action would not alter characteristics that make the property eligible for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the property.

**Adverse Effect:** Occurs when an action would alter, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the action that may occur later in time, be farther removed in distance, or be cumulative.

The regulations allow an agency, such as the park, to defer both the identification of historic properties (that is, the identification of whether or not a resource is eligible for the NRHP) and the effects assessment through the development of a programmatic agreement. The agreement may also stipulate additional terms, such as consultation, reporting criteria, monitoring, and dispute resolution. Yosemite National Park's section 106 review process is governed by national and park-specific programmatic agreements among the NPS, the ACHP, and the National Council of SHPOs or the California SHPO (NPS, ACHP, and NCSHPO 2008; NPS, SHPO, and ACHP 1999). As described previously, the Park is also proposing, via consultation with the ACHP, SHPO, and traditionally associated American Indian tribes and groups, the creation of a Merced River Plan PA regarding treatment of historic resources under the proposed management plan.

### *Resolving Adverse Effects on Historic Properties*

Adverse effects on built-environment historic properties (aboveground buildings and structures) under section 106 of the NHPA may be resolved with a good-faith effort to consider whether and how to avoid, minimize, or mitigate the effect. This may involve modifying the undertaking, imposing certain mitigation conditions, or implementing other measures negotiated in consultation with the SHPO, ACHP, American Indian tribal governments, and the public.



As requested by the State Historic Preservation Officer, compliance for the Merced River Plan will be in accordance with standard procedures for the protection of historic properties as identified in 36 CFR Part 800 as well as the 2008 Nationwide programmatic agreement between the NPS, ACHP, NCSHPO for compliance with section 106 of the NHPA. The park is committed to completing a plan-specific programmatic agreement per 36 CFR 800.14 prior to completion of the Record of Decision for the Merced River Plan. This programmatic agreement will be developed in coordination with the California State Historic Preservation Office (SHPO) and the Advisory Council for Historic Preservation (ACHP) as well as in consultation with all traditionally associated American Indian tribes and groups affiliated with the park. The public will have the opportunity to review the draft programmatic agreement between the DEIS and FEIS.

All action would comply with guidance of the proposed Merced River Plan programmatic agreement. In the event that the programmatic agreement is not completed prior to project initiation, actions will proceed under the guidance of the standard 36 CFR Part 800 consultation regarding consultation with SHPO.

### ***Special Requirements for Protecting National Historic Landmarks***

The ACHP regulations also discuss special requirements for protecting National Historic Landmarks at 36 CFR § 800.10. The Wawona Hotel and Thomas Hill Studio District NHL, for example, is a National Historic Landmark in Segment 7 of the river corridor that would be subject to this rule. National Historic Landmarks are afforded special consideration in planning efforts to minimize harm. This statutory requirement stems from Section 110(f) of the NHPA.

### ***Area of Potential Effect for this Plan***

As defined under the ACHP regulations at 36 CFR 800.16(d), the area of potential effect means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The proposed APE for the *Merced River Plan/DEIS* is larger than the area encompassed by the Merced River corridor to ensure that the effects of all actions proposed under the plan are thoroughly considered. More specifically, the APE extends out 1.5 miles on each side of the river channel and includes the boundaries of the archeological and historic districts that extend outside the boundaries of the 0.25-mile river corridor (**Figure 9-52**).

### ***Environmental Consequences of Alternative 1 (No Action)***

#### **All River Segments**

Under Alternative 1 (No Action), all cultural landscape resources, historic buildings, and structures would continue to be managed as they are today. Alternative 1 also includes rehabilitation or other historic preservation as defined in existing or future plans that address specific structures, such as the Ahwahnee Comprehensive Rehabilitation. Impacts would occur only as a result of ongoing park operations and programs, such as facilities maintenance and repair. For historic buildings, cultural landscapes, and structures, these activities would be subject to the Secretary of the Interior's Standards

for the Treatment of Historic Properties. Under Alternative 1 (No Action), impacts on these resources would be negligible under NEPA criteria. Alternative 1 would have no adverse effect on Register-listed resources under the NHPA.

### **Segment 1: Merced River Above Nevada Fall**

Known historic resources in Segment 1 include the Merced Lake High Sierra Camp Historic District and the Merced Lake Ranger Station. Other resources may exist in the upper reaches of the Merced River drainage, such as structures associated with early stock men. Under Alternative 1 (No Action), impacts on these resources would be negligible under NEPA criteria. Alternative 1 is expected to have no adverse effect on these National Register-listed historic properties in Segment 1.

### **Segment 2: Yosemite Valley**

The Yosemite Valley Historic District is listed on the NRHP in 2006. Several historic sites, structures, and districts throughout the Valley were nominated for the NRHP prior to the Yosemite Valley Historic District nomination. These properties are significant on their own merits as well as contributing to the Yosemite Valley Historic District. **Table 9-211** describes potential impacts to these resources under the No Action Alternative.

Under Alternative 1 (No Action), impacts on the majority of resources would be negligible under NEPA criteria, although there would be minor, segment-wide, adverse impacts to the Yosemite Valley and Yosemite Village Historic Districts. Alternative 1 is expected to have no adverse effect on the majority of National Register-listed historic properties in Segment 2 under NHPA criteria.

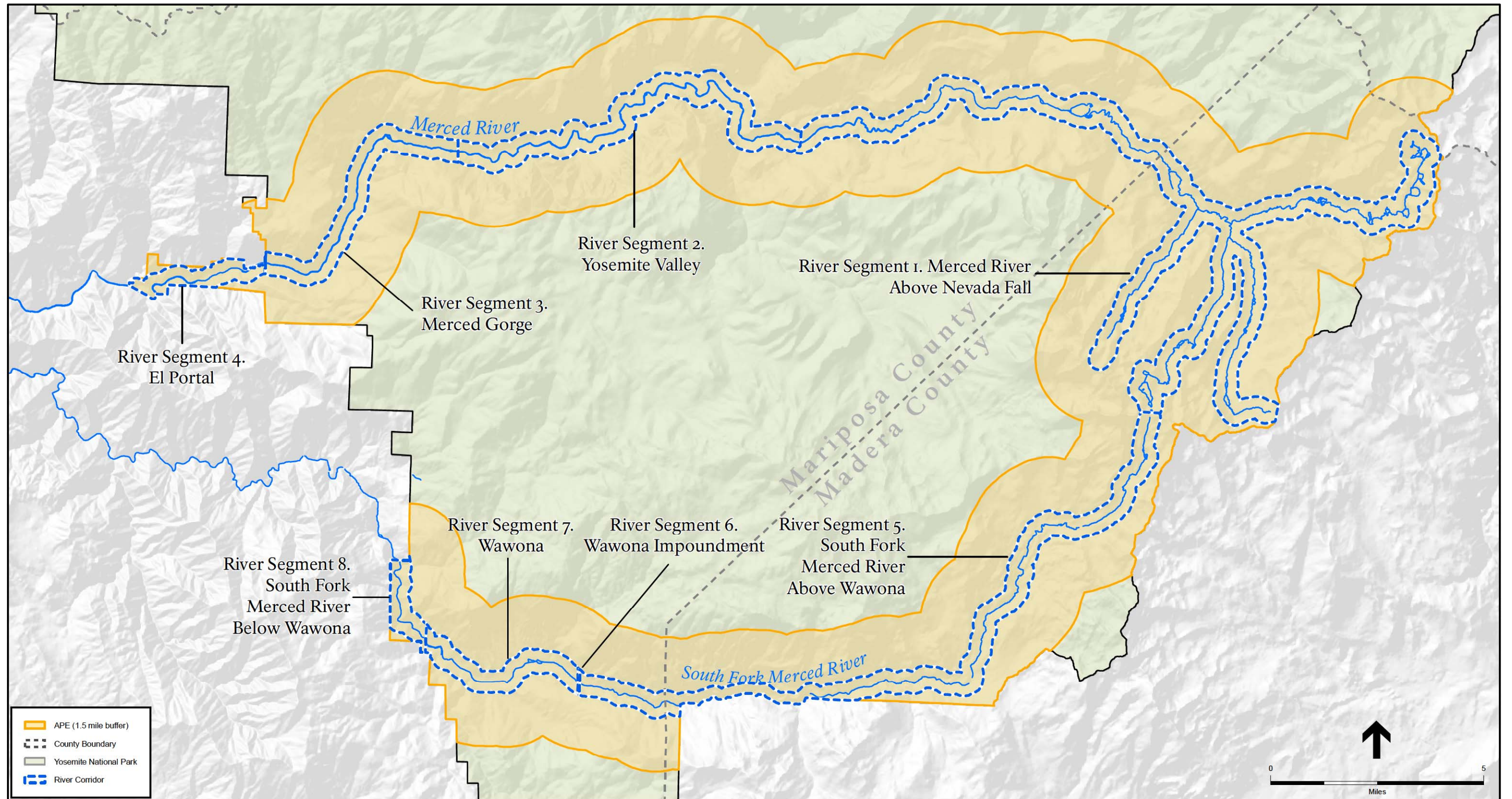
### **Segments 3 and 4: Merced River Gorge and El Portal**

Based on a cultural resources inventory completed in support of the reconstruction of El Portal Road, the NPS, in consultation with the SHPO, determined that the Merced Canyon Travel Corridor is a significant historic resource and is eligible for listing in the NRHP. A preliminary cultural landscape study conducted in El Portal revealed Old El Portal as a potential historic resource within Segment 4, although two other reports have not identified the resource eligible as a district. Both of these segments include several historic sites and structures considered eligible for listing in the NRHP. Under Alternative 1 (No Action), impacts on these resources would be negligible under NEPA criteria. Alternative 1 is expected to have no adverse effect on these National Register-listed historic properties in Segments 3 and 4 under NHPA Criteria.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

Cultural landscape inventories are being conducted for the Wawona area, focusing on Washburn Company holdings (including the Wawona Hotel and Thomas Hill Studio District NHL). This resort complex once encompassed many other facilities necessary to support such a remote facility. The Pioneer Yosemite History Center, on the banks of the South Fork Merced River, contains many structures relocated from other areas of the park. Other structures include the Wawona Covered Bridge, gray barn, slaughterhouse, and laundry, now used as a wagon repair shop. Wilderness areas





SOURCE: NPS, 1997, 2011

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**Figure 9-52**  
Area of Potential Effect

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**TABLE 9-211: ALTERNATIVE 1 IMPACTS TO HISTORIC PROPERTIES IN SEGMENT 2**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159) (Contributing meadows to the Yosemite Valley Historic District include Bridalveil Meadow, El Captain, Slaughterhouse, Sentinel, Leidig, Cook's, Ahwahnee, Stoneman, and Lamon Meadows)	The continued encroachment of conifers into contributing meadows within the Yosemite Valley Historic District would have an adverse effect on the setting of these contributors.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. A history of intensive use and management, as well as the iconic significance of the meadows as elements of Yosemite scenery, make the Yosemite meadows contributing sites in the historic district (NPS 2006d).</p> <p>The encroachment of conifers into historic meadow areas in the Yosemite Valley Historic District would impact the historic setting of the meadows, as well as the potential loss of the meadows as contributing resources, resulting in a long term, moderate adverse impact under NEPA.</p> <p>The encroachment of conifers into historic meadow areas in the Yosemite Valley Historic District would alter the character of the contributing resources, and would result in an adverse effect to the historic district under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District, Yosemite Village Historic District	The continued mothballing of the Superintendent's House would result in an adverse effect to both the Yosemite Valley and Yosemite Village Historic Districts.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Hart, 1978).</p> <p>The Superintendent's Residence and Garage is subject to recurring flooding and subsequent water damage. The building was mothballed following the 1997 floods. The historic interior finishes of the Superintendent's Residence, especially the distinctive plaster work, are in poor condition. Also, structural issues related to settling of the foundation have resulted in displacement of walls and floors. Visitor use in this area has caused radiating informal trails that impact Cook's Meadow. The continued impacts to the Superintendent's House have the potential to diminish the integrity of the Yosemite Valley and Yosemite Village Historic Districts. This action would result in a long term, minor adverse impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p>While the Superintendent's Residence and Garage was mothballed following the 1997 floods, mothballing does not prevent deterioration. The continued mothballing of Residence 1 would result in an adverse effect to the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>



above Wawona contain historic trails. Potential impacts under Alternative 1 (No Action) would include ongoing degradation of resources from visitor and operational use; however, ongoing maintenance and rehabilitation would result in negligible impacts on historic resources. Under Alternative 1, impacts on these resources would be negligible under NEPA criteria. Alternative 1 (No Action) would likely have no adverse effect on these National Register-listed historic properties in Segments 5, 6, 7, and 8 under NHPA Criteria.

### **Summary of Impacts Under No Action Alternative**

Identified historic resources that could be adversely affected by the No Action Alternative include the Yosemite Valley Historic District and the Superintendent's House. These effects include the alteration of character-defining features of these National Register-listed resources through neglect.

### **Cumulative Impacts from Alternative 1 (No-Action)**

#### ***Past Actions***

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include extensive actions to preserve and maintain historic resources, including the Camp Curry Historic District (Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation), as well as restoration of meadows associated with the Yosemite Valley Historic District (Cook's Meadow). Adverse effects include the removal of the NR eligible Cascades area houses.

#### ***Present Actions***

Present actions contribute to a mixture of beneficial and adverse impacts. These impacts include efforts to restore, preserve, and protect the historic integrity and character-defining features of The Ahwahnee NHL while completing long-term rehabilitation of the building and associated features, construction of the Wawona fire station, Camp 4 relocating eight campsites, and the Ahwahnee Hotel Porte Cochère Access Walkways and Fence project. Additionally, the park has established the Yosemite Valley Rockfall Hazard Zone in Curry Village, which has resulted in the loss of historic structures. These structures are being documented under a separate MOA.

#### ***Future Actions***

Impacts from future actions would be similar to those discussed for past and present actions as a mix of beneficial and adverse impacts to historic resources. The Curry Village Rehabilitation of Historic Cabins with Bath Structures, seismic upgrade to the Ahwahnee Dormitory, and efforts to stabilize the floor of the Ahwahnee Hotel, all consist of potential future actions with the potential to affect historic resources within the park.

### ***Overall Cumulative Impact***

There would be no change in the treatment and management of historic buildings, structures, and cultural landscape resources as a result of Alternative 1 (No Action). The results of the neglect in Segment 2 would contribute towards a moderate adverse cumulative effect.

### ***Environmental Consequences Common to Alternatives 2–6***

While discussed separately, actions and impacts common to Alternatives 2–6 are included in the analysis of each subsequent alternative, in addition to actions specific to the individual alternatives.

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Table 9-212 describes impacts of actions intended to protect and enhance river values in all river segments under Alternatives 2-6.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions intended to manage visitor use and facilities that are common to Alternatives 2–6 and would occur across all segments of the river corridor would not be expected to result in an adverse effect on historic resources because these actions would not affect the character-defining features of a historic building, structure, or district.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

Actions common to Alternatives 2–6 that are intended to protect and enhance river values and would occur within Segment 1 would not result in an adverse effect on historic resources because these actions would not affect the character-defining features of a historic building, structure, or district.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions common to Alternatives 2–6 that are intended to manage visitor use and facilities and would occur in Segment 1 would not result in an adverse effect on historic resources because these actions would not affect the character-defining features of a historic building, structure, or district.

#### **Segment 2: Yosemite Valley**

##### ***Impacts of Actions to Protect and Enhance River Values***

Table 9-213 describes impacts of actions intended to protect and enhance river values in Segment 2 under Alternatives 2-6.

**TABLE 9-212: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN ALL RIVER SEGMENTS UNDER ALTERNATIVES 2-6**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
All segments	Actions to Protect and Enhance River Values	Abandoned infrastructure	Throughout the corridor, abandoned underground infrastructure that alters hydrology, including remnants of former sewer treatment facilities, sewer and water line, and manholes, will be removed and the area restored to natural conditions. This may affect historic resources.	Throughout all segments of the Merced Wild and Scenic River corridor, removing abandoned infrastructure has the potential to affect historic resources. These resources have not been previously evaluated for their historic significance, and the loss or demolition of historical resources would be a long term, local, moderate adverse impact, depending on whether the resources are found to be contributors to a historic district or significant in their own right. Park actions to remove abandoned infrastructure throughout the river corridor would be completed subject to the proposed Merced River Plan programmatic agreement (or standard 36 CFR Part 800 consultation) when site-level information is available. Following the determination of site level information, impacts to these properties will be determined per NEPA and NHPA.



**TABLE 9-213: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVES 2-6**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	The Ahwahnee Hotel (1977000149: NHL) ; Yosemite Valley Historic District (2004001159)	Restoring the impacted portion of Ahwahnee Meadow to natural meadow conditions, through removal of tennis courts, irrigation, ditches, and restoration of topography would result in the removal of the tennis courts which are a contributing structure to the Ahwahnee Hotel.	<p>The Ahwahnee, because of its architectural design and pristine condition, is among the most significant park hotels in the country. Its rustic style was designed to reflect its environment, and its significance lies with the preservation of the building and its setting. The Tennis Courts are a contributor to the National Register Ahwahnee Hotel and the Yosemite Valley Historic District, but are located outside the boundary of the National Historic Landmark. The Ahwahnee Meadow is a contributor to the Yosemite Valley Historic District, the National Register listed Ahwahnee Hotel, and the National Historic Landmark Ahwahnee Hotel (Hart 1977; NPS 2006d; Harrison, 1977).</p> <p><i>NEPA:</i> The removal of the tennis courts, a contributing resource to the Yosemite Valley Historic District and Ahwahnee Hotel, would result in to the alteration of the Ahwahnee Hotel and the Yosemite Valley Historic District. The tennis courts and Ahwahnee meadow are parts of the historic setting and landscape of the Ahwahnee Hotel and contribute to its aesthetic and significance. The removal of the tennis courts would, however, result in a beneficial impact through the restoration of an earlier configuration of the historic Ahwahnee Meadow. The action would be taken consistent with mitigation measure HIST-2 and guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The proposed removal of the tennis courts would result in a long term, local, moderate adverse effect to the NR Ahwahnee Hotel and the Yosemite Valley Historic District under NEPA. The restoration of the Ahwahnee Meadow would result in a long term, local, beneficial impact to the NR Ahwahnee Hotel and the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The removal of the tennis courts, a contributing resource to the Yosemite Valley Historic District and Ahwahnee Hotel, would alter both the Yosemite Valley Historic District and NR Ahwahnee Hotel. As described above, the action would be taken consistent with mitigation measure HIST-2 and guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The</p>

**TABLE 9-213: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>				
Segment 2 (cont.)				removal of the tennis courts will result in the diminishment of integrity of the Yosemite Valley Historic District and the NR Ahwahnee Hotel, and would have an adverse effect on the Yosemite Valley Historic District and NR Ahwahnee Hotel under NHPA. The restoration of the Ahwahnee Meadow would have no adverse effect to the Yosemite Valley Historic District and NR Ahwahnee Hotel under NHPA.
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Restoration efforts for meadows contributing to Yosemite Valley Historic District (Cook's, Sentinel, Ahwahnee, Stoneman) would result in no adverse effects to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. The Cook's, Sentinel, Ahwahnee, and Stoneman Meadows are contributing sites to the Yosemite Valley Historic District as characteristic landscape features in the Valley (NPS 2006d).</p> <p>NEPA: The restoration of the meadows to their historic setting would result in a long term, segment-wide, beneficial impact to the Yosemite Valley Historic District under NEPA.</p> <p>NHPA: The restoration of the meadows to their historic setting would improve the condition of a resource and would result in no adverse effect to the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Ditches	Throughout Segment 2, fill 2,155 ' of ditches not serving current operational needs using adjacent berm material or pond and plug techniques.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation (NPS 2006d).</p> <p>The infill of ditches in Segment 2 has the potential to alter historic resources. These ditches have not been previously evaluated as a National Register-eligible resources, and the loss or demolition of historical resources would be a long term, moderate, segment wide, adverse impact, depending on whether the resources are found to be contributors to a historic district or significant in their own right. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to</p>

**TABLE 9-213: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>				
Segment 2 (cont.)				ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. Park actions to fill the ditches would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation when site-level information is available.
<b>Scenic Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	The removal of encroaching conifers from meadows contributing to the Yosemite Valley Historic District (Ahwahnee, Bridalveil, Cook's, Sentinel) would result in no adverse effects to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. The Ahwahnee, Bridalveil, Cook's, and Sentinel Meadows are contributing sites to the Yosemite Valley Historic District as characteristic landscape features in the Valley (NPS 2006d).</p> <p><i>NEPA:</i> The removal of encroaching conifers would help restore the meadows to their historic condition, and would result in a long term, segment-wide, beneficial effect to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The removal of encroaching conifers would help restore the meadows to their historic condition, would improve the condition of a resource and would result in no adverse effect to the Yosemite Valley Historic District under NHPA.</p>

**Biological Resource Actions.** Biological resource actions to protect and enhance river values in Segment 2 under Alternatives 2-6 would result in minor or moderate, local, long term adverse impacts on the listed Yosemite Valley Historic District and Ahwahnee Hotel, as both an individual resource and a contributor to the Yosemite Valley Historic District, under NEPA, and an adverse effect to the Yosemite Valley Historic District and NR Ahwahnee Hotel under NHPA.

**Scenic Resource Actions.** Scenic resource actions to protect and enhance river values in Segment 2 under Alternatives 2-6 would result in long term, segment-wide, beneficial effect to the Yosemite Valley Historic District through restoration of contributing meadows, and no adverse effect to the Yosemite Valley Historic District under NHPA.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-214 describes impacts of actions intended to protect and enhance river values in Segment 2 under Alternatives 2-6.

**Yosemite Village and Housekeeping Camp.** Actions in the Yosemite Village area include the removal of the Ahwahnee tennis courts and pool and redesign and formalization of parking at the Ahwahnee Hotel, redesign of the parking lot and re-routing Northside Drive at Yosemite Village Day-Use Parking area, removal of the Valley Concessioner Garage Building and 4 garages north of Curry Garage, and repurposing of the Yosemite Valley Group Utility Building (Fort Yosemite). As described in table 9-214 below, these actions, other than the Ahwahnee Parking lot redesign, would have a minor to moderate, local, long term adverse impact to the listed Yosemite Valley Historic District under NEPA, and an adverse effect to the Yosemite Valley Historic District, the Yosemite Village Historic District, and the Ahwahnee Hotel under NHPA. The redesign of the Ahwahnee parking lot would have no adverse impact to the Yosemite Valley Historic District or Ahwahnee Hotel under NEPA, and no adverse effect to the Yosemite Valley Historic District or Ahwahnee Hotel under NHPA.

**Yosemite Lodge and Camp 4.** Actions to manage visitor use and facilities in the Yosemite Lodge and Camp 4 areas would include the removal of facilities from the Yosemite Lodge area and construction of a new bus stop, parking area, and campsites near Camp 4. As described in table 9-214 below, Yosemite Lodge was identified as being a non-contributing site within the Yosemite Valley Historic District. However, it has not been evaluated for its post-WWII significance under the 50-year rule for the inventorying of historic properties for the National Register, and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning. Impacts to the Yosemite Valley Historic District through the construction of new facilities within the district near Camp 4 would result in a minor, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA, and no adverse effect under NHPA.

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	The Ahwahnee Hotel (1977000149: NHL); Yosemite Valley Historic District (2004001159)	Retaining the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop would not affect the Ahwahnee Hotel. Removal of the non-contributing pool would not affect the Ahwahnee Hotel. The tennis courts are considered a contributing structure to the Ahwahnee Hotel, and their removal would affect this historic resource.	<p>The Ahwahnee, because of its architectural design and pristine condition, is among the most significant park hotels in the country. Its rustic style was designed to reflect its environment, and its significance lies with the preservation of the building and its setting. The pool is a non-contributor to the Yosemite Valley Historic District, the National Register listed Ahwahnee Hotel, and the National Historic Landmark Ahwahnee Hotel (Harrison, 1977; NPS 2006d).</p> <p><i>NEPA:</i> The retention of existing facilities and removal of the pool would result in no adverse impact to either the NR Ahwahnee Hotel or Yosemite Valley Historic District. The impact of removal of the tennis courts is discussed above in table 9-213. The pool is a non-contributing resource, and its removal would have no effect on the Ahwahnee Hotel or Yosemite Valley Historic District. As described above, the removal of the tennis courts would result in a long term, local, moderate adverse impact to the NR Ahwahnee Hotel and a long term, local, minor adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The retention of existing facilities and the removal of the pool would not alter historic properties. The pool is a non-contributing resource to the Ahwahnee Hotel and Yosemite Valley Historic District, and the continued use of existing facilities would not diminish the integrity of the Ahwahnee Hotel or Yosemite Valley Historic District. The adverse effect of the removal of the tennis courts is described under actions to restore the Ahwahnee Meadow in table 9-213. As described in table 9-213, the removal of the tennis courts would have an adverse effect on the Yosemite Valley Historic District and NR Ahwahnee Hotel through removal of an identified contributing resource.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	The Ahwahnee Hotel (1977000149: NHL); Yosemite Valley Historic District (2004001159)	Redesign and formalize the existing parking lot at the Ahwahnee Hotel, providing for proper drainage to meet hotel needs and replace spaces lost in the rockfall. This would include the construction of a new 50 parking space lot east of the current parking.	<p>The Ahwahnee, because of its architectural design and pristine condition, is among the most significant park hotels in the country. Its rustic style was designed to reflect its environment, and its significance lies with the preservation of the building and its setting. The Ahwahnee Parking area (west) is a contributor to the Yosemite Valley Historic District, and both parking lots are contributors to the National Register listed Ahwahnee Hotel, and the National Historic Landmark Ahwahnee Hotel (Harrison, 1977; NPS 2006d).</p>

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> The Ahwahnee parking lots are contributors to the Ahwahnee Hotel as part of the historic setting, but are not architecturally distinct themselves. The alteration of the parking area has the potential to result in changes to the historic circulation and setting of the hotel. Planning and design efforts would follow the Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration. Planning and design efforts would be planned in order to ensure that the park has attempted to avoid any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA. This action would result in no adverse impact to either the Ahwahnee Hotel NHL or NR, or the Yosemite Valley Historic District under NEPA.</p> <p><i>NEHA:</i> The Ahwahnee parking lots are contributors to the Ahwahnee Hotel as part of the historic setting, but are not architecturally distinct themselves. The alteration of the parking area has the potential to result in changes to the historic circulation and setting of the hotel. Planning and design efforts would follow the Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration. Planning and design efforts would be planned in order to ensure that the park has attempted to avoid any potentially adverse effects to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA. This action would result in no adverse effect to the Ahwahnee Hotel NHL or NR, or the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The relocation of parking to the north of the road and re-routing Northside Drive south of the parking at Yosemite Village Day-Use Parking area would affect historic circulation patterns in the Yosemite Valley Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Northside and Southside drives create a framework for circulation around the valley, on either side of the Merced River, and are contributing structures to the Yosemite Valley Historic District. The historic circulation of Yosemite Village is predominantly centered on Village Drive between Northside Drive and Village bike path (NPS 2006d). Northside Drive is not a contributor to the Yosemite Village Historic District (Donahoe 1994).

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> The relocation of the parking lot will occur within the existing developed former footprint of the Concessioner General Office and the Concessioner Garage. The relocation of an existing parking lot within the existing developed footprint would not result in a significant change to the historic setting of the Yosemite Valley Historic District. The re-routing of Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns and alteration of an identified contributing resource to the Yosemite Valley Historic District. The road realignment will include a small segment of the entire length of Northside Drive. As described above, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The road realignment and relocation of the parking lot will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The relocation of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The relocation of the parking lot to an existing, developed administrative footprint will not alter characteristics that make the Yosemite Valley Historic District eligible for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the district. The relocation of the parking lot will have no adverse effect on the Yosemite Valley Historic District under NHPA. The realignment of Northside Drive would diminish the integrity of the Yosemite Valley Historic District through alteration of historic circulation patterns and alteration of an identified contributing resource to the Yosemite Valley Historic District. The road realignment will include a small segment of the entire length of Northside Drive. As described above, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The road realignment will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Removal of the Concessioner Garage Building and 4 garages north of Curry Garage would result in the loss of 5 contributing buildings to the Yosemite Valley Historic District.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Concessioner Garage Building and 4 garages north of Curry Garage are contributors to the Yosemite Valley Historic District and the Yosemite Village Historic District.</p> <p><i>NEPA:</i> The removal of the Concessioner Garage Building and 4 additional garages north of Curry Garage has the potential to affect alter the Yosemite Valley Historic District. Removal of the buildings would result in the loss of 5 contributing buildings to the district (of 302 and 68 resources, respectively). This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The action would result in a long term, moderate, local adverse impact to Yosemite Valley Historic District and the Yosemite Village Historic District under NEPA.</p> <p><i>NHPA:</i> The removal of the Concessioner Garage Building and 4 additional garages north of Curry Garage has the potential to alter the Yosemite Valley Historic District. Removal of the buildings would result in the loss of 5 contributing buildings to the district. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The demolition or loss of these contributing resources would diminish the integrity of the historic districts. The action will have an adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	Repurposing of the Fort Yosemite building would result in the alteration of the physical structure, affecting a contributing resource to the Yosemite Valley Historic District. The proposed rehabilitation of Buildings 516, 518, and 519 would	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Yosemite Valley Group Utility Building (Fort Yosemite) is a contributor to the Yosemite Valley Historic District, but not the Yosemite Village Historic District (NPS 2006d).</p> <p><i>NEPA:</i> The repurposing of the Yosemite Valley Group Utility Building, a contributor to the Yosemite Valley Historic District, as the location of the</p>



**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)			adhere to the Secretary of the Interior Standards for the treatment of historic properties, and would be accomplished without adverse effects.	<p>Valley Garage has the potential to affect on the Yosemite Valley Historic District. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The physical alteration of the structure would adversely affect the building's integrity of design and infringe upon its ability to convey the historic significance of the district. Major changes to the exterior and interior of the Yosemite Valley Group Utility Building (Fort Yosemite) are proposed, and these changes are likely beyond the allowances of rehabilitation (repairs and alterations for efficient and compatible uses). This will likely result in a long term, moderate, adverse impact on the Yosemite Valley Historic District under NEPA. The following historic buildings are slated for rehabilitation to provide more efficient storage: Building 516 (Yosemite Valley Equipment Area Utility Shed), Building 518 (Yosemite Valley Equipment Area Utility Shed), and Building 519 (Yosemite Valley Equipment Area Utility Shed). Following the Secretary Standards, it may be possible to accomplish this without adverse impacts.</p> <p><i>NHPA:</i> The repurposing of the Yosemite Valley Group Utility Building and three other buildings, all contributors to the Yosemite Valley Historic District, may diminish the integrity of the Yosemite Valley Historic District. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The physical alteration of the structure would adversely affect the building's integrity of design and infringe upon its ability to convey the historic significance of the district. The alteration of the Yosemite Valley Group Utility Building (Fort Yosemite) are likely beyond the allowances of rehabilitation (repairs and alterations for efficient and compatible uses). This will likely result in an adverse effect on the Yosemite Valley Historic District under NHPA. Rehabilitation of Building 516, Building 518, and Building 519 should be undertaken according to the Secretary of the Interior Standards for Rehabilitation. Under these guidelines, the rehabilitation of Buildings 516, 518, and 519 would result in no adverse effect Yosemite Valley Historic District under NHPA.</p>

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Lodge and Camp 4</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Camp 4 (2003000056); Yosemite Valley Historic District (2004001159)	Expansion eastward to provide 40 walk-in sites while retaining 35 campsites at Camp 4 would affect Camp 4 as a historic property as well as its status as a contributing site in the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). Camp 4 is a historically significant site for its association with the growth and development of rock climbing as a recreational activity within the valley. During its period of significance, Camp 4 earned national and international acclaim as the center of modern rock climbing. The approximately 10-acre site served as a place for training, ascent planning, and information and equipment exchange (NPS 2006d; NPS, 2003).</p> <p><i>NEPA:</i> The entirety of the Camp 4 site is considered to be a contributing resource to both the NR site and the Yosemite Valley Historic District, and the expansion of the number of sites has the potential to affect the setting of Camp 4. The site's significance centers on its location as the development of modern rock climbing. While the addition of 40 walk in sites would alter the site's setting, it would not result in an adverse effect to the character defining features and nature of the site. The addition of new facilities within the Yosemite Valley Historic District would be completed under the Yosemite Design Guidelines. The additional sites would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The action would have a long term, minor adverse impact on Camp 4 and the Yosemite Valley Historic District.</p> <p><i>NHPA:</i> The entirety of the Camp 4 site is considered to be a contributing resource to both the NR site and the Yosemite Valley Historic District, and the expansion of the number of sites would alter the setting of Camp 4. The site's significance, however, centers on its location as the development of modern rock climbing. While the addition of 40 walk in sites would alter the site's setting, it would not result in an adverse effect to the character defining features and nature of the site. The addition of new facilities within the Yosemite Valley Historic District would be completed under the Yosemite Design Guidelines. While the action will have an effect on the Yosemite Valley Historic District, the action would</p>

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Lodge and Camp 4 (cont.)</b>				
Segment 2 (cont.)				not alter characteristics that make this district eligible for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the district. The additional sites would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The action would have no adverse effect on Camp 4 and the Yosemite Valley Historic District.
Segment 2	Actions to Manage Visitor Use and Facilities	Camp 4 (2003000056); Yosemite Valley Historic District (2004001159)	Construction along Northside Drive, including a shuttle bus stop, parking for 41 vehicles, and an overflow parking lot for 25 vehicles, all of which is proposed outside the boundary for Camp 4 but within the Yosemite Valley Historic District, would have an affect on the Yosemite Valley Historic District and the setting it provides for Camp 4.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). Camp 4 is a historically significant site for its association with the growth and development of rock climbing as a recreational activity within the valley. During its period of significance, Camp 4 earned national and international acclaim as the center of modern rock climbing. The approximately 10-acre site served as a place for training, ascent planning, and information and equipment exchange (NPS 2006d; NPS, 2003).</p> <p>NEPA: The construction of both the shuttle bus stop and new parking lots on the south side of Northside Drive would occur outside of the site boundary of Camp 4. As described above, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation, and the addition of new facilities within the Yosemite Valley Historic District would be completed under the Yosemite Design Guidelines. The addition of new parking outside of the site boundary would have no adverse effect on Camp 4 and a minor, local, long term adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p>NHPA: The construction of both the shuttle bus stop and new parking lots on the south side of Northside Drive would occur outside of the site boundary of Camp 4. The addition of new facilities within the Yosemite Valley Historic District has the potential to diminish the integrity of setting to the district. As described above, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800</p>

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Lodge and Camp 4 (cont.)</b>				
Segment 2 (cont.)				consultation, and the addition of new facilities within the Yosemite Valley Historic District would be completed under the Yosemite Design Guidelines. While the action will have an effect on the Yosemite Valley Historic District, the action would not alter characteristics that make this district eligible for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the district. The addition of new parking outside of the site boundary would have no adverse effect on Camp 4 and the Yosemite Valley Historic District under NHPA.
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District	In Yosemite Lodge area, the removal of the NPS volunteer office, Yosemite Lodge housing (Thousands Cabins), Housing at Highland Court, Yosemite Lodge Post Office, Yosemite Lodge Pool and Snack Stand has the potential to affect historic resources in the Yosemite Lodge area.	In 1956, the Yosemite Lodge was completely rebuilt and most of the old lodge buildings were demolished. The Yosemite Lodge is almost entirely the product of postwar planning and construction, but has not been evaluated for eligibility as a National Register-eligible resource (NPS 2006d).  The removal of existing buildings in the Yosemite Lodge area could affect historic resources. Yosemite Lodge has not been evaluated for NR eligibility as a Mission 66 resource. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under both NEPA and NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.
<b>Curry Village</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159); Camp Curry Historic District	Replacement of temporary employee housing at Huff House with 16 permanent buildings would affect the historic setting of this area of the Yosemite Valley Historic District, but not the Camp Curry Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). Huff House is a contributing building to the Yosemite Valley Historic District, but is not within the boundaries of the Camp Curry Historic District (NPS 2006d).

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> The introduction of new permanent buildings has the potential to affect the Yosemite Valley Historic District. As described above, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The design and installation of new buildings and facilities would comply with the Yosemite Design Guidelines and NPS cultural resource management guidelines. Any new facilities would be designed to be compatible with the distinctive character of the landscape. These existing guidelines would protect the historic properties by requiring new facilities to be compatible to the maximum extent possible with the historic materials, features, size, scale, proportion, and massing of existing historic resources and Yosemite Valley Historic District as a whole. This action would affect a contributing resource, but would not alter the character-defining feature(s), nor would the action diminish the overall integrity of the historic property. New construction that follows these regulations and guidelines would result in a minor, long term, local adverse impact on the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The introduction of new permanent buildings at Huff House has the potential to alter the Yosemite Valley Historic District. As described above, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation, and installation of new buildings and facilities would comply with the Yosemite Design Guidelines and NPS cultural resource management guidelines. This new construction would result in no adverse effect to Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	Removal of services at the ice skating rink at Curry Village would not result in the loss of a contributing element to the Yosemite Valley Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). The ice rink is a

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p>non-contributing element to the Yosemite Valley Historic District and the Camp Curry Historic District, although the Camp Curry Bike Shop/Skate Rental Building is a contributing building to the Yosemite Valley Historic District (NPS 2006d).</p> <p><i>NEPA:</i> The ice skating rink is a non-contributing resource to the Yosemite Valley and Camp Curry Historic Districts. No associated historic buildings or structures would be removed with this action. If the contributing Camp Curry Bike Shop/Skate Rental Building continues to be used for recreational purposes, there would be no adverse impact on the building. The removal of services at a non-contributing resources under the proposed action would result in a local, long term, beneficial impact to the Yosemite Valley Historic Districts under NEPA.</p> <p><i>NHPA:</i> The ice skating rink is a non-contributing resource to the Yosemite Valley and Camp Curry Historic Districts. No associated historic buildings or structures would be removed with this action. If the contributing Camp Curry Bike Shop/Skate Rental Building continues to be used for recreational purposes, there would be no adverse effect to the contributing building in the Yosemite Valley Historic District. The proposed action would result in no adverse effect to the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	Construction of additional housing or facilities and redesign or repurposing of existing facilities at Yosemite Lodge would result in an alteration to the setting of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation.</p> <p><i>NEPA:</i> The introduction of new permanent buildings or additional parking at Yosemite Lodge has the potential to alter the setting of the Yosemite Valley Historic District. The installation of new buildings and facilities would comply with the Yosemite Design Guidelines and NPS cultural resource management guidelines, and consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or 36 CFR 800 consultation). Any new facilities would be designed to be compatible with the distinctive character of the landscape. These existing guidelines would protect the historic properties by requiring new facilities to be compatible to the maximum extent</p>

**TABLE 9-214: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p>possible with the historic materials, features, size, scale, proportion, and massing of existing historic resources and Yosemite Valley Historic District as a whole. New construction that follows these guidelines would result in a minor, long term, local, adverse impact on historic resources under NEPA.</p> <p><i>NHPA:</i> The introduction of new permanent buildings or additional parking at Yosemite Lodge has the potential to alter the setting of the Yosemite Valley Historic District. The installation of new buildings and facilities would comply with the Yosemite Design Guidelines and NPS cultural resource management guidelines, and consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or 36 CFR 800 consultation). Any new facilities would be designed to be compatible with the distinctive character of the landscape. These existing guidelines would protect the historic properties by requiring new facilities to be compatible to the maximum extent possible with the historic materials, features, size, scale, proportion, and massing of existing historic resources and Yosemite Valley Historic District as a whole. New construction that follows these guidelines would result in a no adverse effect to the Yosemite Valley Historic District under NHPA.</p>

**Curry Village.** Project level actions to manage visitor use and facilities in the Curry Village area would include the replacement of temporary housing at Huff House with 16 permanent buildings and the removal of services at the Curry Village Ice Rink. As described in table 9-214 above, actions to remove existing facilities would result in a long term, local, moderate adverse effect to the Yosemite Valley Historic District under NEPA and an adverse effect under NHPA. Construct new permanent housing would result in a long term, local, minor adverse effect to the Yosemite Valley Historic District under NEPA, and the removal of services at the non contributing ice rink would have no impact to the Yosemite Valley Historic District under NEPA. These actions would result in no adverse effect under NHPA.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### *Impacts of Actions to Protect and Enhance River Values*

Actions intended to protect and enhance river values common to Alternatives 2–6 and located within Segments 3 and 4 would not result in adverse effects on historic resources in El Portal because such actions would not affect the character-defining features of a historic building, structure, or district.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Table 9-215 describes impacts of actions intended to manage visitor use and facilities Segments 3 and 4 under Alternatives 2-6.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### *Impacts of Actions to Protect and Enhance River Values*

Actions intended to protect and enhance river values common to Alternatives 2–6 and located within Segments 5, 6, 7, and 8 would not result in adverse effects on historic resources because such actions would not affect the character-defining features of a historic building, structure, or district.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Table 9-216 describes impacts of actions intended to protect and enhance river values in Segments 5, 6, 7, and 8 under Alternatives 2-6.

### **Summary of Impacts Common to Alternatives 2–6**

Identified historic resources that would be affected by actions common to Alternatives 2–6 include potentially eligible trails and roads, the Yosemite Valley Bridges Historic District, Ahwahnee Hotel NHL, Camp 4, Camp Curry Historic District, Yosemite Village Historic District, Yosemite Valley Historic District (specifically impacts to Curry Village), the Wawona Hotel and Pavillion Historic District, and potential historic resources in El Portal and Wawona. These impacts would include the alteration of character-defining features or historic context, or potential demolition of National Register-listed or eligible resources.



**TABLE 9-215: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 3 AND 4 UNDER ALTERNATIVES 2-6**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 3	Actions to Manage Visitor Use and Facilities	El Portal Historic Structures	The construction of 12 infill housing units in vacant lots in old El Portal to facilitate removal of temporary housing in Yosemite Valley may impact the historic setting of the area.	<p>El Portal is a small community comprised of 1200 acres of land on both the north and south sides of the Merced River and Highway 140. Old El Portal contains several listed and eligible historic resources in the vicinity of the proposed infill (El Portal Chapel, Track Bus No. 19, Bagby Stationhouse, Hetch Hetchy Railroad Engine No. 6, and the Yosemite Valley Railroad Caboose No. 15). Old El Portal has been proposed as a historic district and would be significant under Criterion A due to its role in settlement, industry, and tourism in the Yosemite Region, from 1907-1951. Old El Portal historic district was recommended eligible under Criterion C because of its eclectic assemblage of landscape characteristics, including buildings, structures, land use, spatial organization, cluster arrangements, and circulation (NewFields International, 2005). Additionally, some historic resources in El Portal are considered potentially eligible by the Park, including El Portal Hotel and Motor Inn Historic District, Foresta Road, Rancheria Mission 66 Historic District, and Standard Oil office and bulk fuel storage tanks (NPS 2011r).</p> <p>The construction of new housing in old El Portal has the potential to alter the historic setting of the area. A historic resource study identifying potentially eligible properties in the vicinity of El Portal has been completed by park staff (NPS 2011r). This study provides the park with enough research/information to identify potentially eligible resources that will need further Section 110 inventory/analysis to determine eligibility. A determination of effect under NEPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p> <p>The construction of new housing in old El Portal has the potential to alter the historic setting of the area. A historic resource study identifying potentially eligible properties in the vicinity of El Portal has been completed by park staff (NPS 2011r). This study provides the park with enough research/information to identify potentially eligible resources that will need further Section 110 inventory/analysis to determine eligibility. A determination of effect under NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>

**TABLE 9-215: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 3 AND 4 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 3	Actions to Manage Visitor Use and Facilities	El Portal Historic Structures	The removal or relocation of 36 existing private residences in Abbieville or Trailer Village areas would not impact historic resources in El Portal.	<p>El Portal is a small community comprised of 1200 acres of land on both the north and south sides of the Merced River and Highway 140. The homes in Abbieville were determined unlikely to be individually eligible to be listed on the National Register. The trailer park was built during the Mission 66 era as part of the development intended for transient structures but lacks any distinct qualities to warrant inclusion on the National Register by itself (NPS 2011r).</p> <p>The removal of private residences in Abbieville and Trailer Village would not alter historic resources in the area. These residences were determined unlikely for listing in the National Register, and their removal would result in a no adverse impact under NEPA.</p> <p>The removal of private residences in Abbieville and Trailer Village would not alter historic resources in the area. These residences were determined unlikely for listing in the National Register, and their removal would result in a no adverse effect under NHPA.</p>

**TABLE 9-216: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE FACILITIES IN SEGMENT 7 UNDER ALTERNATIVES 2-6**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7	Actions to Manage Visitor Use and Facilities	Historic Buildings in Wawona	In Wawona Town center, the park plans to construct a 4,500 square foot building and grounds maintenance facility, a 6,800 square foot combined structural and wild land fire station, and a 4,000 square foot roads maintenance facility, and rehabilitate the existing California Conservation Corp (CCC) structures for potential re-use. The construction of new facilities may impact the historic setting of the area, and the reuse of the CCC structures may impact their integrity.	<p>The community of Wawona possesses several historic resources (Hogdon Homestead Cabin, Acting Superintendent's Headquarters, Chris Jorgensen Studio, and Wawona Covered Bridge), all located over .25 miles from the proposed construction site. The CCC structures have not been previously evaluated as a National Register-eligible resources.</p> <p>The construction of new maintenance facilities in Wawona has the potential to alter the historic setting of the area. The installation new facilities and would comply with NPS cultural resource management guidelines and stipulations of the Merced River Plan programmatic agreement or standard 36 CFR Part 800 consultation. Any new facilities design would be compatible with the distinctive character of the landscape and surrounding buildings. These existing and proposed guidelines would protect historic resources by requiring new facilities to be compatible to the maximum extent possible with the historic materials, features, size, scale, proportion, and massing of existing historic properties. New construction that follows these guidelines would minimize adverse impacts on historic resources under NEPA.</p> <p>The CCC structures have not been evaluated for NR eligibility. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under both NEPA and NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.</p>
Segment 7	Actions to Manage Visitor Use and Facilities	Community of Wawona	The removal of shoulder and off-road parking would not affect historic resources.	<p>The community of Wawona possesses several National Register listed and eligible historic resources, and is currently being analyzed as a historic district by the Park, although no formal evaluation has been submitted to SHPO.</p> <p>The prohibition of shoulder and off-road parking would have a beneficial impact on historic circulation patterns for Wawona under NEPA and no adverse effect to historic properties under NHPA.</p>
Segment 7	Actions to Manage Visitor Use and Facilities	Community of Wawona	The redesign of the bus stop at Wawona would not affect historic resources.	<p>The community of Wawona possesses several National Register listed and eligible historic resources, and is currently being analyzed as a historic district by the Park, although no formal evaluation has been submitted to SHPO.</p>

**TABLE 9-216: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE FACILITIES IN SEGMENT 7 UNDER ALTERNATIVES 2-6 (CONTINUED)**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7	Actions to Manage Visitor Use and Facilities	Wawona Hotel and Pavillion Historic District	Following the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Main Hotel, Manager's Cottage, and Annex Building, and Clark Cottage to bring the building to "good" condition would have no adverse effect on historic resources.	<p>The Wawona Hotel and Pavillion Historic District consists of a complex of buildings associated with local and regional significance due to its association with one of the region's earliest settlers, Galen Clark, as well as its connection with the development of transportation routes within the region (Chappell, 1975).</p> <p><i>NEPA:</i> Efforts to follow the recommendations from the Wawona Hotel Historic Structures Report for improving the condition of historic structures associated with the Wawona Hotel will result in a long term, local, beneficial impact to the Wawona Hotel structures under NEPA.</p> <p><i>NHPA:</i> Efforts to follow the recommendations from the Wawona Hotel Historic Structures Report for improving the condition of historic structures associated with the Wawona Hotel will result in a no adverse effect to the Wawona Hotel structures under NHPA.</p> <p>The redesign of the bus stop would comply with Yosemite Design Guidelines. Any new facilities would be designed to be compatible with the distinctive character of the landscape and surrounding buildings. These guidelines would protect historic resources by requiring new facilities to be compatible to the maximum extent possible with the historic materials, features, size, scale, proportion, and massing of existing historic properties. New construction that follows these guidelines would avoid adverse impacts on historic resources under NEPA and result in no adverse effect under NHPA.</p>

## ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values across all segments that are proposed for Alternative 2 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

There are no actions to manage visitor use and facilities across all river segments proposed for Alternative 2 that would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

There are no actions to protect and enhance river values within Segment 1 proposed for Alternative 2 that would result in an adverse effect on historic resources; no actions would affect the character-defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-217 describes impacts of actions intended to manage visitor use and facilities in Segment 1 under Alternative 2.

Actions to manage visitor use and facilities in Segment 1 under Alternative 2 would result in a major, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District (Merced Lake High Sierra Camp Historic District) under NEPA and an adverse effect on Merced Lake High Sierra Camp Historic District under NHPA through the removal and delisting the Merced Lake High Sierra Camp Historic District from the National Register. No NHL would be affected.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Table 9-218 describes impacts of actions intended to protect and enhance river values in Segment 2 under Alternative 2.

**TABLE 9-217: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 1 UNDER ALTERNATIVE 2**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 1	Actions to Manage Visitor Use and Facilities	Merced Lake High Sierra Camp Historic District	The closure of the Merced Lake High Sierra Camp and conversion of the area to designated wilderness. This would result in the loss of the Merced Lake High Sierra Camp.	<p>The Merced Lake High Sierra Camp is considered significant in recreation and education as one of seven high country camps whose origin dates back to the earliest days of the National Park Service. The Yosemite camp system initially began in 1916 as an effort to attract people into the park's high country. Through the use of organized parties guided by a Yosemite naturalist, the Park Service established a unique pattern of interpretive service in the high country of one of the most populous national parks, which helped acquaint the American public with the conservation objectives of the agency in all natural areas of the system (Criterion A) (Kirk, 2004).</p> <p><i>NEPA:</i> The alteration or removal of historic period buildings and structures in the Merced Lake High Sierra Camp area would affect the Merced Lake High Sierra Camp Historic District. The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. The demolition of an eligible historic resource represents a substantial and highly noticeable change in character-defining features and the permanent alteration of the historic setting and character of the segment. While the action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation), the proposed action would result in a major, long term, local adverse impact on the district under NEPA through the removal and delisting the Merced Lake High Sierra Camp Historic District from the National Register.</p> <p><i>NHPA:</i> The alteration or removal of historic period buildings and structures in the Merced Lake High Sierra Camp area would affect the Merced Lake High Sierra Camp Historic District. The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. The demolition of an eligible historic resource represents a substantial and highly noticeable change in character-defining features and the permanent alteration of the historic setting and character of the segment. While the action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation), the proposed action would result in an adverse effect on Merced Lake High Sierra Camp Historic District under NHPA through the removal and delisting the Merced Lake High Sierra Camp Historic District from the National Register.</p>

**TABLE 9-218: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 2**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Removal of historic Ahwahnee Row and Tecoya Housing buildings would result in loss of 21 contributing resources to the Yosemite Valley Historic District and Yosemite Village Historic District	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). Structures in Lower Tecoya include dormitories, apartments and associated laundry rooms, the Ahwahnee Row Houses, small cottages, cabins, and curvilinear roads connects the housing units. The Ahwahnee Row Houses are a group of one-and two-story residences built in the 1920s on the east side of Lower Tecoya, and form a boundary between a densely developed and coniferous Lower Tecoya area and the open Ahwahnee meadow. To the west of the row houses are four three-story wood dormitory buildings and an adjacent kitchen facility. Half of the dormitories in Lower Tecoya were constructed in the late 1920s and significantly altered in the 1930s, while the other half were constructed in the 1930s and remain unchanged.</p> <p><i>NEPA:</i> The Tecoya concessioner housing area and Ahwahnee Row houses are contributors to both the National Register-listed Yosemite Valley and Yosemite Village Historic Districts. These buildings reflect the rustic architecture characteristic of Yosemite Village, and their loss would result in an adverse impact on this historic resource. These buildings constitute 21 of the 302 contributing buildings within the Yosemite Valley Historic district (with 929 total contributing resources) and 68 contributing buildings to the Yosemite Village Historic District. While the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or 36 CFR 800 consultation), the proposed action would result in a moderate, long term, local, adverse impact to both the Yosemite Valley Historic District and the Yosemite Village Historic District under NEPA.</p> <p><i>NHPA:</i> The Tecoya concessioner housing area and Ahwahnee Row houses are contributors of the National Register-listed Yosemite Valley Historic District, and their removal or demolition would result in an adverse effect on this historic resource. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or 36 CFR 800 regulations). The alteration of or demolition of these contributing resources would potentially diminish the integrity of the Yosemite Valley and Yosemite Village Historic Districts. The action would have an adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>

**TABLE 9-218: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	The restoration of Stoneman Meadow including the re-alignment of Southside Drive would affect historic circulation patterns in the Curry Village Area of the Yosemite Valley Historic District. This action would, however, improve Stoneman Meadow, another contributor to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). The historic circulation of Camp Curry is predominantly pedestrian, with vehicular approaches from the west (Old Village) and northwest (Stoneman Bridge). Today vehicular access is limited mainly to the northwestern approach, and the western approach has been converted to parking and foot trail. Since the original entry was oriented to this entrance, the historic gateway has become somewhat obsolete, at least in the current circulation configuration. Stoneman Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley, as is Southside Drive (NPS 2006d). Southside Drive is not considered a contributor to the Camp Curry Historic District (Hart, 1979). Boys town is not included in the Camp Curry Historic District nomination.</p> <p><i>NEPA:</i> The realignment of Southside Drive through Boys Town would affect the Yosemite Valley Historic District through alteration of historic circulation patterns in Curry Village and in the Valley. The action will not, however, result in an adverse effect to the historic approach to the Curry Village area, which is the focus of remaining historic vehicular circulation. The road realignment will include a small segment of the entire length of Southside Drive, in an area not out of character with its existing route. Additionally, the restoration of Stoneman Meadow to a more historic setting would have a beneficial effect on the Yosemite Valley Historic District. Finally, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p>



**TABLE 9-218: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>				
Segment 2 (cont.)				<i>NHPA:</i> The realignment of Southside Drive through Boys Town would affect the Yosemite Valley Historic District through alteration of historic circulation patterns. As described above, the action will not result in an adverse effect to the historic approach to the Curry Village area, but will alter Southside Drive, a contributor to the Yosemite Valley Historic District. The restoration of Stoneman Meadow to a more historic setting would improve the condition of the Yosemite Valley Historic District. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in an adverse effect to the Yosemite Valley Historic District under NHPA.
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Rerouting the Valley Loop Trail through Slaughterhouse Meadow has the potential to affect both these contributors to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Valley Loop Trail is one of the primary trails originating in the valley. The Valley Loop Trail dates from the 1920s and was originally built as a bridle trail, generally aligned along existing circulation routes. Thirteen additional miles were added to the Valley Loop Trail in 1928, requiring the construction of 14 bridges. Today, the Valley Loop Trail includes the entire remaining bridle trail system in the valley and it is approximately 21 miles long (Criterion A). The Slaughterhouse Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p><i>NEPA:</i> Both the Valley Loop Trail and Slaughterhouse Meadow are contributors to the National Register-listed Yosemite Valley Historic District. Rerouting the Valley Loop Trail could alter both of these resources. Any sections of Valley Loop Trail that would be rerouted would require additional analysis prior to construction or demolition. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). A determination of effect under both NEPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>

**TABLE 9-218: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>				
Segment 2 (cont.)				<i>NHPA</i> : Both the Valley Loop Trail and Slaughterhouse Meadow are contributors to the National Register-listed Yosemite Valley Historic District. Rerouting the Valley Loop Trail could alter this historic resource. Any sections of Valley Loop Trail that would be rerouted would require additional analysis prior to construction or demolition. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The alteration of the Valley Loop Trail would alter a contributing resource to the Yosemite Valley Historic District, potentially resulting in the diminishment of the district's integrity. A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.
<b>Hydrologic/Geologic Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Bridges Historic District (1977000160); Yosemite Valley Historic District (2004001159)	Removal of Stoneman Bridge, redesign of Sentinel intersection, removal of the Ahwahnee and Sugar Pine Bridges, and restoration to natural conditions would remove contributing structures to the Yosemite Valley Bridges and Yosemite Valley Historic Districts.	<p>Bridges have been a major component of the cultural landscape of the Yosemite Valley from the first years of non-indigenous settlement. The Yosemite Valley Bridges Historic District consists of 8 granite-faced, concrete arch road bridges on the Valley floor, constructed between 1921 and 1933. The Valley bridges are unique for their architectural design and aesthetic considerations, representing an effort to build structures in the national parks which are simple and uniform in design to blend in with the environment (Criterion C) (Wilson, 1977). This bridge is also a contributor to the Yosemite Valley Historic District.</p> <p><i>NEPA</i>: The demolition and removal of Stoneman, Ahwahnee, and Sugar Pine Bridges would affect the Yosemite Valley Historic District and the Yosemite Valley Bridges Historic District. The loss of the bridges would result in the loss of nearly half of the contributing resources in the National Register-listed Yosemite Valley Bridges Historic District. This would also result in the loss of several of the major Merced River crossings affecting the integrity of the historic circulation patterns in the Yosemite Valley Historic District. The action would be implemented with either the proposed Merced River Plan programmatic agreement or standard 36 CFR Part 800 consultation. The proposed actions would result in a major, segment-wide term, local, adverse impact on the Yosemite Valley Bridges</p>

**TABLE 9-218: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions (cont.)</b>				
Segment 2 (cont.)				<p>Historic District and a moderate, long term, segment-wide, adverse impact the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The demolition and removal of Stoneman, Ahwahnee, and Sugar Pine Bridges would result in the loss of nearly half of the contributing resources in the National Register-listed Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District. This action would be implemented with either the proposed Merced River Plan programmatic agreement or standard 36 CFR Part 800 consultation. The action will result in the loss of contributing resources to both the Yosemite Valley and Yosemite Bridges Historic Districts. The action will have an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA.</p>
<b>Cultural Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Rehabilitation of the Superintendent's House per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) would result in an beneficial impact to a contributor to the Yosemite Valley and Yosemite Village Historic Districts.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The stabilization of the building within the would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>NHPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The action will have no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>

**Programmatic Management Actions.** Programmatic resource actions to protect and enhance river values in Segment 2 under Alternative 2 would result in long term, moderate, local, adverse impact to both the Yosemite Valley Historic District and the Yosemite Village Historic District under NEPA through impacts to the contributing resources of Ahwahnee Row Housing and Tecoya Housing buildings, and an adverse effect on both districts under NHPA. No NHL would be affected.

**Biological Resource Actions.** Biological resource actions to protect and enhance river values in Segment 2 under Alternative 2 would result in minor or moderate, local, long term adverse impacts on the listed Yosemite Valley Historic District under NEPA through impacts to the contributing resources of Stoneman Meadow, Southside Drive, Boys Town, Valley Loop Trail, and Slaughterhouse Meadow, and adverse effects to the Yosemite Valley Historic District under NHPA. No NHL would be affected.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions to protect and enhance river values in Segment 2 under Alternative 2 would result in a major, long term, local, adverse impact on both the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA, and an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA through impacts to the contributing resources of Sugar Pine Bridge, Ahwahnee Bridge, Stoneman Bridge. No NHL would be affected.

**Cultural Resource Actions.** Cultural resource actions to protect and enhance river values in Segment 2 under Alternative 2 would result in a moderate, long term, local, beneficial impact on the Yosemite Valley and Yosemite Village Historic Districts under NEPA, and no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA through impacts resulting from the stabilization of the contributing resource of the Superintendent's House. No NHL would be affected.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Table 9-219 describes impacts of actions intended to manage visitor use and facilities in Segment 2 under Alternative 2.

**Curry Village.** Project level actions to manage visitor use and facilities in the Curry Village area would include the replacement of 90 tent cabins and 14 cabins without baths in Boys Town with 78 new hard-sided units. Programmatic actions to manage visitor use and facilities include the removal and ecological restoration of the Curry Village Stables and the redesign of the Curry Orchard Parking area. As described in table 9-219 below, actions to remove housing would result in a long term, local, major adverse impact to both the Camp Curry Historic District and Yosemite Valley Historic District under NEPA, and actions to remove the stables and redesign the parking area would result in a long term, major, local, adverse impact to the Yosemite Valley Historic District under NEPA. These actions would result in an adverse effect under NHPA.

**Yosemite Lodge and Camp 4.** Project level actions to manage visitor use and facilities in the Yosemite Lodge and Camp 4 areas would include the conversion of Yosemite Lodge from lodging to day use, which would include the redesign of parking areas, removal of existing buildings and facilities, conversion of Highland Court area to walk-in campground, construction of new employee housing, and repurposing of existing buildings. As described in table 9-219 below, Yosemite Lodge was identified as being a non-contributing site within the Yosemite Valley Historic District. However, it

**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Construction of additional housing or facilities would result in an alteration to the setting of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation.</p> <p>The introduction of new permanent buildings, facilities, or additional parking has the potential to alter the setting of the Yosemite Valley Historic District. This includes actions such as increased parking at Lost Arrow and camping at Upper Pines. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p>
<b>Curry Village</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The replacement of 90 tent cabins and 14 cabins without baths in Boys Town with 78 new hard-sided units (duplex/fourplex) would remove all 73 contributing historic canvas tent cabins (5 to be relocated), 14 (of 16) contributing historic bungalows.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). The tents are contributors due to their style and distribution over the landscape as they contribute to the historic character of the district. While contributors to the Yosemite Valley Historic District, the 16 Boys Town employee tents (and 73 Camp Curry Employee Canvas Cabins) on the north side of the road do not create an important space in the overall organization of the Camp Curry developed area, although it does possess its own, distinctive character (NPS 2006d).</p>

**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> The removal of tent cabins and cabins from Boys Town would affect the Yosemite Valley Historic District. The loss of these buildings would alter the historic setting of Yosemite Valley Historic District. The loss of the cabins would result in the loss of 14 of 302 contributing buildings to the Yosemite Valley Historic District, and 73 of the over 600 contributing structures (of 902 total contributing resources). Mitigation will be consistent with that proposed in the Curry Village Rockfall Hazard MOA, including updating the National Register Nomination forms for both the Yosemite Valley Historic District and the Camp Curry Historic District to reflect changes to the districts, landscape and architectural documentation of Curry Village, salvage of materials where ever possible, and the preparation of interpretive materials. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in a long term, local, major adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The removal of tent cabins and cabins from Boys Town would alter the Yosemite Valley Historic District. The loss of the cabins would result in the loss of 14 of 302 contributing buildings to the Yosemite Valley Historic District, and 73 of the over 600 contributing structures (of 902 total contributing resources). This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan as well as the Historic Preservation Treatment Procedures outlined in Appendix J. Mitigation will be consistent with that proposed in the Curry Village Rockfall Hazard MOA, including updating the National Register Nomination forms for both the Yosemite Valley Historic District and the Camp Curry Historic District to reflect changes to the districts, landscape and architectural documentation of Curry Village, salvage of materials where ever possible, and the preparation of interpretive materials. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>

**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The re-design of the Curry Orchard Day Use Parking area and extension of the boardwalk through to Curry Village would result in the removal of historic trees and alteration of a contributor to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). In 1927, the Park addressed a growing problem with parking by converting a nearby apple orchard into a unique parking area for Curry Village. Curry Orchard Day Use Parking area is a contributing site to the Yosemite Valley Historic District, but not the Camp Curry Historic District (NPS 2006d; Hart, 1979).</p> <p><i>NEPA:</i> Efforts to redesign parking within the Curry Orchard parking lot would affect a contributing site to the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action would result in a long term, local, moderate adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> Efforts to redesign parking within the Curry Orchard parking lot would alter a contributing resource to the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>

**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	Ecologically restoring the Curry Village Stables area and removal of associated housing would result in removal of the following historic buildings and structures: Concessioner Stables Office, Horse Stable, Mule Barn, Linen Building, Tack Building, Harness Shop, Blacksmith Shop, Comfort Station, Pony Tack Shed #1 and #2, Employee Residence, Employee Cabins (5), Corral, Feeders, and Fence.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. In 1927, the massive stable complex known as Kenneyville was removed to make way for the Ahwahnee Hotel, and a new, smaller stable complex was built to replace it. Now located farther east near the Lamon Orchard, today Kenneyville stables (or Concessioner stables) includes a mule barn, horse stable, five associated support buildings, six employee housing units and a comfort station. With the corrals and fencing through the complex, the cluster remains with good integrity (NPS 2006d).</p> <p><i>NEPA:</i> The removal of the concessioner stables and associated buildings would affect the Yosemite Valley Historic District through the removal of 16 contributing buildings out of 302 contributing buildings, and 3 contributing sites out of 611 contributing sites, within the district (with 929 total contributing resources). The concessioner stables are the only contributing historic stables within the Yosemite Valley Historic District. The loss of these buildings would result in a clearly detectable change Yosemite Valley Historic District. This action would comply with the guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in a long term, moderate, local, adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The removal of the concessioner stables and associated buildings would have the potential to alter the Yosemite Valley Historic District through the removal of the only contributing historic stables within the Yosemite Valley Historic District. The removal of the stables would result in the diminishment of the integrity of the Yosemite Valley Historic District. This action would comply with the guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>



**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	Removal of the Concessioner Headquarters Building would result in the loss of a contributing element to the Yosemite Valley Historic District.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Concessioner Headquarters Building is a contributor to the Yosemite Valley Historic District, but not the Yosemite Village Historic District (NPS 2006d).</p> <p><i>NEPA:</i> The Concessioner Headquarters Building is a contributor to both the National Register-listed Yosemite Valley Historic District. This building reflects the rustic architecture characteristic of Yosemite Village area, and its loss would result in an effect on the Yosemite Valley Historic District. While the action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan, the proposed action would result in a moderate, long term, local, adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The Concessioner Headquarters Building is a contributor to both the National Register-listed Yosemite Valley Historic District. This building reflects the rustic architecture characteristic of Yosemite Village area, and its loss would alter the Yosemite Valley Historic District. This action would comply guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The loss of this contributing resource to a historic district would result in an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	The Ahwahnee Hotel (1977000149: NHL); Yosemite Valley Historic District (2004001159);	Retaining the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop would not affect the Ahwahnee Hotel Removal of the non-contributing pool would not affect the Ahwahnee Hotel.	<p>The Ahwahnee, because of its architectural design and pristine condition, is among the most significant park hotels in the country. Its rustic style was designed to reflect its environment, and its significance lies with the preservation of the building and its setting. The pool is a non-contributor to the Yosemite Valley Historic District, the National Register listed Ahwahnee Hotel, and the National Historic Landmark Ahwahnee Hotel (Harrison 1977; NPS 2006d).</p> <p><i>NEPA:</i> The pool is a non-contributor to the Yosemite Valley Historic District, the National Register listed Ahwahnee Hotel, and the National</p>

**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				<p>Historic Landmark Ahwahnee Hotel. The proposed action would result in no impact to the Ahwahnee Hotel under NEPA.</p> <p><i>NHPA:</i> The pool is a non-contributor to the Yosemite Valley Historic District, the National Register listed Ahwahnee Hotel, and the National Historic Landmark Ahwahnee Hotel. The proposed action would result in no adverse effect to the Ahwahnee Hotel under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Housekeeping Camp	Removal of all lodging units at Housekeeping Camp would potentially result in the removal of a historic resource.	<p>The Housekeeping Camp area developed after 1942, and consists of closely sited, rustic cinderblock and canvas tent cabins. Service buildings include a camp store and laundry and shower facilities, all built after 1942. This area has not been evaluated for eligibility as a National Register-eligible resource.</p> <p>The removal of all lodging units at Housekeeping Camp from within the 100-year floodplain could affect historic resources. Housekeeping Camp has not been previously evaluated as a National Register-eligible resource. Removal of the facilities in these locations would potentially result in an adverse effect. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance consistent with guidance to be established through development of a programmatic agreement for the proposed Merced River Plan PA and a determination of or standard 36 CFR Part 800 consultation. A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Relocation of the Superintendent's House and garage to the NPS housing area and restoration of the area to natural conditions would result in an adverse effect to a	Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). the Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).

**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)			contributor to the Yosemite Valley and Yosemite Village Historic Districts. This will occur in addition to the rehabilitation actions described above.	<p><i>NEPA:</i> The relocation of the Superintendent's House and garage from its historic location has the potential to alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of a building from its historic location results in the loss of historic contextual setting, and can result in the delisting of the resource from the National Register. Additionally, the introduction of the Superintendent's House and garage to a new location has the potential to alter the setting of historic resources in that location as well. The relocation of a buildings within the Yosemite Valley and Yosemite Village Historic Districts would result in a long term, major, local, adverse impact.</p> <p><i>NHPA:</i> The relocation of the Superintendent's House and garage from its isolated historic location would alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of the buildings would result in the loss of historical setting of the resource, resulting in the building no longer being eligible for the National Register. Additionally, the introduction of the Superintendent's House and garage to a new location would alter the setting of historic resources in that location as well. The action will have an adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>
<b>Yosemite Lodge and Camp 4</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Lodge	The removal of buildings in the Yosemite Lodge complex from the 100-year floodplain has the potential to affect historic resources in the Yosemite Lodge area.	<p>In 1956, the Yosemite Lodge was completely rebuilt and most of the old lodge buildings were demolished. The Yosemite Lodge is almost entirely the product of postwar planning and construction, but has not been evaluated for eligibility as a National Register-eligible resource (NPS 2006d).</p> <p>The removal of existing buildings in the Yosemite Lodge and repurposing of the site as a day use area could adversely affect historic resources. Yosemite Lodge has not been evaluated for NR eligibility as a Mission 66 resource. The park will complete a Determination of Eligibility prior to</p>

**TABLE 9-219: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Lodge and Camp 4 (cont.)</b>				
Segment 2 (cont.)				implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under both NEPA and NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.

has not been evaluated for its post-WWII significance under the 50-year rule for the inventorying of historic properties for the National Register, and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning. Impacts to the Yosemite Valley Historic District through the construction of new facilities within the district would result in a minor, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA, and an adverse effect under NHPA.

**Yosemite Village and Housekeeping Camp.** Actions in the Yosemite Village area include the relocation and formalization of the parking lot and re-routing Northside Drive at Yosemite Village Day-Use Parking area, and the relocation of the Superintendent's House and ecological restoration of the area. As described in table 9-219 above, these actions would have a minor to moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA, and an adverse effect to the Yosemite Valley Historic District under NHPA.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-220 describes impacts of actions intended to manage visitor use and facilities in Segments 3 and 4 under Alternative 2.

Actions to protect and enhance river values in Segments 3 and 4 under Alternative 2 would result in negligible, long term, local adverse impacts on historic resources in El Portal under NEPA.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values manage Segments 5, 6, 7, and 8 under Alternative 2 would result in an adverse effect on historic resources. None of these actions would affect the character defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-221 describes impacts of actions intended to manage visitor use and facilities in Segments 5, 6, 7 and 8 under Alternative 2.

**TABLE 9-220: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 3 AND 4 UNDER ALTERNATIVE 2**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 4	Actions to Manage Visitor Use and Facilities	El Portal	The construction of additional concessioner housing in the Rancheria area of El Portal has the potential to alter the historic setting of potential historic resources in El Portal.	<p>El Portal is a small community comprised of 1200 acres of land on both the north and south sides of the Merced River and Highway 140. In 1961 the National Park Service began building housing in Rancheria Flat, west of El Portal as part of the Mission 66 initiative in the National Park Service. The Rancheria Mission 66 area has been recommended as a historic district as part of a historic resource study identifying potentially eligible properties in El Portal, but has not yet received SHPO concurrence (NPS 2011r).</p> <p>The construction of new housing in the Rancheria area of El Portal has the potential to alter the historic setting of the area and any potential historic resources not currently eligible or listed by the Park. A historic resource study identifying potentially eligible properties in the vicinity of El Portal has been completed by park staff (NPS 2011r). This study provides the park with enough research/information to identify potentially eligible resources that will need further Section 110 inventory/analysis to confirm eligibility before forwarding to the SHPOs office for review and concurrence.</p>

**TABLE 9-221: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 5, 6, 7 AND 8 UNDER ALTERNATIVE 2**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7	Actions to Manage Visitor Use and Facilities	Pioneer Yosemite History Center; Wawona Hotel and Pavilion District; Wawona Hotel and Thomas Hill Studio National Historic Landmark	The closure of the stables in Wawona, along with the removal of the Wawona Golf Course, would affect contributors to the NR Wawona Hotel and Pavilion Historic District or Wawona Hotel and Pioneer Yosemite History Center.	<p>The Wawona Hotel and Pavilion's architectural importance to American architecture is as the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity (Criterion C). The Wawona Golf Course, in operation since 1918 and golf course is not currently identified as a contributing resource as identified into either the Wawona Hotel Complex Cultural Landscape Report completed in 2012. A Cultural Landscape Inventory completed for the Pioneer Yosemite History Center includes the Wawona Stables as a contributing resource.</p> <p><i>NEPA:</i> The closure of the Wawona stables and removal golf course would alter both the Pioneer Yosemite History Center and the Wawona Hotel and Pavilion Historic District. The golf course and Wawona Meadow are parts of the historic setting and landscape of the Wawona Hotel and Pavilion and contribute to its aesthetic and significance. The removal of the golf course would result in a beneficial impact through the restoration of an earlier configuration of the historic Wawona Meadow. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground., but would also affect the historic setting of the Wawona Hotel and Thomas Hill Studio National Historic Landmark. A DOE is currently underway through a Cultural Landscape Inventory for the region. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The actions would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The proposed action would result in a long term, local, moderate adverse effect to the Wawona Hotel and Pavilion Historic District and a long term, local, minor adverse effect Pioneer Yosemite History Center under NEPA.</p>

**TABLE 9-221: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 5, 6, 7 AND 8 UNDER ALTERNATIVE 2 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7 (cont.)				<i>NHPA</i> : The closure of the Wawona stables and removal golf course would alter both the Pioneer Yosemite History Center and the Wawona Hotel and Pavilion Historic District. The golf course and Wawona Meadow are parts of the historic setting and landscape of the Wawona Hotel and Pavilion and contribute to its aesthetic and significance. The removal of the golf course would result in a beneficial impact through the restoration of an earlier configuration of the historic Wawona Meadow. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground. The actions would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The action would have an adverse effect on the Wawona Hotel and Pavilion Historic District and no adverse effect on the Pioneer Yosemite History Center under /NHPA.



Actions to protect and enhance river values in Segments 5, 6, 7 and 8 under Alternative 2 would result in moderate, long term, local adverse impacts on the Wawona Hotel and Pavilion Historic District and a negligible, local, adverse effect on the Pioneer Yosemite History Center under NEPA, and an adverse effect on the Wawona Hotel and Pavilion Historic District and no adverse effect on the Pioneer Yosemite History Center under /NHPA.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Some of the management actions proposed under Alternative 2 would affect known historic resources through demolition, alteration, and relocation related to restoration, construction, and facilities removal. Identified historic resources that would be affected by Alternative 2 include the Merced Lake High Sierra Camp, Camp Curry Historic District, the Yosemite Valley Historic District, the Yosemite Valley Bridges Historic District, the Yosemite Village Historic District, and the Wawona Hotel and Pavilion Historic District. **Table 9-222** summarizes the impacts to these historic resources. These impacts would include altering character-defining features or historic context, or potentially demolishing National Register-listed or eligible resources. These actions could have long-term, negligible to major adverse effects on individual historic buildings and sites, and minor to moderate impacts on historic districts under NEPA. The proposed demolition of the Merced Lake High Sierra Camp Historic District would result in an adverse effect under NHPA, and alteration of contributing resources to the Yosemite Valley, Yosemite Village, Yosemite Bridges, and Camp Curry Historic Districts would potentially diminish the integrity of these resources, resulting in an adverse effect under NHPA.

### **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

#### ***Past Actions***

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include extensive actions to preserve and maintain historic resources, including the Camp Curry Historic District (Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation), as well as restoration of meadows associated with the Yosemite Valley Historic District (Cook's Meadow). Adverse effects include the removal of the NR eligible Cascades area houses.

#### ***Present Actions***

Present actions contribute to a mixture of beneficial and adverse impacts. These impacts include efforts to restore, preserve, and protect the historic integrity and character-defining features of The Ahwahnee NHL while completing long-term rehabilitation of the building and associated features, construction of the Wawona fire station, Camp 4 relocating eight campsites, and the Ahwahnee Hotel Porte Cochère Access Walkways and Fence project. Additionally, the park has established the Curry Village Rockfall Hazard Zone, which has resulted in the loss of historic structures. These structures are being documented under a separate MOA.

**TABLE 9-222: IMPACT SUMMARY TO HISTORIC RESOURCES UNDER ALTERNATIVE 2**

Historic District	Types of Impacts	Overall Impact Summary (NEPA)	Overall Impact Summary (NHPA)
Merced Lake High Sierra Camp Historic District	Demolition of contributing resources and potential delisting of the district	long term, major, local, adverse impact	Adverse effect
Camp Curry Historic District	Demolition of contributing buildings.	long term, moderate, local, adverse impact	Adverse effect
NR Ahwahnee Hotel	Removal of contributing resources, addition of new facilities	long term, moderate, local, adverse impact	Adverse effect
Camp 4	Construction of additional campsites, parking, and facilities	long term, minor, local, adverse impact	No adverse effect
Yosemite Valley Historic District	Rerouting of historic roads and trails, removal of historic buildings and facilities, construction of new buildings and facilities,	long term, moderate or major, local, adverse impact	Adverse effect
Yosemite Valley Bridges Historic District	Demolition of historic bridges	long term, major, local, adverse impact	Adverse effect
Yosemite Village Historic District	Relocation and removal of historic buildings	long term, moderate or major, local, adverse impact	Adverse effect
Wawona Hotel and Pavilion Historic District	Removal of contributing resources	long term, moderate, local, adverse impact	Adverse effect
Pioneer Yosemite History Center	Closure of operations at a contributing site	long term, minor, local, adverse impact	No adverse effect

### ***Future Actions***

Impacts from future actions would be similar to those discussed for past and present actions as a mix of beneficial and adverse impacts to historic resources. The Curry Village Rehabilitation of Historic Cabins with Bath Structures, seismic upgrade to the Ahwahnee Dormitory, and efforts to stabilize the floor of the Ahwahnee Hotel, all consist of potential future actions with the potential to affect historic resources within the park.

### ***Overall Cumulative Impact***

Alternative 2 would involve the demolition or alteration of several historic properties (Lake High Sierra Camp Historic District, Camp Curry Historic District, Yosemite Village Historic District, and Yosemite Valley Bridges Historic District). Additionally, actions common to Alternatives 2–6 would involve the relocation or alteration of several National Register-eligible or listed structures (the NR Ahwahnee Hotel, Superintendent’s House [Residence 1], Camp Curry Historic District, and Camp 4 ). The removal of the Merced Lake High Sierra Camp Historic District, relocation of the Superintendent’s House, loss of nearly half of the contributing bridges of the Yosemite Valley Bridges Historic District, and the loss of resources in the Curry Village Area of the Yosemite Valley Historic District would potentially result in a long-term, major, adverse impact on both the individual cultural resources and

the cumulative historic fabric of the Merced River corridor. While all site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's proposed Merced River Plan programmatic agreement or standard 36 CFR Part 800 consultation, the potential effect on the character-defining features of historic resources within the Merced River corridor would result in a cumulative adverse effect on historic resources.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values across all segments under Alternative 3 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

No actions to manage visitor use and facilities across all segments under Alternative 3 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

#### **Segment 1: Merced River Above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values within Segment 1 under Alternative 3 would result in an adverse effect on historic resources. None of these actions would affect the character-defining features of a historic building, structure, or district.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-223 describes impacts of actions intended to manage visitor use and facilities in Segment 1 under Alternative 3.

Actions to manage visitor use and facilities in Segment 1 under Alternative 3 would result in a major, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District under NEPA and an adverse effect on Merced Lake High Sierra Camp Historic District under NHPA through the removal and delisting the Merced Lake High Sierra Camp Historic District from the National Register. No NHL would be affected.

**TABLE 9-223: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 1 UNDER ALTERNATIVE 3**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 1	Actions to Manage Visitor Use and Facilities	Merced Lake High Sierra Camp Historic District	The conversion of the Merced Lake High Sierra Camp to a temporary pack camp and removal of the infrastructure would adversely affect contributors to the Merced Lake High Sierra Camp Historic District.	<p>The Merced Lake High Sierra Camp is considered significant in recreation and education as one of seven high country camps whose origin dates back to the earliest days of the National Park Service. The Yosemite camp system initially began in 1916 as an effort to attract people into the park's high country. Through the use of organized parties guided by a Yosemite naturalist, the Park Service established a unique pattern of interpretive service in the high country of one of the most populous national parks, which helped acquaint the American public with the conservation objectives of the agency in all natural areas of the system (Criterion A, association with historic events) (Kirk, 2004).</p> <p><i>NEPA:</i> The alteration or removal of historic period buildings and structures in the Merced Lake High Sierra Camp area would greatly alter the Merced Lake High Sierra Camp Historic District to the point of delisting the district from the National Register. The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. The removal of contributing resources of an eligible historic district represents a substantial and highly noticeable change in character-defining features and the permanent alteration of the historic setting and character of the segment. While the action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation), the proposed action would result in a major, long term, local adverse impact on the district under NEPA and potential delisting of the district.</p> <p><i>NHPA:</i> The alteration or removal of historic period buildings and structures in the Merced Lake High Sierra Camp area would greatly alter the Merced Lake High Sierra Camp Historic District to the point of delisting the district from the National Register. The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. The removal of contributing resources of an eligible historic district represents a substantial and highly noticeable change in character-defining features and the permanent alteration of the historic setting and character of the segment. The action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in an adverse effect on Merced Lake High Sierra Camp Historic District under NHPA and potential delisting of the district.</p>

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Table 9-224 describes impacts of actions intended to protect and enhance river values in Segment 2 under Alternative 3.

**Biological Resource Actions.** Biological resource actions to protect and enhance river values in Segment 2 under Alternative 3 would result in moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA through impacts to the contributing resources of Southside Drive, Boys Town, Valley Loop Trail, and Slaughterhouse Meadow, and an adverse effect to the Yosemite Valley Historic District under NHPA. No NHL would be affected.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions to protect and enhance river values in Segment 2 under Alternative 3 would result in major, long term, local, adverse impacts on both the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA through impacts to the contributing resources of Sugar Pine Bridge, Ahwahnee Bridge, Stoneman Bridge, and an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA. No NHL would be affected.

**Cultural Resource Actions.** Cultural resource actions to protect and enhance river values in Segment 2 under Alternative 3 would result in a moderate, long term, local, beneficial impact on the Yosemite Valley and Yosemite Village Historic Districts under NEPA, and no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA through impacts resulting from the stabilization of the contributing resource of the Superintendent's House. No NHL would be affected.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-225 describes impacts of actions intended to manage visitor use and facilities in Segment 2 under Alternative 3.

**Curry Village.** Project level actions to manage visitor use and facilities in the Curry Village area would include the re design of the Curry Orchard parking area, and rerouting Southside Drive through Boys Town. Programmatic actions to manage visitor use and facilities include the reduction of the Curry Village Stables. As described in Table 9-225 below, actions to remove housing, reduce the stables, reroute Southside Drive, and alter the Curry Orchard Parking area would result in a long term, local, moderate to minor adverse effect to the Yosemite Valley Historic District under NEPA. These actions would result in an adverse effect to the Yosemite Valley Historic District through alterations to contributing historic properties under NHPA.

**Yosemite Lodge and Camp 4.** Project level actions to manage visitor use and facilities in the Yosemite Lodge and Camp 4 areas would include alterations to Yosemite Lodge, such as the redesign of parking areas, removal of existing buildings and facilities, construction of new employee housing, and repurposing of existing buildings. As described in table 9-225 below, Yosemite Lodge was identified as being a non-contributing site within the Yosemite Valley Historic District. However, it has not been evaluated for its post-WWII significance under the 50-year rule for the inventorying of historic

**TABLE 9-224: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 3**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	The restoration of Stoneman Meadow including the re-alignment of Southside Drive would affect historic circulation patterns in the Curry Village Area of the Yosemite Valley Historic District. This action would, however, improve Stoneman Meadow, another contributor to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). The historic circulation of Camp Curry is predominantly pedestrian, with vehicular approaches from the west (Old Village) and northwest (Stoneman Bridge). Today vehicular access is limited mainly to the northwestern approach, and the western approach has been converted to parking and foot trail. Since the original entry was oriented to this entrance, the historic gateway has become somewhat obsolete, at least in the current circulation configuration. Stoneman Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley, as is Southside Drive (NPS 2006d). Southside Drive is not considered a contributor to the Camp Curry Historic District (Hart, 1979).</p> <p><i>NEPA:</i> The realignment of Southside Drive through Boys Town would affect the Yosemite Valley Historic District through alteration of historic circulation patterns in Curry Village and in the Valley. The action will not, however, result in an adverse impact to the historic approach to the Curry Village area, which is the focus of remaining historic vehicular circulation. The road realignment will include a small segment of the entire length of Southside Drive, in an area not out of character with its existing route. Additionally, the restoration of Stoneman Meadow to a more historic setting would have a beneficial impact on the Yosemite Valley Historic District. Finally, the action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p>

**TABLE 9-224: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>				
Segment 2 (cont.)				<i>NHPA:</i> The realignment of Southside Drive through Boys Town would alter the Yosemite Valley Historic District through changes to historic circulation patterns. As described above, the action will not result in an adverse effect to the historic approach to the Curry Village area, but would alter Southside Drive, a contributor to the Yosemite Valley Historic District. The restoration of Stoneman Meadow to a more historic setting would improve the condition of the Yosemite Valley Historic District. These actions would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed actions would result in an adverse effect to the Yosemite Valley Historic District under NHPA.
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Rerouting the Valley Loop Trail through Slaughterhouse Meadow has the potential to affect both these contributors to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Valley Loop Trail is one of the primary trails originating in the valley. The Valley Loop Trail dates from the 1920s and was originally built as a bridle trail, generally aligned along existing circulation routes. Thirteen additional miles were added to the Valley Loop Trail in 1928, requiring the construction of 14 bridges. Today, the Valley Loop Trail includes the entire remaining bridle trail system in the valley and it is approximately 21 miles long (Criterion A). The Slaughterhouse Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p>Both the Valley Loop Trail and Slaughterhouse meadow are contributors to the National Register-listed Yosemite Valley Historic District. Rerouting the Valley Loop Trail could alter both of these resources. Any sections of Valley Loop Trail that would be rerouted would require additional analysis prior to construction or demolition. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>

**TABLE 9-224: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Bridges Historic District (1977000160); Yosemite Valley Historic District (2004001159)	Removal of Stoneman Bridge, redesign of Sentinel intersection, removal of the Ahwahnee and Sugar Pine Bridges, and restoration to natural conditions would remove contributing structures to the Yosemite Valley Bridges and Yosemite Valley Historic Districts.	<p>Bridges have been a major component of the cultural landscape of the Yosemite Valley from the first years of non-indigenous settlement. The Yosemite Valley Bridges Historic District consists of 8 granite-faced, concrete arch road bridges on the Valley floor, constructed between 1921 and 1933. The Valley bridges are unique for their architectural design and aesthetic considerations, representing an effort to build structures in the national parks which are simple and uniform in design to blend in with the environment (Criterion C) (Wilson, 1977). This bridge is also a contributor to the Yosemite Valley Historic District.</p> <p><i>NEPA:</i> The demolition and removal of Stoneman, Ahwahnee, and Sugar Pine Bridges would alter the Yosemite Valley Historic District and the Yosemite Valley Bridges Historic District. The loss of the bridges would result in the loss of nearly half of the contributing resources in the National Register-listed Yosemite Valley Bridges Historic District. This would also result in the loss of several of the major Merced River crossings within the Yosemite Valley Historic District. The action would be implemented with either the proposed Merced River Plan programmatic agreement or standard 36 CFR Part 800 consultation. The proposed actions would result in a major, long term, local, adverse impact on the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The demolition and removal of Stoneman, Ahwahnee, and Sugar Pine Bridges would result in the loss of nearly half of the contributing resources in the National Register-listed Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District. This action would be implemented with either the proposed Merced River Plan programmatic agreement or standard 36 CFR Part 800 consultation. The action will result in the loss of contributing resources to both the Yosemite Valley and Yosemite Bridges Historic Districts. The action will have an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA. This action would comply guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The removal of Stoneman Bridge would diminish the integrity of the Yosemite Valley and Yosemite Valley Bridges Historic Districts.</p>



**TABLE 9-224: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Cultural Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Rehabilitation of the Superintendent's House per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) would result in an beneficial impact to a contributor to the Yosemite Valley and Yosemite Village Historic Districts.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The rehabilitation of the building within the would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>NHPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The action will have no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>

**TABLE 9-225: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 3**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Construction of additional housing or facilities would result in an alteration to the setting of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation.</p> <p>The introduction of new permanent buildings, facilities, or additional parking has the potential to alter the setting of the Yosemite Valley Historic District. This includes actions such as increased parking at Lost Arrow and camping at Upper Pines. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p>
<b>Curry Village</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The re-design of the Curry Orchard Day Use Parking area and extension of the boardwalk through to Curry Village would result in the removal of historic trees and alteration of a contributor to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). In 1927, the Park addressed a growing problem with parking by converting a nearby apple orchard into a unique parking area for Curry Village. Curry Orchard Day Use Parking area is a contributing site to the Yosemite Valley Historic District, but not the Camp Curry Historic District (NPS 2006d; Hart, 1979).</p>

**TABLE 9-225: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p>Efforts to redesign parking within the Curry Orchard parking lot would affect historic trees in the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action would result in a long term, local, moderate adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p>Efforts to redesign parking within the Curry Orchard parking lot would alter a contributing resource to the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The rerouting of Southside Drive through Boys Town and the restoration of the remaining area would affect the historic circulation of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). The historic circulation of Camp Curry is predominantly pedestrian paths, with vehicular approaches from the west (Old Village) and northwest (Stoneman Bridge). Today vehicular access is limited mainly to the northwestern approach, and the western approach has been converted to parking and foot trail. Since the original entry was oriented to this entrance, the historic gateway has become somewhat obsolete, at least in the current circulation configuration (NPS 2006d). Southside Drive is not considered a contributor to the Camp Curry Historic District.</p>

**TABLE 9-225: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> The realignment of Southside Drive through Boys Town would affect the Yosemite Valley Historic District through alteration of historic circulation patterns in Curry Village and in the Valley. The action will not, however, result in an adverse effect to the historic approach to the Curry Village area, which is the focus of remaining historic vehicular circulation. The road realignment will include a small segment of the entire length of Southside Drive, in an area not out of character with its existing route. The proposed action does have the potential to affect historic pedestrian circulation patterns through rerouting of pedestrian paths, but this again constitutes a small portion of the total length of pedestrian paths in the Curry Village area. The action would comply with the guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The realignment of Southside Drive through Boys Town would alter the integrity of the Yosemite Valley Historic District through alteration of historic circulation patterns and alteration of a contributing resource to a historic district. As described above, the action will not result in an adverse effect to the historic approach to the Curry Village area. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in an adverse effect to the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	Reduction of the footprint of the Curry Village Stables to provide staging for temporary pack camp operation at Merced Lake High Sierra Camp and overflow parking for campgrounds, eliminating commercial day rides, would affect a contributor to the Yosemite Valley Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. In 1927, the massive stable complex known as Kenneyville was removed to make way for the Ahwahnee Hotel, and a new, smaller stable complex was built to replace it. Now located farther east near the Lamon Orchard, today Kenneyville stables (or Concessioner stables) includes a mule barn, horse stable, five associated support buildings, six employee housing units and a comfort station. With the corrals and fencing through the complex, the cluster remains with good integrity

**TABLE 9-225: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p>(NPS 2006d). The Curry Village Stables are not considered contributors to the Curry Village Historic District.</p> <p><i>NEPA:</i> The reduction of the footprint of the Curry Village Stables would affect the Yosemite Valley Historic District through the alteration of the setting of contributing resources. The reduction of size of the stables would not result in the loss of any contributing structures associated with the stables. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in a minor, long term, local adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The reduction of the footprint of the Curry Village Stables would alter the Yosemite Valley Historic District through the change of the setting of contributing resources. The reduction of size of the stables would not result in the loss of any contributing structures associated with the stables. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The action will have no adverse effect on the Yosemite Valley Historic District under NHPA.</p>
<b>Yosemite Village and Housekeeping Camp</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The relocation and formalization of the parking to the north of the road and re-routing Northside Drive south of the parking at Yosemite Village Day-Use Parking area would affect historic circulation patterns in the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Northside and Southside drives create a framework for circulation around the valley, on either side of the Merced River, and are contributing structures to the Yosemite Valley Historic District. The historic circulation of Yosemite Village is predominantly centered on Village Drive between Northside Drive and Village bike path (NPS 2006d). Northside Drive is not a contributor to the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The re-routing of Northside Drive would affect the Yosemite</p>

**TABLE 9-225: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				<p>Valley Historic District through alteration of historic circulation patterns. The road realignment will include a small segment of the entire length of Northside Drive. This action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The realignment of Northside Drive would alter the Yosemite Valley Historic District through changes to historic circulation patterns and alteration of a contributing resource to the Yosemite Valley Historic District (Northside Drive), although The road realignment will include a small segment of the entire length of Northside Drive. This action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action will alter a contributing resource to a NR historic district. The action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Relocation of the Superintendent's House to the NPS housing area and restoration of the area to natural conditions would result in an adverse effect to a contributor to the Yosemite Valley and Yosemite Village Historic Districts. This will occur in addition to the rehabilitation actions described above.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). the Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The relocation of the Superintendent's House from its historic location has the potential to alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of a building from its historic location results in the loss of historic contextual setting, and can result in the delisting of the resource from the National Register. Additionally, the introduction of the Superintendent's House to a new location has the potential to alter the setting of historic</p>

**TABLE 9-225: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				<p>resources in that location as well. The relocation of a building within the Yosemite Valley and Yosemite Village Historic Districts would result in a long term, major, local, adverse impact under NEPA.</p> <p><i>NHPA:</i> The relocation of the Superintendent's House from its isolated historic location would alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of the building would result in the loss of historical setting of the resource, resulting in the building no longer being eligible for the National Register. Additionally, the introduction of the Superintendent's House to a new location would alter the setting of historic resources in that location as well. The action will have an adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Housekeeping Camp	Removal of all lodging units at Housekeeping Camp would potentially result in the removal of a historic resource.	<p>The Housekeeping Camp area developed after 1942, and consists of closely sited, rustic cinderblock and canvas tent cabins. Service buildings include a camp store and laundry and shower facilities, all built after 1942. This area has not been evaluated for eligibility as a National Register-eligible resource.</p> <p>The removal of all lodging units at Housekeeping Camp from within the 100-year floodplain could affect historic resources. Housekeeping Camp has not been previously evaluated as a National Register-eligible resource. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. guidance to be established through development of a Programmatic Agreement for Merced River Plan or standard 36 CFR Part 800 consultation. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p>

**TABLE 9-225: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Lodge and Camp 4</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	Construction of additional housing or facilities would result in an alteration to the setting of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation.</p> <p>The introduction of new permanent buildings, facilities, or additional parking has the potential to alter the setting of the Yosemite Valley Historic District. This includes actions such as increased parking at Lost Arrow and camping at Upper Pines. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Lodge; Yosemite Valley Historic District	The removal of buildings in the Yosemite Lodge complex from the 100-year floodplain has the potential to affect historic resources in the Yosemite Lodge area.	<p>In 1956, the Yosemite Lodge was completely rebuilt and most of the old lodge buildings were demolished. The Yosemite Lodge is almost entirely the product of postwar planning and construction, but has not been evaluated for eligibility as a National Register-eligible resource (NPS 2006d).</p> <p>The removal of existing buildings in the Yosemite Lodge area could adversely affect historic resources. Yosemite Lodge has not been evaluated for NR eligibility as a Mission 66 resource. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under both NEPA and NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.</p>



properties for the National Register, and A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning. Impacts to the Yosemite Valley Historic District through the construction of new facilities within the district would result in a minor, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.

**Yosemite Village and Housekeeping Camp.** Actions in the Yosemite Village area include the relocation and formalization of the parking lot and re-routing Northside Drive at Yosemite Village Day-Use Parking area, relocation of the Superintendent’s House and ecological restoration of the area, and removal of facilities from Housekeeping Camp. As described in table 9-225 above, these actions would have a minor to moderate, local, long term adverse impact to the listed Yosemite Valley Historic District under NEPA, and an adverse effect to the Yosemite Valley Historic District under NHPA.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions intended to protect and enhance river values under Alternative 3 in Segments 3 and 4 are anticipated to result in an adverse effect on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district.

Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-226 describes impacts of actions intended to manage visitor use and facilities in Segments 3 and 4 under Alternative 3.

Actions to manage visitor use and facilities values in Segments 3 and 4 under Alternative 3 would result in negligible, long term, local adverse impacts on historic resources under NEPA in El Portal. No NHL would be affected.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions intended to manage protect and enhance river values under Alternative 3 and Segments 5, 6, 7, and 8 are anticipated to result in an adverse effect on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district. Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

**TABLE 9-226: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 3 AND 4 UNDER ALTERNATIVE 3**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 4	Actions to Manage Visitor Use and Facilities	El Portal	The construction of additional concessioner housing in the Rancheria area of El Portal has the potential to alter the historic setting of potential historic resources in El Portal.	<p>El Portal is a small community comprised of 1200 acres of land on both the north and south sides of the Merced River and Highway 140. In 1961 the National Park Service began building housing in Rancheria Flat, west of El Portal as part of the Mission 66 initiative in the National Park Service. The Rancheria Mission 66 area has been recommended as a historic district as part of a historic resource study identifying potentially eligible properties in El Portal, but has not yet received SHPO concurrence (NPS 2011r).</p> <p>The construction of new housing in the Rancheria area of El Portal has the potential to alter the historic setting of the area and any potential historic resources not currently eligible or listed by the Park. A historic resource study identifying potentially eligible properties in the vicinity of El Portal has been completed by park staff (NPS 2011r). This study provides the park with enough research/information to identify potentially eligible resources that will need further Section 110 inventory/analysis to confirm eligibility before forwarding to the SHPOs office for review and concurrence.</p>

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-227 describes impacts of actions intended to manage visitor use and facilities in Segments 5, 6, 7, and 8 under Alternative 3.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Some of the management actions proposed for Alternative 3 could have adverse effects on known historic resources through demolition, alteration, and relocation related to restoration, construction, and facilities removal. Identified historic resources that would be affected by Alternative 3 include the Merced Lake High Sierra Camp, Camp Curry Historic District, the Yosemite Valley Historic District, Camp 4, the Ahwahnee Hotel, the Yosemite Valley Bridges Historic District, the Pioneer Yosemite History Center, and the Wawona Hotel and Pavilion Historic District. Table 9-228 summarizes the impacts to these historic resources. These actions could have long-term, minor to moderate adverse effects on individual historic buildings and sites, and moderate to major adverse effects on historic districts under NEPA. The proposed demolition of the Merced Lake High Sierra Camp Historic District would result in an adverse effect under NHPA, and actions resulting in the alteration of contributing resources to the Camp Curry Village, Yosemite Bridges, or the Yosemite Valley Historic Districts would diminish the integrity of these districts and result in an adverse effect under NHPA.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

#### ***Past Actions***

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include extensive actions to preserve and maintain historic resources, including the Camp Curry Historic District (Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation), as well as restoration of meadows associated with the Yosemite Valley Historic District (Cook's Meadow). Adverse effects include the removal of the NR eligible Cascades area houses.

#### ***Present Actions***

Present actions contribute to a mixture of beneficial and adverse impacts. These impacts include efforts to restore, preserve, and protect the historic integrity and character-defining features of The Ahwahnee NHL while completing long-term rehabilitation of the building and associated features, construction of the Wawona fire station, Camp 4 relocating eight campsites, and the Ahwahnee Hotel Porte Cochère Access Walkways and Fence project. Additionally, the park has established the Curry Village Rockfall Hazard Zone, which has resulted in the loss of historic structures. These structures are being documented under a separate MOA.

**TABLE 9-227: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 5, 6, 7, AND 8 UNDER ALTERNATIVE 3**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7	Actions to Protect and Enhance River Values	Wawona Hotel and Pavilion	The removal of the tennis courts would affect potential contributors to the National Register Wawona Hotel and Pavilion District.	<p>The Wawona Hotel and Pavilion's architectural importance to American architecture is as the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity (Criterion C).</p> <p>The removal of the Wawona tennis courts would potentially affect the NR WHPHD. The Wawona tennis courts have not been previously evaluated as a National Register-eligible resource, either contributing or individually. Removal of facilities in this location would result in a potentially adverse effect. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation), without this above described analysis. A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>
Segment 7	Actions to Protect and Enhance River Values	Wawona	The closure of the stables in Wawona, along with the removal of the Wawona Golf Course, would affect contributors to the NR Wawona Hotel and Pavilion Historic District and Pioneer Yosemite History Center.	<p>The Wawona Hotel and Pavilion's architectural importance to American architecture is as the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity (Criterion C). The Wawona Golf Course, in operation since 1918 and a contributing resource as identified in the Wawona Hotel Complex Cultural Landscape Report completed in 2012. A Cultural Landscape Inventory completed for the Pioneer Yosemite History Center includes the Wawona Stables as a contributing resource.</p> <p><i>NEPA:</i> The closure of the Wawona stables and removal golf course would alter both the Pioneer Yosemite History Center and the Wawona Hotel and Pavilion Historic District. The golf course and Wawona Meadow are parts of the historic setting and landscape of the Wawona Hotel and Pavilion and contribute to its aesthetic and significance. The removal of the golf course would result in a beneficial impact through</p>

**TABLE 9-227: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 5, 6, 7, AND 8 UNDER ALTERNATIVE 3 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7 (cont.)				<p>the restoration of an earlier configuration of the historic Wawona Meadow. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground. The actions would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The proposed action would result in a long term, local, moderate adverse effect to the Wawona Hotel and Pavilion Historic District and a long term, local, minor adverse effect Pioneer Yosemite History Center under NEPA.</p> <p><i>NHPA:</i> The closure of the Wawona stables and removal golf course would alter both the Pioneer Yosemite History Center and the Wawona Hotel and Pavilion Historic District. The golf course and Wawona Meadow are parts of the historic setting and landscape of the Wawona Hotel and Pavilion and contribute to its aesthetic and significance. The removal of the golf course would result in a beneficial impact through the restoration of an earlier configuration of the historic Wawona Meadow. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground. The actions would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The action will result in the diminishment of integrity of the Wawona Hotel and Pavilion Historic District and Pioneer Yosemite History Center, and would have an adverse effect on the Wawona Hotel and Pavilion Historic District and no adverse effect on the Pioneer Yosemite History Center under NHPA. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation</p>

**TABLE 9-228: IMPACT SUMMARY TO HISTORIC RESOURCES UNDER ALTERNATIVE 3**

Historic District	Types of Impacts	Overall Impact Summary (NEPA)	Overall Impact Summary (NHPA)
Merced Lake High Sierra Camp Historic District	Removal of contributing buildings and potential delisting of the district	Long term, major, local, adverse impact	Adverse effect
NR Ahwahnee Hotel	Removal of contributing resources	long term, moderate, local, adverse impact	Adverse effect
Camp 4	construction of additional campsites, parking, and facilities	long term, minor, local, adverse impact	No adverse effect
Camp Curry Historic District	Demolition of contributing buildings.	long term, moderate, local, adverse impact	Adverse effect
Yosemite Valley Historic District	Rerouting of historic roads and trails, removal of historic buildings and facilities, construction of new buildings and facilities,	long term, moderate, local, adverse impact	Adverse effect
Yosemite Valley Bridges Historic District	Demolition of historic bridges	long term, moderate, local, adverse impact	Adverse effect
Yosemite Village Historic District	Removal of contributing resources	long term, moderate, local, adverse impact	Adverse effect
Wawona Hotel and Pavilion Historic District	Removal of potential contributing resources	long term, moderate, local, adverse impact	Adverse effect
Pioneer Yosemite History Center	Closure of operations at a contributing site	long term, minor, local, adverse impact	No adverse effect

### ***Future Actions***

Impacts from future actions would be similar to those discussed for past and present actions as a mix of beneficial and adverse impacts to historic resources. The Curry Village Rehabilitation of Historic Cabins with Bath Structures, seismic upgrade to the Ahwahnee Dormitory, and efforts to stabilize the floor of the Ahwahnee Hotel, all consist of potential future actions with the potential to affect historic resources within the park.

### ***Overall Cumulative Impact***

Alternative 3 would involve the demolition or alteration of several National Register-eligible, listed, or National Register structures (Merced Lake High Sierra Camp Historic District, Wawona Hotel and Pavilion Historic District, Yosemite Valley Historic District, and Yosemite Valley Bridges Historic District). Additionally, actions common to Alternatives 2–6 would involve the relocation or alteration of several National Register-eligible or listed structures (the NR Ahwahnee Hotel, Superintendent's House [Residence 1], Camp Curry Historic District, and Camp 4 ). The alteration or removal of these resources would potentially result in a long-term, moderate, adverse impact on both the individual resources and the cumulative historic fabric of the Merced River corridor. While all site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's proposed Merced River Plan programmatic agreement, the potential effect on the character-defining features of historic resources within the Merced River corridor would result in a long-term, moderate, adverse cumulative impact on historic resources.

## ***Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values across all river segments under Alternative 4 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

No actions to manage visitor use and facilities across all river segments under Alternative 4 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values within Segment 1 under Alternative 4 would result in an adverse effect on historic resources. None of these actions would affect the character-defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-229 describes impacts of actions intended to manage visitor use and facilities in Segment 1 under Alternative 4.

Actions to manage visitor use and facilities in Segment 1 under Alternative 4 would result in a major, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District (Merced Lake High Sierra Camp Historic District) under NEPA and an adverse effect on Merced Lake High Sierra Camp Historic District under NHPA through the potential removal and delisting the Merced Lake High Sierra Camp Historic District from the National Register. No NHL would be affected.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Table 9-230 describes impacts of actions intended to protect and enhance river values in Segment 2 under Alternative 4.

**TABLE 9-229: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 1 UNDER ALTERNATIVE 4**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 1	Actions to Manage Visitor Use and Facilities	Merced Lake High Sierra Camp Historic District	The closure of the Merced Lake High Sierra Camp conversion of the site to its natural condition would adversely affect the Merced Lake High Sierra Camp Historic District.	<p>The Merced Lake High Sierra Camp is considered significant in recreation and education as one of seven high country camps whose origin dates back to the earliest days of the National Park Service. The Yosemite camp system initially began in 1916 as an effort to attract people into the park's high country. Through the use of organized parties guided by a Yosemite naturalist, the Park Service established a unique pattern of interpretive service in the high country of one of the most populous national parks, which helped acquaint the American public with the conservation objectives of the agency in all natural areas of the system (Criterion A, association with historic events) (Kirk, 2004).</p> <p><i>NEPA:</i> The alteration or removal of historic period buildings and structures in the Merced Lake High Sierra Camp area would greatly alter the district to the point of delisting the district from the National Register consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation)local adverse impact. The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. The removal of contributing resources of an eligible historic district represents a substantial and highly noticeable change in character-defining features and the permanent alteration of the historic setting and character of the segment. While the action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation), the proposed action would result in a major, long term, local adverse impact on the district under NEPA and potential delisting of the district.</p> <p><i>NHPA:</i> The alteration or removal of historic period buildings and structures in the Merced Lake High Sierra Camp area would greatly alter the Merced Lake High Sierra Camp Historic District to the point of delisting the district from the National Register. The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. The removal of contributing resources of an eligible historic district represents a substantial and highly noticeable change in character-defining features and the permanent alteration of the historic setting and character of the segment. The action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in an adverse effect on Merced Lake High Sierra Camp Historic District under NHPA and potential delisting of the district.</p>



**TABLE 9-230: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 4**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Restoration of El Captain Meadow would result in no adverse effect to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. The El Captain Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p><i>NEPA:</i> The restoration of the meadow to its historic setting would result in a long term, local, beneficial effect to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The restoration of the meadow would improve the condition of a resource and would result in no adverse effect to the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	The restoration of Stoneman Meadow including the re-alignment of Southside Drive would affect historic circulation patterns in the Curry Village Area of the Yosemite Valley Historic District. This action would, however, improve Stoneman Meadow, another contributor to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). The historic circulation of Camp Curry is predominantly pedestrian, with vehicular approaches from the west (Old Village) and northwest (Stoneman Bridge). Today vehicular access is limited mainly to the northwestern approach, and the western approach has been converted to parking and foot trail. Since the original entry was oriented to this entrance, the historic gateway has become somewhat obsolete, at least in the current circulation configuration. Stoneman Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley, as is Southside Drive (NPS 2006d).</p> <p><i>NEPA:</i> The realignment of Southside Drive through Boys Town would affect the Yosemite Valley Historic District through alteration of historic circulation patterns in Curry Village and in the Valley. The action will not,</p>

**TABLE 9-230: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>				
Segment 2 (cont.)				<p>however, result in an adverse effect to the historic approach to the Curry Village area, which is the focus of remaining historic vehicular circulation. The road realignment will include a small segment of the entire length of Southside Drive, in an area not out of character with its existing route. Additionally, the restoration of Stoneman Meadow to a more historic setting would have a beneficial effect on the Yosemite Valley Historic District. Finally, the action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The realignment of Southside Drive through Boys Town would alter the Yosemite Valley Historic District through changes to historic circulation patterns. As described above, the action will not result in an adverse effect to the historic approach to the Curry Village area, but would alter Southside Drive, a contributor to the Yosemite Valley Historic District. The restoration of Stoneman Meadow to a more historic setting would improve the condition of the Yosemite Valley Historic District. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in an adverse effect to the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Rerouting the Valley Loop Trail through Slaughterhouse and Bridalveil Meadows has the potential to affect these contributors to the Yosemite Valley Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Valley Loop Trail is one of the primary trails originating in the valley. The Valley Loop Trail dates from the 1920s and was originally built as a bridle trail, generally aligned along existing circulation routes. Thirteen additional miles were added to the Valley Loop Trail in 1928, requiring the construction of 14 bridges. Today, the Valley Loop Trail includes the entire remaining bridle trail system in the valley and it is approximately 21 miles long (Criterion A). The Slaughterhouse Meadow

**TABLE 9-230: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>				
Segment 2 (cont.)				<p>is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p>The Valley Loop Trail, Bridalveil and Slaughterhouse meadows are contributors to the National Register-listed Yosemite Valley Historic District. Rerouting the Valley Loop Trail could alter both of these resources. Any sections of Valley Loop Trail that would be rerouted would require additional analysis prior to construction or demolition. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation), but without the above described analysis. A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>
<b>Hydrologic/Geologic Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Bridges Historic District (1977000160), Yosemite Valley Historic District (2004001159)	In order to address river flow concerns, Stoneman Bridge would be left in place, but engineer solutions, such as installation of large wood or culverts to Northside Drive, would be installed. This would result in an effect to a contributing structure to these historic districts.	<p>Bridges have been a major component of the cultural landscape of the Yosemite Valley from the first years of Non-indigenous settlement. The Yosemite Valley Bridges Historic District consists of 8 granite-faced, concrete arch road bridges on the Valley floor, constructed between 1921 and 1933. The Valley bridges are unique for their architectural design and aesthetic considerations, representing an effort to build structures in the national parks which are simple and uniform in design to blend in with the environment (Criterion C) (Wilson, 1977). This bridge is also a contributor to the Yosemite Valley Historic District.</p> <p><i>NEPA:</i> The installation of engineered solutions in the vicinity of Stoneman Bridge may alter the historic setting of a contributor to the historic Yosemite Valley Bridges Historic District and Yosemite Valley Historic District. If culverts were installed in the vicinity of Stoneman Bridge, the culverts would be installed following Yosemite Design Guidelines and mitigation measure HIST-1, and with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation) and should not affect the historic setting of the bridge, resulting in a negligible, long-term, local, adverse impact on the Yosemite Valley Bridges Historic District and Yosemite Valley Historic District under NEPA.</p>

**TABLE 9-230: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions (cont.)</b>				
Segment 2 (cont.)				<p><i>NHPA:</i> The installation of engineered solutions in the vicinity of Stoneman Bridge may alter the historic setting of a contributor to the historic Yosemite Valley Bridges Historic District and Yosemite Valley Historic District. If culverts were installed in the vicinity of Stoneman Bridge, the culverts would be installed following Yosemite Design Guidelines and mitigation measure HIST-1, and should not affect the historic setting of the bridge, resulting in no adverse effect to the Yosemite Valley Bridges Historic District or Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Bridges Historic District ((1977000160), Yosemite Valley Historic District (2004001159)	Removal of Ahwahnee and Sugar Pine Bridges and restoration to natural conditions would remove contributing structures to the Yosemite Valley Bridges and Yosemite Valley Historic Districts.	<p>Bridges have been a major component of the cultural landscape of the Yosemite Valley from the first years of Non-indigenous settlement. The Yosemite Valley Bridges Historic District consists of 8 granite-faced, concrete arch road bridges on the Valley floor, constructed between 1921 and 1933. The Valley bridges are unique for their architectural design and aesthetic considerations, representing an effort to build structures in the national parks which are simple and uniform in design to blend in with the environment (Criterion C) (Wilson, 1977). This bridge is also a contributor to the Yosemite Valley Historic District.</p> <p><i>NEPA:</i> The demolition and removal of Ahwahnee and Bridge and Sugar Pine would affect the Yosemite Valley Historic District and the Yosemite Valley Bridges Historic District. The loss of the bridges would result in the loss of nearly a third of the contributing resources in the National Register-listed Yosemite Valley Bridges. This would also result in the loss of several of the major Merced River crossings within the Yosemite Valley Historic District. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed actions would result in a major, long term, local, adverse impact on the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The demolition and removal of Ahwahnee Bridge, in combination with the removal of the Stoneman and Sugar Pine Bridges, would result in the loss of nearly a third of the contributing resources in the National Register-listed Yosemite Valley Bridges Historic District, and would affect the Yosemite Valley Historic District. This action would be taken</p>

**TABLE 9-230: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions (cont.)</b>				
Segment 2 (cont.)				consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The demolition of the bridge would result in the loss of a contributing resource to the Yosemite Valley Historic District. The action will have an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA.
<b>Cultural Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Rehabilitation of the Superintendent's House per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) would result in an beneficial impact to a contributor to the Yosemite Valley and Yosemite Village Historic Districts.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The rehabilitation of the building within the would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>NHPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The action will have no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>

**Biological Resource Actions.** Biological resource actions to protect and enhance river values in Segment 2 under Alternative 2 would result in moderate, local, long term adverse impacts on the listed Yosemite Valley Historic District under NEPA through impacts to the contributing resources of Southside Drive, Boys Town, Stoneman Meadow, Valley Loop Trail, and Slaughterhouse Meadow, and an adverse effect to the Yosemite Valley Historic District under NHPA. No NHL would be affected.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions to protect and enhance river values in Segment 2 under Alternative 2 would result in major long term, local, adverse impact on the Yosemite Valley Bridges Historic District the Yosemite Valley Historic District under NEPA through impacts to the contributing resources of Ahwahnee Bridge and Sugar Pine Bridge, and an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA. No NHL would be affected.

**Cultural Resource Actions.** Cultural resource actions to protect and enhance river values in Segment 2 under Alternative 4 would result in a moderate, long term, local, beneficial impact on the Yosemite Valley and Yosemite Village Historic Districts under NEPA, and no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA through impacts resulting from the rehabilitation of the contributing resource of the Superintendent's House. No NHL would be affected.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Table 9-231** describes impacts of actions intended to manage visitor use and facilities in Segment 2 under Alternative 4.

**Curry Village.** Project level actions to manage visitor use and facilities in the Curry Village area would include the redesign of the Curry Orchard parking area, and rerouting Southside Drive through Boys Town and construction of a 40-site campground. As described in table 9-231 below, actions to remove housing, redesign Curry Orchard Parking area, and reroute Southside Drive would result in a long term, local, moderate adverse impact to the Yosemite Valley Historic District and Camp Curry Historic District under NEPA. These actions would result in an adverse effect to the Yosemite Valley Historic District and Camp Curry Historic District through alterations to contributing historic properties under NHPA.

**Yosemite Lodge and Camp 4.** Project level actions to manage visitor use and facilities in the Yosemite Lodge and Camp 4 areas would include alterations to Yosemite Lodge, such as the redesign of parking areas, removal of existing buildings and facilities, construction of new employee housing, and repurposing of existing buildings. As described in table 9-231 below, Yosemite Lodge was identified as being a non-contributing site within the Yosemite Valley Historic District. However, it has not been evaluated for its post-WWII significance under the 50-year rule for the inventorying of historic properties for the National Register, and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning, of this action. Impacts to the Yosemite Valley Historic District through the construction of new facilities within the district would result in a minor, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.

**TABLE 9-231: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 4**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Construction of additional housing or facilities would result in an alteration to the setting of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation.</p> <p>The introduction of new permanent buildings, facilities, or additional parking has the potential to alter the setting of the Yosemite Valley Historic District. This includes actions such as increased parking at Lost Arrow and camping at Upper Pines and the former Lower River Campground. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p>
<b>Curry Village</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The re-design of the Curry Orchard Day Use Parking area and extension of the boardwalk through to Curry Village would result in the removal of historic trees and alteration of a contributor to the Yosemite Valley Historic District. Associated restoration of Stoneman Meadow would have no affect on this Yosemite Valley Historic District contributor.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). In 1927, the Park addressed a growing problem with parking by converting a nearby apple orchard into a unique parking area for Curry Village. Curry Orchard Day Use Parking area is a contributing site to the Yosemite Valley Historic District, but not the Camp Curry Historic District (NPS 2006d; Hart, 1979).</p>

**TABLE 9-231: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> Efforts to redesign parking within the Curry Orchard parking lot would affect historic trees, as well as a contributing resource to the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action would result in a long term, local, moderate adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> Efforts to redesign parking within the Curry Orchard parking lot would alter a contributing resource to the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The rerouting of Southside Drive through Boys Town, and construction of a 40-site campground is constructed would affect the historic circulation and setting of the Yosemite Valley Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). The historic circulation of Camp Curry is predominantly pedestrian pathways, with vehicular approaches from the west (Old Village) and northwest (Stoneman Bridge). Today vehicular access is limited mainly to the northwestern approach, and the western approach has been converted to parking and foot trail. Since the original entry was oriented to this entrance, the historic gateway has



**TABLE 9-231: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p>become somewhat obsolete, at least in the current circulation configuration (NPS 2006d). Southside Drive is not considered a contributor to the Camp Curry Historic District (Hart, 1979).</p> <p><i>NEPA:</i> The realignment of Southside Drive through Boys Town would affect the Yosemite Valley Historic District through alteration of historic circulation patterns in Curry Village and in the Valley. The action will not, however, result in an adverse effect to the historic approach to the Curry Village area, which is the focus of remaining historic vehicular circulation. The road realignment will include a small segment of the entire length of Southside Drive, in an area not out of character with its existing route. The action does have the potential to alter historic pedestrian circulation through the rerouting of pedestrian paths. The conversion of Boys Town to a campground would also result in the removal of historic tent cabins and structures, altering both the Yosemite Valley and Camp Curry Historic Districts. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or 36 CFR Part 800 consultation). The proposed action will have a major, local, long term impact effect on the listed Yosemite Valley and Camp Curry Historic Districts under NEPA.</p> <p><i>NHPA:</i> The realignment of Southside Drive through Boys Town would affect the Yosemite Valley Historic District through alteration of historic circulation patterns through impacts to contributing Southside Drive. As described above, however, the action will not result in an adverse effect to the historic approach to the Curry Village area. Additionally, the conversion of Boys Town to a campground would diminish the integrity of both the Yosemite Valley and Camp Curry Historic Districts. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan, or standard 36 CFR Part 800 consultation. This action will result in the alteration of a contributing resource to a NR historic district, and will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>

**TABLE 9-231: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The relocation and formalization of the parking to the north of the road and re-routing Northside Drive south of the parking at Yosemite Village Day-Use Parking area would affect historic circulation patterns in the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Northside and Southside drives create a framework for circulation around the valley, on either side of the Merced River, and are contributing structures to the Yosemite Valley Historic District. The historic circulation of Yosemite Village is predominantly centered on Village Drive between Northside Drive and Village bike path (NPS 2006d). Northside Drive is not a contributor to the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The re-routing of Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns as well as alteration of a contributing resource (Northside Drive). The road realignment will include a small segment of the entire length of Northside Drive. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The realignment of Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns. The road realignment will include a small segment of the entire length of Northside Drive. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The alteration of a contributing resource would have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>

**TABLE 9-231: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Relocation of the Superintendent's House and garage to the NPS housing area and restoration of the area to natural conditions would result in an adverse effect to a contributor to the Yosemite Valley and Yosemite Village Historic Districts. This will occur in addition to the rehabilitation actions described above.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House and garage are contributors to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The relocation of the Superintendent's House and garage from its historic location has the potential to alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of a building from its historic location results in the loss of historic contextual setting, and can result in the delisting of the resource from the National Register. Additionally, the introduction of the Superintendent's House and garage to a new location has the potential to alter the setting of historic resources in that location as well. The relocation of a building within the Yosemite Valley and Yosemite Village Historic Districts would result in a long term, moderate, local, adverse impact.</p> <p><i>NHPA:</i> The relocation of the Superintendent's House and garage from its isolated historic location would alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of the building would result in the loss of historical setting of the resource, resulting in the building no longer being eligible for the National Register. Additionally, the introduction of the Superintendent's House and garage to a new location would alter the setting of historic resources in that location as well. The action will have an adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Housekeeping Camp	Removal of 166 lodging units from the ordinary high water mark at Housekeeping Camp would potentially affect a historic resource.	The Housekeeping Camp area developed after 1942, and consists of closely sited, rustic cinderblock and canvas tent cabins. Service buildings include a camp store and laundry and shower facilities, all built after 1942. This area has not been evaluated for eligibility as a National Register-eligible resource.

**TABLE 9-231: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 4 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				The removal of 166 lodging units (83 duplex lodging units, 4 restrooms, store and office) and other facilities out of the observed ordinary high water mark could affect historic resources. Housekeeping Camp has not been previously evaluated as a National Register-eligible resource. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement, and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO.
<b>Yosemite Lodge and Camp 4</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Lodge; Yosemite Valley Historic District	Construction of new employee housing or parking in the vicinity of Yosemite Lodge or the removal of existing buildings within the flood plain would potentially result in the removal of a historic resource.	<p>In 1956, the Yosemite Lodge was completely rebuilt and most of the old lodge buildings were demolished. The Yosemite Lodge is almost entirely the product of postwar planning and construction, but has not been evaluated for eligibility as a National Register-eligible resource (NPS 2006d).</p> <p>The construction of additional employee housing or parking in the vicinity of Yosemite Lodge or removal of existing buildings could affect historic resources, including the Yosemite Valley Historic District. Yosemite Lodge has not been previously evaluated as a National Register-eligible resource. Addition of new facilities or removal of existing buildings in this location potentially would alter the Yosemite Valley Historic District. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. While this action would be completed in compliance guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation, without this above described analysis, it is not possible to determine the impact of this action under NEPA/NHPA.</p>

**Yosemite Village and Housekeeping Camp.** Actions in the Yosemite Village area include the relocation and formalization of the parking lot and re-routing Northside Drive at Yosemite Village Day-Use Parking area, relocation of the Superintendent’s Residence and ecological restoration of the area, and removal of facilities from Housekeeping Camp. As described in table 9-231 above, these actions would have a moderate, local, long term adverse impact to the listed Yosemite Valley Historic District under NEPA, and an adverse effect to the Yosemite Valley Historic District under NHPA.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, actions intended to protect and enhance river values in Segments 3 and 4 would not be likely to result in adverse effects on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district. Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-232 describes impacts of actions intended to manage visitor use and facilities in Segments 3 and 4 under Alternative 4.

Actions to manage visitor use and facilities values in Segments 3 and 4 under Alternative 4 would result in negligible, long term, local adverse impacts on historic resources under NEPA in El Portal. No NHL would be affected.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, actions intended to protect and enhance river values in Segments 5, 6, 7, and 8 would not be likely result in an adverse effect on historic resources, as they would not involve actions that would impact the character defining features of a historic building, structure, or district. Impacts common to all alternatives are discussed above.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-233 describes impacts of actions intended to manage visitor use and facilities in Segments 5, 6, 7, and 8 under Alternative 4.

**TABLE 9-232: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 3 AND 4 UNDER ALTERNATIVE 4**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 4	Actions to Manage Visitor Use and Facilities	El Portal	The construction of additional concessioner housing in the Rancheria area of El Portal has the potential to alter the historic setting of potential historic resources in El Portal.	<p>El Portal is a small community comprised of 1200 acres of land on both the north and south sides of the Merced River and Highway 140. In 1961 the National Park Service began building housing in Rancheria Flat, west of El Portal as part of the Mission 66 initiative in the National Park Service. The Rancheria Mission 66 area has been recommended as a historic district as part of a historic resource study identifying potentially eligible properties in El Portal, but has not yet received SHPO concurrence (NPS 2011r).</p> <p>The construction of new housing in the Rancheria area of El Portal has the potential to alter the historic setting of the area and any potential historic resources not currently eligible or listed by the Park. A historic resource study identifying potentially eligible properties in the vicinity of El Portal has been completed by park staff (NPS 2011r). This study provides the park with enough research/information to identify potentially eligible resources that will need further Section 110 inventory/analysis to confirm eligibility before forwarding to the SHPOs office for review and concurrence.</p>

**TABLE 9-233: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 5, 6, 7 AND 8 UNDER ALTERNATIVE 4**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7	Actions to Manage Visitor Use and Facilities	Pioneer Yosemite History Center	The closure of the stables in Wawona would affect contributors to the Pioneer Yosemite History Center.	<p>The Wawona Hotel and Pavilion's architectural importance to American architecture is as the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity (Criterion C). A Cultural Landscape Inventory completed for the Pioneer Yosemite History Center includes the Wawona Stables as a contributing resource.</p> <p><i>NEPA:</i> The closure of the Wawona stables would alter the Pioneer Yosemite History Center. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The proposed action would result in a long term, local, minor adverse effect Pioneer Yosemite History Center under NEPA.</p> <p><i>NHPA:</i> The closure of the Wawona stables would alter the Pioneer Yosemite History Center. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The action would have no adverse effect on the Pioneer Yosemite History Center under NHPA. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation/NHPA</p>

### Summary of Impacts from Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration

Alternative 4 would result in fewer adverse effects on historic resources than under Alternatives 2 and 3; however, some of the management actions proposed with Alternative 4 could adversely affect known historic resources through demolition, alteration, and relocation related to restoration, construction, and facilities removal. Identified historic resources that would be affected by Alternative 4 include the Merced Lake High Sierra Camp, Camp Curry Historic District, NR Ahwahnee Hotel, Camp 4, Yosemite Valley Historic District, and the Yosemite Valley Bridges Historic District. Table 9-234 summarizes the impacts to these historic resources. These impacts would include altering the character-defining features or historic context, or potentially demolishing National Register-listed resources or eligible resources. These actions could cause long-term, moderate, local, adverse impacts on historic buildings and sites, and minor to moderate adverse impacts on historic districts.

**TABLE 9-234: IMPACT SUMMARY TO HISTORIC RESOURCES UNDER ALTERNATIVE 4**

Historic District	Types of Impacts	Overall Impact Summary (NEPA)	Overall Impact Summary (NHPA)
Merced Lake High Sierra Camp Historic District	Alteration or removal of contributing buildings	Long term, moderate, local, adverse impact	Adverse effect
Camp Curry Historic District	Demolition of contributing buildings.	long term, minor, local, adverse impact	No adverse effect
Yosemite Valley Historic District	Rerouting of historic roads and trails, removal of historic buildings and facilities, construction of new buildings and facilities,	long term, moderate, local, adverse impact	Adverse effect
NR Ahwahnee Hotel	Removal of contributing resources	long term, moderate, local, adverse impact	
Camp 4	construction of additional campsites, parking, and facilities	long term, minor, local, adverse impact	No adverse effect
Yosemite Village Historic District	Rerouting of historic roads	long term, minor to moderate, local, adverse impact	Adverse effect
Yosemite Valley Bridges Historic District	Demolition of historic bridges	long term, major, local, adverse impact	Adverse effect
Yosemite Pioneer History Center	Closure of operations at a contributing site	long term, minor, local, adverse impact	No adverse effect
Wawona Hotel and Pavilion District.	Removal of contributing resource	long term, moderate, local, adverse impact	Adverse effect



## **Cumulative Impacts from Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration**

### ***Past Actions***

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include extensive actions to preserve and maintain historic resources, including the Camp Curry Historic District (Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation), as well as restoration of meadows associated with the Yosemite Valley Historic District (Cook's Meadow). Adverse effects include the removal of the NR eligible Cascades area houses.

### ***Present Actions***

Present actions contribute to a mixture of beneficial and adverse impacts. These impacts include efforts to restore, preserve, and protect the historic integrity and character-defining features of The Ahwahnee NHL while completing long-term rehabilitation of the building and associated features, construction of the Wawona fire station, Camp 4 relocating eight campsites, and the Ahwahnee Hotel Porte Cochère Access Walkways and Fence project. Additionally, the park has established the Curry Village Rockfall Hazard Zone, which has resulted in the loss of historic structures. These structures are being documented under a separate MOA.

### ***Future Actions***

Impacts from future actions would be similar to those discussed for past and present actions as a mix of beneficial and adverse impacts to historic resources. The Curry Village Rehabilitation of Historic Cabins with Bath Structures, seismic upgrade to the Ahwahnee Dormitory, and efforts to stabilize the floor of the Ahwahnee Hotel, all consist of potential future actions with the potential to affect historic resources within the park.

### ***Overall Cumulative Impact***

Alternative 4 would involve the demolition or alteration of several National Register-eligible or -listed structures and historic districts (Merced Lake High Sierra Camp Historic District, Yosemite Valley Historic District, and Yosemite Valley Bridges Historic District). Additionally, actions common to Alternatives 2–6 would involve the relocation or alteration of several National Register-eligible, listed, or National Historic Landmark structures (the NR Ahwahnee Hotel, Superintendent's House [Residence 1], Camp Curry Historic District, and Camp 4). The alteration or removal of these resources would potentially result in a long-term, moderate, adverse impact on both the individual cultural resources and the cumulative historic fabric of the Merced River corridor. While all site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's proposed Merced River Plan programmatic agreement, the potential effect on the character-defining features of historic resources within the river corridor would result in a long-term, moderate adverse cumulative effect on historic resources.

## ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values across all river segments under Alternative 5 would result in an adverse effect on historic resources. None of the Alternative 5 proposed actions would affect the character-defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

No actions to manage visitor use and facilities across all river segments under Alternative 5 would adversely affect historic resources. None of the proposed actions would affect the character defining features of a historic building, structure, or district.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, actions intended to protect and enhance river values in Segment 1 would not be likely to result in adverse effects on historic resources. None of these actions would affect the character-defining features of a historic building, structure, or district.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-235 describes impacts of actions intended to manage visitor use and facilities in Segment 1 under Alternative 5.

Actions to manage visitor use and facilities in Segment 1 under Alternative 5 would result in a negligible, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District (Merced Lake High Sierra Camp Historic District) under NEPA and no adverse effect on Merced Lake High Sierra Camp Historic District under NHPA. No NHL would be affected.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Table 9-236 describes impacts of actions intended to protect and enhance river values in Segment 2 under Alternative 5.

**TABLE 9-235: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 1 UNDER ALTERNATIVE 5**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 1	Actions to Manage Visitor Use and Facilities	Merced Lake High Sierra Camp Historic District	The reduction of the number of beds at the Merced Lake High Sierra Camp to 11 units (of an original 22) would not adversely affect the Merced Lake High Sierra Camp Historic District.	<p>The Merced Lake High Sierra Camp is considered significant in recreation and education as one of seven high country camps whose origin dates back to the earliest days of the National Park Service. The Yosemite camp system initially began in 1916 as an effort to attract people into the park's high country. Through the use of organized parties guided by a Yosemite naturalist, the Park Service established a unique pattern of interpretive service in the high country of one of the most populous national parks, which helped acquaint the American public with the conservation objectives of the agency in all natural areas of the system (Criterion A) (Kirk, 2004).</p> <p><i>NEPA:</i> The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. All 22 canvas and frame tents are considered contributors to the Merced Lake High Sierra Camp Historic District. No historic buildings would be removed under this alternative, although the number of overnight users would be reduced. The reduction of beds within the district would not result in the diminishment of the integrity of the Merced Lake High Sierra Camp Historic District. The action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in a long term, negligible, local adverse impact on the district under NEPA.</p> <p><i>NHPA:</i> The Merced Lake High Sierra Camp Historic District is one of the few National Register-eligible resources in Segment 1. All 22 canvas and frame tents are considered contributors to the Merced Lake High Sierra Camp Historic District. No historic buildings would be removed under this alternative, although the number of overnight users would be reduced. The reduction of beds within the district would not result in the diminishment of the integrity of the Merced Lake High Sierra Camp Historic District. The action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The action will have no adverse effect on the Merced Lake High Sierra Camp Historic District under NHPA.</p>

**TABLE 9-236: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 5**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Restoration of El Captain Meadow would result in no adverse effect to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. The El Captain Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p><i>NEPA:</i> The restoration of the meadow to its historic setting would result in a long term, local, beneficial effect to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The restoration of the meadow would improve the condition of a resource and would result in no adverse effect to the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Rerouting the Valley Loop Trail, including the construction of boardwalks through sensitive habitat in Slaughterhouse Meadow, has the potential to affect both these contributors to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Valley Loop Trail is one of the primary trails originating in the valley. The Valley Loop Trail dates from the 1920s and was originally built as a bridle trail, generally aligned along existing circulation routes. Thirteen additional miles were added to the Valley Loop Trail in 1928, requiring the construction of 14 bridges. Today, the Valley Loop Trail includes the entire remaining bridle trail system in the valley and it is approximately 21 miles long (Criterion A). The Slaughterhouse Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p>Both the Valley Loop Trail and Slaughterhouse meadow are contributors to the National Register-listed Yosemite Valley Historic District. Rerouting the Valley Loop Trail could alter these historic resources. Any sections of Valley Loop Trail that would be rerouted would require additional analysis prior to construction or demolition. The action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>

**TABLE 9-236: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Bridges Historic District (1977000160); Yosemite Valley Historic District (2004001159)	In order to address river flow concerns, Stoneman Bridge would be left in place, but engineer solutions, such as installation of large wood or culverts to Northside Drive, would be installed. This would result in an effect to a contributing structure to this historic district.	<p>Bridges have been a major component of the cultural landscape of the Yosemite Valley from the first years of Non-indigenous settlement. The Yosemite Valley Bridges Historic District consists of 8 granite-faced, concrete arch road bridges on the Valley floor, constructed between 1921 and 1933. The Valley bridges are unique for their architectural design and aesthetic considerations, representing an effort to build structures in the national parks which are simple and uniform in design to blend in with the environment (Criterion C) (Wilson, 1977). This bridge is also a contributor to the Yosemite Valley Historic District.</p> <p><i>NEPA:</i> The installation of engineered solutions in the vicinity of Stoneman Bridge may alter the historic setting of a contributor to the historic Yosemite Valley Bridges Historic District and Yosemite Valley Historic District. If culverts were installed in the vicinity of Stoneman Bridge, the culverts would be installed following Yosemite Design Guidelines and mitigation measure HIST-1, and guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation) and should not affect the historic setting of the bridge, resulting in a negligible, local, long- term, local, adverse impact on the Yosemite Valley Bridges Historic District and Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The installation of engineered solutions in the vicinity of Stoneman Bridge may alter the historic setting of a contributor to the historic Yosemite Valley Bridges Historic District and Yosemite Valley Historic District. If culverts were installed in the vicinity of Stoneman Bridge, the culverts would be installed following Yosemite Design Guidelines and mitigation measure HIST-1, and should not affect the historic setting of the bridge, resulting in no adverse effect to the Yosemite Valley Bridges Historic District or Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Bridges Historic District (1977000160); Yosemite Valley Historic District (2004001159)	Removal of Sugar Pine Bridge and restoration to natural conditions would remove a contributing structure to the Yosemite Valley Bridges and Yosemite Valley Historic Districts.	Bridges have been a major component of the cultural landscape of the Yosemite Valley from the first years of Non-indigenous settlement. The Yosemite Valley Bridges Historic District consists of 8 granite-faced, concrete arch road bridges on the Valley floor, constructed between 1921 and 1933. The Valley bridges are unique for their architectural design and aesthetic considerations, representing an effort to build structures in the national parks which are simple and uniform in design to blend in with

**TABLE 9-236: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions (continued)</b>				
Segment 2 (cont.)				<p>the environment (Criterion C) (Wilson, 1977). This bridge is also a contributor to the Yosemite Valley Historic District.</p> <p><i>NEPA:</i> The demolition and removal of Sugar Pine Bridge would affect the Yosemite Valley Historic District and the Yosemite Valley Bridges Historic District. The loss of the bridge would result in the loss of contributing resources in the National Register-listed Yosemite Valley Historic District and the Yosemite Valley Bridges Historic District. This would also result in the loss of a major Merced River crossing within the Yosemite Valley Historic District. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed actions would result in a major, long term, local, adverse impact on the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The demolition and removal of Sugar Pine Bridge would result in the loss of contributing resources to the National Register-listed Yosemite Valley Historic District and the Yosemite Valley Bridges Historic District. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The demolition of the bridge would result in the loss of a contributing resource to the Yosemite Valley Historic District. The action will have an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA.</p>
<b>Cultural Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Rehabilitation of the Superintendent's House per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) would result in an beneficial impact to a contributor to the Yosemite Valley and Yosemite Village Historic Districts.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the</p>

**TABLE 9-236: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Cultural Resource Actions (cont.)</b>				
Segment 2 (cont.)				<p>Interior's Standards for the Treatment of Historic Properties. The rehabilitation of the building within the would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>NHPA:</i> The rehabilitation of the Superintendent's House would be undertaken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The action will have no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>

**Biological Resource Actions.** Biological resource actions to protect and enhance river values in Segment 2 under Alternative 5 would result in moderate, long term, local, beneficial impact on the Yosemite Valley Historic District under NEPA. Through actions to restore contributing meadows, but impacts to the contributing resource of Valley Loop Trail would require additional analysis prior to determination of effect. Restoration of the meadows would result in no adverse effect on the Yosemite Valley Historic District under NHPA. No NHL would be affected.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions to protect and enhance river values in Segment 2 under Alternative 5 would result in major, long term, local, adverse impact on the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA through removal of the contributing resource of Sugar Pine Bridge, and an adverse effect on the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District under NHPA. No NHL would be affected.

**Cultural Resource Actions.** Cultural resource actions to protect and enhance river values in Segment 2 under Alternative 5 would result in a moderate, long term, local, beneficial impact on the Yosemite Valley and Yosemite Village Historic Districts under NEPA, and no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA through impacts resulting from the rehabilitation of the contributing resource of the Superintendent's House. No NHL would be affected.

#### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Table 9-237 describes impacts of actions intended to manage visitor use and facilities in Segment 2 under Alternative 5.

**Curry Village.** Project level actions to manage visitor use and facilities in the Curry Village area would include the replacement of 90 tent cabins and 14 cabins without baths in Boys Town with 98 new hard-sided units, and redesign of the Curry Orchard Day Use Parking area. As described in table 9-237 actions to remove housing, alter parking, redesign of Curry Orchard Parking area, and reroute Southside Drive would result in a long term, local, major adverse impact to the Yosemite Valley Historic District under NEPA. These actions would result in an adverse effect to the Yosemite Valley Historic District through alterations to contributing historic properties under NHPA.

**Yosemite Lodge and Camp 4.** Project level actions to manage visitor use and facilities in the Yosemite Lodge and Camp 4 areas would include alterations to Yosemite Lodge, such as the redesign of parking areas, removal of existing buildings and facilities, construction of new employee housing, and repurposing of existing buildings. As described in table 9-237, Yosemite Lodge was identified as being a non-contributing site within the Yosemite Valley Historic District. However, it has not been evaluated for its post-WWII significance under the 50-year rule for the inventorying of historic properties for the National Register, and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning. Impacts to the Yosemite Valley Historic District through the construction of new facilities within the district would result in a minor, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.



**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Construction of additional housing or facilities would result in an alteration to the setting of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation.</p> <p>NEPA: The introduction of new permanent buildings, facilities, or additional parking has the potential to alter the setting of the Yosemite Valley Historic District. This includes actions such as increased parking at Lost Arrow and West Valley Overflow, and camping at Upper Pines Campground. The Park will complete NHPA section 110 prior to this action. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of impact under NEPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p> <p>NHPA: The introduction of new permanent buildings, facilities, or additional parking has the potential to alter the setting of the Yosemite Valley Historic District. This includes actions such as increased parking at Lost Arrow and West Valley Overflow, and camping at Upper Pines Campground. The Park will complete NHPA section 110 prior to this action. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of effect under NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p>

**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The formalization of the Curry Orchard Day Use Parking area would result in removal of the historic curry apple orchard, a contributing site in the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). In 1927, the Park addressed a growing problem with parking by converting a nearby apple orchard into a unique parking area for Curry Village. Curry Orchard Day Use Parking area is a contributing site to the Yosemite Valley Historic District, but not the Camp Curry Historic District (NPS 2006d; Hart, 1979).</p> <p><i>NEPA:</i> Efforts to formalize parking within the Curry Orchard parking lot would affect a contributing site to the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action would result in a long term, local, moderate adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> Efforts to formalize parking within the Curry Orchard parking lot would alter a contributing resource to the Yosemite Valley Historic District. All trees will be removed from the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>

**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The replacement of 90 tent cabins and 14 cabins without baths in Boys Town with 98 new hard-sided units (duplex/fourplex) would remove all 73 contributing historic canvas tent cabins (5 to be relocated), 14 (of 16) contributing historic bungalows.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). While contributors to the Yosemite Valley Historic District, the 16 Boys Town employee tents (and 73 Camp Curry Employee Canvas Cabins) on the north side of the road does not create an important space in the overall organization of the Camp Curry developed area, although it does possess its own, distinctive character (NPS 2006d).</p> <p><i>NEPA:</i> The removal of tent cabins and cabins from Boys Town would affect the Yosemite Valley Historic District. The loss of these buildings would alter the historic setting of Yosemite Valley Historic District. The loss of the cabins would result in the loss of 14 of 302 contributing buildings to the Yosemite Valley Historic District, and 73 of the over 600 contributing structures (of 902 total contributing resources). Mitigation will be consistent with that proposed in the Curry Village Rockfall Hazard MOA, including updating the National Register Nomination forms for both the Yosemite Valley Historic District and the Camp Curry Historic District to reflect changes to the districts, landscape and architectural documentation of Curry Village, salvage of materials where ever possible, and the preparation of interpretive materials. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in a long term, local, major adverse impact to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The removal of tent cabins and cabins from Boys Town would affect the Yosemite Valley Historic District. The loss of the cabins would result in the loss of 14 of 302 contributing buildings to the Yosemite Valley Historic District, and 73 of the over 600 contributing structures (of 902 total contributing resources). This action would be taken consistent with guidance</p>

**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				to be established through development of a programmatic agreement for the Merced River Plan as well as the Historic Preservation Treatment Procedures outlined in Appendix J. Mitigation will be consistent with that proposed in the Curry Village Rockfall Hazard MOA, including updating the National Register Nomination forms for both the Yosemite Valley Historic District and the Camp Curry Historic District to reflect changes to the districts, landscape and architectural documentation of Curry Village, salvage of materials where ever possible, and the preparation of interpretive materials. This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.
<b>Yosemite Village and Housekeeping Camp</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The relocation and formalization of the parking to the north of the road and re-routing Northside Drive south of the parking at Yosemite Village Day-Use Parking area would affect historic circulation patterns in the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Northside and Southside drives create a framework for circulation around the valley, on either side of the Merced River, and are contributing structures to the Yosemite Valley Historic District. The historic circulation of Yosemite Village is predominantly centered on Village Drive between Northside Drive and Village bike path (NPS 2006d). Northside Drive is not a contributor to the Yosemite Village Historic District (Wilson, 1977).</p> <p><i>NEPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The re-routing of Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns as well as alteration of a contributing resource (Northside Drive). The road realignment will include a small segment of the entire length of Northside Drive. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner</p>

**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				Garage. The realignment of Northside Drive would alter the Yosemite Valley Historic District through alteration of historic circulation patterns. The road realignment will include a small segment of the entire length of Northside Drive. This action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The alteration of a contributing resource would have an adverse effect on the Yosemite Valley Historic District under NHPA.
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	The construction of a traffic circle at Northside Drive and Village Drive at Yosemite Village Day-Use Parking area, would affect historic circulation patterns.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). Circulation within Yosemite Valley consists of a variety of vehicular, pedestrian, and equestrian routes (NPS 2006d). The historic circulation of Yosemite Village is predominantly centered on Village Drive between Northside Drive and Village bike path (NPS 2006d). Northside Drive is not a contributor to the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The construction of the traffic circle at Northside Drive would affect the Yosemite Valley Historic District and Yosemite Village Historic District through alteration of historic circulation patterns. The road realignment will include a small segments of the entire lengths of Northside and Village Drives. Both of these would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District and Yosemite Village Historic District under NEPA.</p> <p><i>NHPA:</i> The construction of the traffic circle at Northside Drive would affect the Yosemite Valley Historic District and Yosemite Village Historic District through alteration of historic circulation patterns. The road realignment will include a small segments of the entire lengths of Northside and Village Drives. This action would be taken consistent with guidance to be</p>

**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The alteration of contributing resources would have an adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Relocation of the Superintendent's House and garage to the NPS housing area and restoration of the area to natural conditions would result in an adverse effect to a contributor to the Yosemite Valley and Yosemite Village Historic Districts. This will occur in addition to the rehabilitation actions described above.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House and garage are contributors to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The relocation of the Superintendent's House and garage from its historic location has the potential to alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of a building from its historic location results in the loss of historic contextual setting, and can result in the delisting of the resource from the National Register. Additionally, the introduction of the Superintendent's House and garage to a new location has the potential to alter the setting of historic resources in that location as well. The relocation of buildings within the Yosemite Valley and Yosemite Village Historic Districts would result in a long term, major, local, adverse impact.</p> <p><i>NHPA:</i> The relocation of the Superintendent's House and garage from its isolated historic location would alter the Yosemite Valley and Yosemite Village Historic Districts. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The relocation of the buildings would result in the loss of historical setting of the resource, resulting in the building no longer being eligible for the National Register. Additionally, the introduction of the Superintendent's House and garage to a new location would alter the setting of historic resources in that location as well. The action will have an adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>

**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District	Removal of buildings from Housekeeping Camp would potentially result in the removal of a historic resource.	<p>The Housekeeping Camp area developed after 1942, and consists of closely sited, rustic cinderblock and canvas tent cabins. Service buildings include a camp store and laundry and shower facilities, all built after 1942. With the exception of the Housekeeping Pedestrian Bridge, Housekeeping Camp was identified as being a non-contributing site within the Yosemite Valley Historic District. However, it has not been evaluated for its post-WWII significance under the 50-year rule for the inventorying of historic properties for the National Register.</p> <p>NEPA: The removal of 34 lodging units and other facilities out of the observed ordinary high water mark could affect historic resources. Housekeeping Camp has not been previously evaluated as a National Register-eligible resource. The Park will complete Section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. Removal of the facilities in these locations would potentially result in an adverse impact. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of impact under NEPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.</p> <p>NHPA: The removal of 34 lodging units and other facilities out of the observed ordinary high water mark could alter historic resources. Housekeeping Camp has not been previously evaluated as a National Register-eligible resource. The Park will complete Section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid,</p>

**TABLE 9-237: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 5 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				minimize or mitigate any potentially adverse effect to the historic property. This action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. Removal of the facilities in these locations would potentially result in an adverse effect. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.
<b>Yosemite Lodge and Camp 4</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District	Construction of new employee housing or parking in the vicinity of Yosemite Lodge or the removal of existing buildings within the floodplain would potentially result in the removal of a historic resource.	<p>In 1956, the Yosemite Lodge was completely rebuilt and most of the old lodge buildings were demolished. The Yosemite Lodge is almost entirely the product of postwar planning and construction (NPS 2006d).</p> <p>NEPA: The construction of additional employee housing or parking in the vicinity of Yosemite Lodge or removal of existing buildings could impact historic resources. Yosemite Lodge has not been evaluated for NR eligibility as a Mission 66 resource. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of impact under NEPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.</p> <p>NHPA: The construction of additional employee housing or parking in the vicinity of Yosemite Lodge or removal of existing buildings could affect historic resources. Yosemite Lodge has not been evaluated for NR eligibility as a Mission 66 resource. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.</p>



**Yosemite Village and Housekeeping Camp.** Actions in the Yosemite Village area include the relocation and formalization of the parking lot and re-routing Northside Drive at Yosemite Village Day-Use Parking area, relocation of the Superintendent’s House and ecological restoration of the area, construction of a roundabouts and a pedestrian underpass at Yosemite Village Day-Use Parking area, and removal of facilities from Housekeeping Camp. As described in Table 9-237, these actions would have a moderate, local, long term adverse impact to the listed Yosemite Valley Historic District under NEPA, and an adverse effect to the Yosemite Valley Historic District under NHPA.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, actions intended to protect and enhance river values in Segments 3 and 4 would not be likely to result in adverse effects on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district. Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Table 9-238 describes impacts of actions intended to manage visitor use and facilities in Segments 3 and 4 under Alternative 5.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, actions intended to protect and enhance river values in Segments 5, 6, 7, and 8 would not be likely to result in adverse effects on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district. Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 5, actions intended to manage visitor use and facilities in Segments 5, 6, 7, and 8 would not be likely to result in adverse effects on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district. Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

**TABLE 9-238: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 3 AND 4 UNDER ALTERNATIVE 5**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 4	Actions to Manage Visitor Use and Facilities	El Portal Historic Structures	The construction of additional concessioner housing in the Rancheria area of El Portal has the potential to alter the historic setting of potential historic resources in El Portal.	<p>El Portal is a small community comprised of 1200 acres of land on both the north and south sides of the Merced River and Highway 140. In 1961 the National Park Service began building housing in Rancheria Flat, west of El Portal as part of the Mission 66 initiative in the National Park Service. A draft historic resource study for El Portal has identified the Rancheria Mission 66 complex as being potentially eligible for listing in the National Register. A Section 110 inventory would need to be completed prior to site planning (NPS 2011r).</p> <p>The construction of new housing in the Rancheria area of El Portal has the potential to alter the historic setting of the area and any potential historic resources not currently eligible or listed by the Park. A historic resource study identifying potentially eligible properties in the vicinity of El Portal has been completed by park staff (NPS 2011r). This study provides the park with enough research/information to identify potentially eligible resources that will need further Section 110 inventory/analysis to confirm eligibility before forwarding to the SHPOs office for review and concurrence.</p>

## Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration

Alternative 5 would result in fewer adverse effects on historic resources than Alternatives 2, 3, or 4; however, some of the management actions proposed for Alternative 5 could have adverse effects on known historic resources through demolition, alteration, and relocation related to restoration, construction, and facilities removal. Identified historic resources that would be affected by Alternative 5 include the Camp Curry Historic District, the Yosemite Valley Historic District, Yosemite Village Historic District, and the Yosemite Valley Bridges Historic District. **Table 9-239** summarizes the impacts to these historic resources. These impacts would include the alteration of character-defining features or historic context, or potential demolition of National Register-listed resources or eligible resources.

**TABLE 9-239: IMPACT SUMMARY TO HISTORIC RESOURCES UNDER ALTERNATIVE 5**

Historic District	Types of Impacts	Overall Impact Summary (NEPA)	Overall Impact Summary (NHPA)
Merced Lake High Sierra Camp Historic District	Removal of contributing resources	long term, negligible, local, adverse impact	No adverse effect
Camp Curry Historic District	Demolition of contributing resources	long term, moderate, local, adverse impact	Adverse effect
Yosemite Valley Historic District	Rerouting of historic roads and trails, removal of historic buildings and facilities, construction of new buildings and facilities	long term, moderate, local, adverse impact	Adverse effect
NR Ahwahnee Hotel	Removal of contributing resources	long term, moderate, local, adverse impact	Adverse effect
Camp 4	construction of additional campsites, parking, and facilities	long term, minor, local, adverse impact	No adverse effect
Yosemite Village Historic District	Removal of contributing roads and buildings	long term, moderate, local, adverse impact	Adverse effect
Yosemite Valley Bridges Historic District	Alteration of the setting of historic bridges, removal of historic bridge	long term, moderate, local, adverse impact	Adverse effect

## Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration

### *Past Actions*

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include extensive actions to preserve and maintain historic resources, including the Camp Curry Historic District (Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation), as well as restoration of meadows associated with the Yosemite Valley Historic District (Cook's Meadow). Adverse effects include the removal of the NR eligible Cascades area houses.

***Present Actions***

Present actions contribute to a mixture of beneficial and adverse impacts. These impacts include efforts to restore, preserve, and protect the historic integrity and character-defining features of The Ahwahnee NHL while completing long-term rehabilitation of the building and associated features, construction of the Wawona fire station, Camp 4 relocating eight campsites, and the Ahwahnee Hotel Porte Cochère Access Walkways and Fence project. Additionally, the park has established the Curry Village Rockfall Hazard Zone, which has resulted in the loss of historic structures. These structures are being documented under a separate MOA.

***Future Actions***

Impacts from future actions would be similar to those discussed for past and present actions as a mix of beneficial and adverse impacts to historic resources. The Curry Village Rehabilitation of Historic Cabins with Bath Structures, seismic upgrade to the Ahwahnee Dormitory, and efforts to stabilize the floor of the Ahwahnee Hotel, all consist of potential future actions with the potential to affect historic resources within the park.

***Overall Cumulative Impact***

Alternative 5 would involve the demolition or alteration of several National Register-eligible or -listed structures and historic districts (Merced Lake High Sierra Camp, the Yosemite Valley Historic District, Yosemite Village Historic District, and Yosemite Valley Bridges Historic District). Additionally, actions common to Alternatives 2–6 would involve the relocation or alteration of several National Register-eligible, listed, or National Historic Landmark structures (the NR Ahwahnee Hotel, Superintendent's House [Residence 1], Camp Curry Historic District, and Camp 4). The alteration or removal of these resources would potentially result in a long-term, moderate, adverse impact on both the individual cultural resources and the cumulative historic character of the Merced River corridor. While all site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park's proposed Merced River Plan programmatic agreement, the potential effect on the character-defining features of historic resources within the river corridor would result in long-term, moderate, local adverse cumulative impacts on historic resources.

***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration*****All River Segments*****Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values across all river segments under Alternative 6 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

No actions to manage visitor use and facilities across all river segments under Alternative 6 would result in an adverse effect on historic resources. None of the proposed actions would affect the character-defining features of a historic building, structure, or district.

#### **Segment 1: Merced River Above Nevada Fall**

### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values within Segment 1 under Alternative 6 would result in an adverse effect on historic resources. None of these actions would affect the character-defining features of a historic building, structure, or district.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

No actions to manage visitor use and facilities within Segment 1 under Alternative 6 would result in an adverse effect on historic resources. None of these actions would affect the character-defining features of a historic building, structure, or district.

#### **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Table 9-240 describes impacts of actions intended to protect and enhance river values in Segment 2 under Alternative 6.

**Biological Resource Actions.** Biological resource actions to protect and enhance river values in Segment 2 under Alternative 6 would result in moderate or beneficial, local, long term adverse impacts on the listed Yosemite Valley Historic District under NEPA through impacts to the contributing resources of Valley Loop Trail, Slaughterhouse and Bridalveil Meadows, and an adverse effect to the Yosemite Valley Historic District under NHPA. No NHL would be affected.

**Hydrologic/Geologic Resource Actions.** Hydrologic/geologic resource actions to protect and enhance river values in Segment 2 under Alternative 6 would result in minor adverse impact on both the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA, and no adverse effect on the Yosemite Valley Historic District or Yosemite Valley Bridges Historic District under NHPA. No NHL would be affected.

**Cultural Resource Actions.** Cultural resource actions to protect and enhance river values in Segment 2 under Alternative 6 would result in a negligible, long term, local, adverse impact on the Yosemite Valley and Yosemite Village Historic Districts under NEPA, and no adverse effect on the Yosemite Valley or Yosemite Village Historic Districts under NHPA through impacts resulting from the rehabilitation of the contributing resource of the Superintendent's House. No NHL would be affected.

**TABLE 9-240: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 6**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Restoration of El Captain Meadow would result in no adverse effect to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. The El Captain Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p><i>NEPA:</i> The restoration of the meadow to its historic setting would result in a long term, local, beneficial effect to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The restoration of the meadow would improve the condition of a resource and would result in no adverse effect to the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Rerouting the Valley Loop Trail, including the construction of boardwalks through sensitive habitat in Slaughterhouse and Bridalveil Meadows, has the potential to affect both these contributors to the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Valley Loop Trail is one of the primary trails originating in the valley. The Valley Loop Trail dates from the 1920s and was originally built as a bridle trail, generally aligned along existing circulation routes. Thirteen additional miles were added to the Valley Loop Trail in 1928, requiring the construction of 14 bridges. Today, the Valley Loop Trail includes the entire remaining bridle trail system in the valley and it is approximately 21 miles long (Criterion A). The Slaughterhouse Meadow is a contributing site to the Yosemite Valley Historic District as a characteristic landscape feature in the Valley (NPS 2006d).</p> <p>The Valley Loop Trail and Slaughterhouse and Bridalveil Meadows are contributors to the National Register-listed Yosemite Valley Historic District. Rerouting the Valley Loop Trail could alter these historic resources. Any sections of Valley Loop Trail that would be rerouted would require additional analysis prior to construction or demolition. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation)), but without the above described analysis. A determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning.</p>

**TABLE 9-240: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Bridges Historic District (1977000160), Yosemite Valley Historic District (2004001159)	In order to address river flow concerns, Stoneman Bridge would be left in place, but engineer solutions, such as installation of large wood or culverts to Northside Drive would be installed. In the event that these solutions do not resolve impacts to the condition of the river, more aggressive solutions may be pursued. This would result in an effect to a contributing structure to this historic district.	<p>Bridges have been a major component of the cultural landscape of the Yosemite Valley from the first years of Non-indigenous settlement. The Yosemite Valley Bridges Historic District consists of 8 granite-faced, concrete arch road bridges on the Valley floor, constructed between 1921 and 1933. The Valley bridges are unique for their architectural design and aesthetic considerations, representing an effort to build structures in the national parks which are simple and uniform in design to blend in with the environment (Criterion C) (Wilson, 1977). This bridge is also a contributor to the Yosemite Valley Historic District.</p> <p><i>NEPA:</i> The installation of engineered solutions in the vicinity of Stoneman Bridge may alter the historic setting of a contributor to the historic Yosemite Valley Bridges Historic District and Yosemite Valley Historic District. If culverts were installed in the vicinity of Stoneman Bridge, the culverts would be installed following Yosemite Design Guidelines and mitigation measure HIST-1, and should not affect the historic setting of the bridge, resulting in a negligible, long-term, local, adverse impact on the Yosemite Valley Bridges Historic District and Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The installation of engineered solutions in the vicinity of Stoneman Bridge may alter the historic setting of a contributor to the historic Yosemite Valley Bridges Historic District and Yosemite Valley Historic District. If culverts were installed in the vicinity of Stoneman Bridge, the culverts would be installed following Yosemite Design Guidelines and mitigation measure HIST-1, and should not affect the historic setting of the bridge, resulting in no adverse effect to the Yosemite Valley Bridges Historic District or Yosemite Valley Historic District under NHPA.</p> <p>In the event that more aggressive solutions are required, the Park will complete additional site planning to determine the extent of impacts to Stoneman Bridge. While this action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation), without finalized designs is not possible to determine the impact of this action under NEPA/NHPA.</p>

**TABLE 9-240: IMPACTS OF ACTIONS INTENDED TO PROTECT AND ENHANCE RIVER VALUES IN SEGMENT 2 UNDER ALTERNATIVE 6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Cultural Resource Actions</b>				
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159); Yosemite Village Historic District	Rehabilitation of the Superintendent's House in its existing location to preserve the historic fabric while preparing the structure to withstand periodic flooding would result in no adverse effect to the contributor to the Yosemite Valley and Yosemite Village Historic Districts.	<p>Yosemite Village has one of the largest and most significant collections of NPS Rustic style buildings in the national park system, with both concessioner and NPS buildings representing a range of rustic types and building materials (Criterion 3). The Superintendent's House is a contributor to the Yosemite Valley Historic District and the Yosemite Village Historic District (Donahoe 1994).</p> <p><i>NEPA:</i> The action to rehabilitate the Superintendent's House in its historic location and preparing the structure to withstand periodic flooding would be taken consistent with the Secretary of the Interior Standards for Rehabilitation as well as guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The rehabilitation of the building would result in a negligible, long term, local, adverse impact.</p> <p><i>NHPA:</i> The action to rehabilitate the Superintendent's House in its historic location and preparing the structure to withstand periodic flooding would be taken consistent with the Secretary of the Interior Standards for Rehabilitation as well as guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The action will have no adverse effect on the Yosemite Valley and Yosemite Village Historic Districts under NHPA.</p>



### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Table 9-241** describes impacts of actions intended to manage visitor use and facilities in Segment 2 under Alternative 6.

**Curry Village.** Project level actions to manage visitor use and facilities in the Curry Village area would include the replacement of 90 tent cabins and 14 cabins without baths in Boys Town with 78 new hard-sided units, and formalizing the Curry Orchard Parking area. As described in table 9-241 below, actions to remove housing, formalization of Curry Orchard Parking, and reroute Southside Drive would result in a long term, local, major adverse impact to the Camp Curry and Yosemite Valley Historic Districts under NEPA. These actions would result in an adverse effect to the Camp Curry and Yosemite Valley Historic Districts through alterations to contributing historic properties under NHPA.

**Yosemite Lodge and Camp 4.** Project level actions to manage visitor use and facilities in the Yosemite Lodge and Camp 4 areas would include alterations to Yosemite Lodge, such as the redesign of parking areas, removal of existing buildings and facilities, construction of new employee housing, and repurposing of existing buildings. As described in table 9-241 below, Yosemite Lodge was identified as being a non-contributing site within the Yosemite Valley Historic District. However, it has not been evaluated for its post-WWII significance under the 50-year rule for the inventorying of historic properties for the National Register, and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO during future site planning. Impacts to the Yosemite Valley Historic District through the construction of new facilities within the district would result in a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA, and no adverse effect under NHPA.

**Yosemite Village and Housekeeping Camp.** Actions in the Yosemite Village area include the relocation and formalization of the parking lot and re-routing Northside Drive at Yosemite Village Day-Use Parking area, construction of roundabouts and a pedestrian underpass at Yosemite Village Day-Use Parking area, and removal of facilities from Housekeeping Camp. As described in table 9-241 below, these actions would have a moderate, local, long term adverse impact to the listed Yosemite Valley Historic District under NEPA, and an adverse effect to the Yosemite Valley Historic District under NHPA.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, actions intended to protect and enhance river values in Segments 3 and 4 would not be likely to result in adverse effects on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district. Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

**TABLE 9-241: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 6**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 2	Actions to Protect and Enhance River Values	Yosemite Valley Historic District (2004001159)	Construction of additional housing or facilities would result in an alteration to the setting of the Yosemite Valley Historic District.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation.</p> <p>The introduction of new permanent buildings, facilities, or additional parking has the potential to alter the setting of the Yosemite Valley Historic District. This includes actions such as increased parking at Lost Arrow and West Valley Overflow, and camping at Upper Pines and the former Lower River Campground. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed in compliance with the proposed Merced River Plan PA and a determination of effect under both NEPA and NHPA would occur after a determination of eligibility is completed and concurred upon by SHPO and during future site planning.</p>
<b>Curry Village</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The replacement of 90 tent cabins and 14 cabins without baths in Boys Town with 98 new hard-sided units (duplex/fourplex) would remove all 73 contributing historic canvas tent cabins (5 to be relocated), 14 (of 16) contributing historic bungalows.	<p>The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). While contributors to the Yosemite Valley Historic District, the 16 Boys Town employee tents (and 73 Camp Curry Employee Canvas Cabins) on the north side of the road does not create an important space in the overall organization of the Camp Curry developed area, although it does possess its own, distinctive character (NPS 2006d).</p> <p><i>NEPA:</i> The removal of tent cabins and cabins from Boys Town would affect the Yosemite Valley Historic District. The loss of these buildings would alter</p>

**TABLE 9-241: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p>the historic setting of Yosemite Valley Historic District. The loss of the cabins would result in the loss of 14 of 302 contributing buildings to the Yosemite Valley Historic District, and 73 of the over 600 contributing structures (of 902 total contributing resources). Mitigation will be consistent with that proposed in the Curry Village Rockfall Hazard MOA, including updating the National Register Nomination forms for both the Yosemite Valley Historic District and the Camp Curry Historic District to reflect changes to the districts, landscape and architectural documentation of Curry Village, salvage of materials where ever possible, and the preparation of interpretive materials. The action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The proposed action would result in a long term, local, major adverse effect to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The removal of tent cabins and cabins from Boys Town would affect the Yosemite Valley Historic District. The loss of the cabins would result in the loss of 14 of 302 contributing buildings to the Yosemite Valley Historic District, and 73 of the over 600 contributing structures (of 902 total contributing resources). This action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation) as well as the Historic Preservation Treatment Procedures outlined in Appendix J. Mitigation will be consistent with that proposed in the Curry Village Rockfall Hazard MOA, including updating the National Register Nomination forms for both the Yosemite Valley Historic District and the Camp Curry Historic District to reflect changes to the districts, landscape and architectural documentation of Curry Village, salvage of materials where ever possible, and the preparation of interpretive materials. This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The formalization of the Curry Orchard Day Use Parking area would result in the removal of historic trees and alteration of a contributor to the Yosemite Valley Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). The cultural landscape of Yosemite Valley features nationally significant examples of architecture. Camp Curry is a rare example of a surviving tent cabin complex of the type that was once common in many parks (Criterion C). In 1927, the Park

**TABLE 9-241: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Curry Village (cont.)</b>				
Segment 2 (cont.)				<p>addressed a growing problem with parking by converting a nearby apple orchard into a unique parking area for Curry Village. Curry Orchard Day Use Parking area is a contributing site to the Yosemite Valley Historic District, but not the Camp Curry Historic District (NPS 2006d; Hart, 1979).</p> <p><i>NEPA:</i> Efforts to formalize parking within the Curry Orchard parking lot would affect historic trees, as well as a contributing resource to the Yosemite Valley Historic District. All trees will be removed during formalization of the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action would result in a long term, local, moderate adverse effect to the Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> Efforts to formalize parking within the Curry Orchard parking lot would alter historic trees, as well as the parking area as a contributing resource to the Yosemite Valley Historic District. All trees will be removed during formalization of the parking lot. This action would be completed consistent with management practices outlined in the Orchard Management Guidelines and guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). This action will have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
<b>Yosemite Village and Housekeeping Camp</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The relocation and formalization of the parking to the north of the road and re-routing Northside Drive south of the parking at Yosemite Village Day-Use Parking area would affect historic circulation patterns in the Yosemite Valley Historic District.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Northside and Southside drives create a framework for circulation around the valley, on either side of the Merced River, and are contributing structures to the Yosemite Valley Historic District. The historic circulation of Yosemite Village is predominantly centered on Village Drive between Northside Drive and Village bike path (NPS 2006d). Northside Drive is not a contributor to the Yosemite Village Historic District (Donahoe 1994).

**TABLE 9-241: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The re-routing of Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns as well as alteration of a contributing resource (Northside Drive). The road realignment will include a small segment of the entire length of Northside Drive. This action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The formalization of the parking lot will occur within the existing developed former footprint of the Concessioner GO and the Concessioner Garage. The realignment of Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns. The road realignment will include a small segment of the entire length of Northside Drive. This action would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The alteration of a contributing resource would have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Valley Historic District (2004001159)	The construction of vehicular roundabouts at Northside Drive and Sentinel Drive (Bank 3-Way) and Northside Drive and Village Drive at Yosemite Village Day-Use Parking area would affect historic circulation patterns.	The cultural landscape of Yosemite Valley is nationally significant under National Register criteria A and C. The valley floor landscape as a whole is nationally significant in the themes of outdoor recreation, tourism, and conservation. Many recreational trends, including sightseeing, camping, auto camping, mountaineering, winter sports, and others began or were significantly advanced at Yosemite (Criterion A). Circulation within Yosemite Valley consists of a variety of vehicular, pedestrian, and equestrian routes. Northside and Southside drives create a framework for circulation around the valley, on either side of the Merced River (NPS 2006d). The historic circulation of Yosemite Village is predominantly centered on Village Drive between Northside Drive and Village bike path (NPS 2006d). Northside Drive is not a contributor to the Yosemite Village Historic District (Donahoe 1994).

**TABLE 9-241: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				<p><i>NEPA:</i> The construction of the roundabouts at Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns. The addition will impact proportionally small segments of the entire lengths of Northside and Village Drives. These actions would comply with guidance to be established through development of a Programmatic Agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The proposed action will have a moderate, local, long term adverse impact on the listed Yosemite Valley Historic District under NEPA.</p> <p><i>NHPA:</i> The construction of the roundabouts at Northside Drive would affect the Yosemite Valley Historic District through alteration of historic circulation patterns. The addition will include a proportionally small segments of the entire lengths of Northside and Village Drives. These actions would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan (or standard 36 CFR Part 800 consultation). The alteration of a contributing resource would have an adverse effect on the Yosemite Valley Historic District under NHPA.</p>
Segment 2	Actions to Manage Visitor Use and Facilities	Housekeeping Camp	Removal of buildings from Housekeeping Camp would potentially result in the removal of a historic resource.	<p>The Housekeeping Camp area developed after 1942, and consists of closely sited, rustic cinderblock and canvas tent cabins. Service buildings include a camp store and laundry and shower facilities, all built after 1942. This area has not been evaluated for eligibility as a National Register-eligible resource.</p> <p>The removal of 34 lodging units and other facilities out of the observed ordinary high water mark could affect historic resources. Housekeeping Camp has not been previously evaluated as a National Register-eligible resource. The Park will complete NHPA section 110 prior to this action, with a DOE completed prior to site planning. Additional consultation (tribal or SHPO) would also be required. In the event that the property is found eligible, planning and design efforts would be reassessed prior to construction in order to ensure that the park has attempted to avoid, minimize or mitigate any potentially adverse impacts to the historic property. This action would be completed consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or standard 36 CFR Part 800 consultation. The park will complete a Determination of Eligibility prior to implementing the selected action. This</p>

**TABLE 9-241: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 UNDER ALTERNATIVE 6 (CONTINUED)**

Segment	Action Type	National Register Listed or Eligible Property	Action and Impact to Resource	Analysis under NEPA/NHPA
<b>Yosemite Village and Housekeeping Camp (cont.)</b>				
Segment 2 (cont.)				action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under both NEPA and NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.
<b>Yosemite Lodge and Camp 4</b>				
Segment 2	Actions to Manage Visitor Use and Facilities	Yosemite Lodge	Construction of new employee housing or parking in the vicinity of Yosemite Lodge or the removal of existing buildings within the floodplain would potentially result in the removal of a historic resource.	In 1956, the Yosemite Lodge was completely rebuilt and most of the old lodge buildings were demolished. The Yosemite Lodge is almost entirely the product of postwar planning and construction, but has not been evaluated for eligibility as a National Register-eligible resource (NPS, 2006).  The construction of additional employee housing or parking in the vicinity of Yosemite Lodge or removal of existing buildings could affect historic resources. Yosemite Lodge has not been evaluated for NR eligibility as a Mission 66 resource. The park will complete a Determination of Eligibility prior to implementing the selected action. This action would be completed in compliance with the proposed Merced River Plan programmatic agreement. A determination of effect under both NEPA and NHPA would be required to inform the planning/design process after a Determination of Eligibility is completed and concurred upon by the SHPO.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Table 9-242** describes impacts of actions intended to manage visitor use and facilities in Segments 3 and 4 under Alternative 6.

Actions to manage visitor use and facilities in Segments 3 and 4 under Alternative 6 would result in minor, long term, local adverse impacts on historic resources in El Portal under NEPA.

**Segments 5, 6, 7, and 8: South Fork Merced River**

***Impacts of Actions to Protect and Enhance River Values***

No actions intended to protect and enhance river values under Alternative 6 in Segments 5, 6, 7, and 8 are anticipated to result in an adverse effect on historic resources. These actions would not involve activities that would affect the character-defining features of a historic building, structure, or district. Impacts common to Alternatives 2–6 are discussed earlier in this section under “Environmental Consequences Common to Alternatives 2–6.”

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Table 9-243** describes impacts of actions intended to manage visitor use and facilities in Segments 5, 6, 7 and 8 under Alternative 6.

Actions to manage visitor use and facilities in Segments 5, 6, 7 and 8 under Alternative 6 would result in minor, long term, local adverse impacts on historic resources in El Portal under NEPA and no adverse effect under NHPA.

**Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Alternative 6 would result in the fewest adverse effects on historic resources; however, some of the management actions under Alternative 6 could adversely affect known historic resources through demolition, alteration, and relocation related to restoration, construction, and facilities removal. Identified historic resources that would be affected by Alternative 6 management actions include the Camp Curry Historic District, the Yosemite Valley Historic District, and the Yosemite Valley Bridges Historic District. **Table 9-244** summarizes the impacts to these historic resources. These impacts would include altering character-defining features or historic context, or potentially demolishing contributing resources to NRHP-listed or eligible districts. These actions could cause long-term, adverse minor effects on historic buildings, sites, and districts.



**TABLE 9-242: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 3 AND 4 UNDER ALTERNATIVE 6**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 4	Actions to Manage Visitor Use and Facilities	El Portal	The construction of additional concessioner housing in the Rancheria area of El Portal has the potential to alter the historic setting of potential historic resources in El Portal.	<p>El Portal is a small community comprised of 1200 acres of land on both the north and south sides of the Merced River and Highway 140. In 1961 the National Park Service began building housing in Rancheria Flat, west of El Portal as part of the Mission 66 initiative in the National Park Service. The Rancheria Mission 66 area has been recommended as a historic district as part of a historic resource study identifying potentially eligible properties in El Portal, but has not yet received SHPO concurrence (NPS 2011r).</p> <p>The construction of new housing in the Rancheria area of El Portal has the potential to alter the historic setting of the area and any potential historic resources not currently eligible or listed by the Park. A historic resource study identifying potentially eligible properties in the vicinity of El Portal has been completed by park staff (NPS 2011r). This study provides the park with enough research/information to identify potentially eligible resources that will need further Section 110 inventory/analysis to confirm eligibility before forwarding to the SHPOs office for review and concurrence.</p>

**TABLE 9-243: IMPACTS OF ACTIONS INTENDED TO MANAGE VISITOR USE AND FACILITIES IN SEGMENTS 5, 6, 7 AND 8 UNDER ALTERNATIVE 6**

Segment	Action Type	Potential Historic Resource	Action and Impact to Resource	Analysis under NEPA/NHPA
Segment 7	Actions to Protect and Enhance River Values	Wawona	The closure of the stables in Wawona would affect contributors to the Pioneer Yosemite History Center.	<p>The Wawona Hotel and Pavilion's architectural importance to American architecture is as the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity (Criterion C). A Cultural Landscape Inventory completed for the Pioneer Yosemite History Center includes the Wawona Stables as a contributing resource.</p> <p><i>NEPA:</i> The closure of the Wawona stables would alter the Pioneer Yosemite History Center. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The proposed action would result in a long term, local, minor adverse effect Pioneer Yosemite History Center under NEPA.</p> <p><i>NHPA:</i> The closure of the Wawona stables would alter the Pioneer Yosemite History Center. Operations of the Wawona stables would cease, but the structures would remain and the area would be converted to use as the site of the relocated Wawona stock use campground. The action would be taken consistent with guidance to be established through development of a programmatic agreement for the Merced River Plan or the standard 36 CFR Part 800 consultation. The action would have no adverse effect on the Pioneer Yosemite History Center under NHPA.</p>

**TABLE 9-244: IMPACT SUMMARY TO HISTORIC RESOURCES UNDER ALTERNATIVE 6**

Historic District	Types of Impacts	Overall Impact Summary (NEPA)	Overall Impact Summary (NEPA)
Camp Curry Historic District	Demolition of contributing buildings.	long term, moderate, local, adverse impact	Adverse effect
Yosemite Valley Historic District	Rerouting of historic roads and trails, removal of historic buildings and facilities, construction of new buildings and facilities,	long term, moderate, local, adverse impact	Adverse effect
Yosemite Village Historic District	Rerouting of historic roads, removal of historic buildings	long term, moderate, local, adverse impact	Adverse effect
Yosemite Valley Bridges Historic District	alteration of setting of historic bridge	long term, minor, local, adverse impact	No adverse effect
Pioneer Yosemite History Center	Closure of operations at a contributing site	long term, minor, local, adverse impact	No adverse effect

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

#### ***Past Actions***

Past actions have resulted in a range of beneficial and adverse impacts. Beneficial impacts of past actions include extensive actions to preserve and maintain historic resources, including the Camp Curry Historic District (Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation), as well as restoration of meadows associated with the Yosemite Valley Historic District (Cook's Meadow). Adverse effects include the removal of the NR eligible Cascades area houses.

#### ***Present Actions***

Present actions contribute to a mixture of beneficial and adverse impacts. These impacts include efforts to restore, preserve, and protect the historic integrity and character-defining features of The Ahwahnee NHL while completing long-term rehabilitation of the building and associated features, construction of the Wawona fire station, Camp 4 relocating eight campsites, and the Ahwahnee Hotel Porte Cochère Access Walkways and Fence project. Additionally, the park has established the Curry Village Rockfall Hazard Zone, which has resulted in the loss of historic structures. These structures are being documented under a separate MOA.

#### ***Future Actions***

Impacts from future actions would be similar to those discussed for past and present actions as a mix of beneficial and adverse impacts to historic resources. The Curry Village Rehabilitation of Historic Cabins with Bath Structures, seismic upgrade to the Ahwahnee Dormitory, and efforts to stabilize the floor of the Ahwahnee Hotel, all consist of potential future actions with the potential to affect historic resources within the park.

*Overall Cumulative Impact*

Under Alternative 6, the park would alter several National Register-eligible or -listed structures or districts (Yosemite Valley Historic District, Yosemite Valley Bridges Historic District, and Camp Curry Historic District). Additionally, actions common to Alternatives 2–6 would involve the relocation or alteration of several National Register-eligible, listed, or National Historic Landmark structures (the NR Ahwahnee Hotel, Superintendent’s House [Residence 1], Camp Curry Historic District, and Camp 4). The alteration of these resources would potentially result in a long-term, minor, adverse impact on both the individual cultural resources and the cumulative historic fabric of the Merced River corridor. While all site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park’s proposed Merced River Plan programmatic agreement, the potential effect on the character-defining features of historic resources within the river corridor would result in a long-term, moderate adverse cumulative impact on historic resources.

## **Archeological Resources**

Archeological sites are important for their cultural value and for the information they can provide regarding prehistoric and historic lifeways. Culturally associated tribes and groups attach significance to prehistoric and historic sites for their religious and cultural value as tangible links to their heritage. Common objects that indicate the presence of prehistoric archeological sites within Yosemite include: scatters of stone tools (primarily of obsidian and often called lithic scatters); food processing features known as bedrock mortars; milling implements called ground stone artifacts; rock shelters; architectural features; fire hearths; rock alignments; artifact caches; evidence of daily refuse midden sediments; rock art; animal faunal remains indicating diet; and human remains. Historic-era sites related to continued occupation of the area by American Indians may also contain some of these cultural remains, in addition to artifacts of metal, glass, and other items that arrived with non-native settlers. Historic-era archeological sites of all cultural origins provide important information not available in written records, such as early building construction techniques, lifestyles of early inhabitants, trade and procurement of goods and materials, and interactions between non-native and native peoples.

## ***Affected Environment***

### **Regulations and Policies**

Numerous federal laws, statutes, and regulations have been enacted to protect the country's cultural heritage. The most applicable regulations to the proposed undertaking are summarized below. In addition, NPS has several internal policies, also listed here.

*Section 106 of National Historic Preservation Act* (1966 as amended). Under NHPA and its implementing regulation, Protection of Historic Properties (36 CFR 800), a cultural resource is considered significant if it meets the Criteria for Evaluation (36 CFR 60) for the National Register of Historic Places (National Register).

Prior to implementing an “undertaking” (i.e., “a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval”), section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer a reasonable opportunity to comment on any undertaking that would potentially affect properties listed or eligible for listing in the National Register. The lead federal agency is responsible for project compliance with section 106 of the NHPA.

The National Register was established by the NHPA of 1966, as “an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation's historic resources and to indicate what properties should be considered for protection from destruction or impairment” (36 CFR 60.2). The National Register recognizes both historic-era and prehistoric properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archeology, engineering, or culture. As indicated in section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural importance to culturally associated groups are eligible for inclusion in the National Register. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (36 CFR 60.4):

- A. are associated with events that have made a significant contribution to the broad patterns of our history;
- B. are associated with the lives of persons significant in our past;
- C. embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for national register listing (36 CFR 60.4).

In addition to meeting the criteria of significance, a property must have integrity, meaning the ability of a property to convey its significance. The National Register recognizes seven qualities that, in various combinations, define integrity. To retain integrity a property must possess several of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association (36 CFR 60.4).

*Cultural Resources Management Plan (1973).* The Cultural Resources Management Plan completed for the Yosemite General Management Plan was designed to protect the significant cultural resources of the park through compliance with all cultural resource legislative, executive, and regulatory requirements. The Cultural Resources Management Plan provides specific policies to guide cultural resources management at Yosemite, including consultation, survey and evaluation, preservation/restoration/reuse, and documentation.

The *Archaeological Resources Protection Act of 1979* prohibits unauthorized excavation of archeological sites on federal land, as well as other acts involving cultural resources, and implements a permitting process for excavation of archeological sites on federal or Indian lands. This act also establishes provisions for civil and criminal penalties for removal of, or damage to, archeological and cultural resources.

*1999 Programmatic Agreement.* Yosemite National Park, in consultation with the ACHP, the California SHPO, American Indian tribes, and the public, has developed a programmatic agreement for planning, design, construction, operations, and maintenance activities. This programmatic agreement provides a process for compliance with NHPA and includes stipulations for identification, evaluation, treatment, and mitigation of adverse effects for actions affecting historic properties, including potentially eligible historic properties. Under the 1999 PA, the park is obligated to “make every reasonable effort to avoid adverse effects to Historic Properties . . . through project design, facilities’ location, or other means.

Avoidance alternatives will be documented during the NEPA process.” The park will follow stipulations of this programmatic agreement for all future planning and design projects. The 1999 programmatic agreement allows the NPS to implement standard mitigating measures for some actions if the SHPO and the public are notified and provided an opportunity to comment. This programmatic agreement expires in 2014, and if a new programmatic agreement is not completed, the 2008 nationwide programmatic agreement in conjunction with standard compliance under 36 CFR 800 will provide guidance for park activities.

*2008 Programmatic Agreement.* This programmatic agreement provides nationwide coordination between the NPS, the ACHP, and the National Conference of SHPOs for the section 106 compliance process. The NHPA, 36 CFR 800, and the programmatic agreement provide the NPS with a roadmap to plan for and carry out undertakings to minimize harm to cultural resources.

*Proposed Merced River Plan Programmatic Agreement.* As a part of the current Merced Wild and Scenic River Comprehensive Management Plan, the Park is proposing, via consultation with the ACHP, SHPO, and culturally associated groups, the creation of a programmatic agreement regarding treatment of historic resources under the proposed management plan Merced River PA. This document, while not yet finalized, will provide guidance for the identification, evaluation, treatment, and mitigation of adverse effects for actions affecting historic properties, including potentially eligible historic properties, impacted by all future planning and design projects of the Merced River Plan. The PA will recognize that all people, and especially traditionally associated cultures have values assigned to archeological sites beyond their potential for data and information. Archeological sites could hold significance under criteria A through C, as well as D. These values are addressed in a separate section of this document.

The *Native American Graves Protection and Repatriation Act (NAGPRA) of 1990* (25 USC 3001 et seq.) provides for the protection and return of Native American and Native Hawaiian human remains, funerary objects, sacred objects, and objects of cultural patrimony, and establishes ownership hierarchy for human remains and associated artifacts found on federal lands. NAGPRA also sets penalties for violations of the act, calls for cultural resource inventories of federal agency holdings and federally funded repositories, and contains provisions for the return of specified cultural items to the appropriate Native American tribe(s) and/or Native Hawaiian organizations. NAGPRA is initiated when a project and the finds are situated on federal lands.

*CFR 36 2.1* provides for the preservation of natural, cultural, and archeological resources. These regulations prohibit possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state living or dead wildlife, plants, or cultural or archeological resources; and walking on, climbing, entering, etc. an archeological or cultural resource.

*Director’s Order 28 Cultural Resources Management Guideline* (1998) guides the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the *NPS Management Policies*. It also ensures that the NPS comply with the substantive and procedural requirements described in the Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation. Additionally, the NPS will comply with the 2008 programmatic agreement with the ACHP and the National Conference

of SHPOs. The NPS published the *2006 Management Policies* relating to the systemwide treatment of various types of resources on NPS lands. The following are some specific policies related to resources of the types discussed in the Director's Order; other sections within the *Management Policies* describe the processes for consultation with traditionally associated peoples:

**5.3.5 Treatment of Cultural Resources.** The Park Service will provide for the long-term preservation of, public access to, and appreciation of the features, materials, and qualities contributing to the significance of cultural resources. With some differences by type, cultural resources are subject to several basic treatments, including: (1) preservation in their existing states; (2) rehabilitation to serve contemporary uses, consistent with their integrity and character; and (3) restoration to earlier appearances by the removal of later additions and replacement of missing elements.

**5.3.5.1 Archeological Resources.** Archeological resources will be managed in situ, unless the removal of artifacts or physical disturbance is justified by research, consultation, preservation, protection, or interpretive requirements. Preservation treatments will include proactive measures that protect resources from vandalism and looting, and will maintain or improve their condition by limiting damage due to natural and human agents.

**5.3.5.2 Cultural Landscapes.** Treatment decisions will be based on a cultural landscape's significance over time, existing conditions, and use. Treatment decisions will consider both the natural and built characteristics and features of a landscape, the dynamics inherent in natural processes and continued use, and the concerns of traditionally associated peoples. The treatment implemented will be based on sound preservation practices to enable long-term preservation of a resource's significant features, qualities, and materials. There are three types of treatment for extant cultural landscapes: preservation, rehabilitation, and restoration.

**5.3.5.3 Ethnographic Resources.** Park ethnographic resources are the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated with a park for two or more generations 40 years, and whose interests in the park's resources began before the park's establishment. Living peoples of many cultural backgrounds—American Indians, Inuit Eskimos, Native Hawaiians, African Americans, Hispanics, Chinese Americans, Euro-Americans, and farmers, ranchers, and fishermen—may have a traditional association with a particular park.

*Executive Order 11593: Protection and Enhancement of the Cultural Environment.* Executive Order 11593 instructs all federal agencies to support the preservation of cultural properties. It directs them to identify and nominate cultural properties in Yosemite to the NRHP and to “exercise caution... to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered” NPS (1971).

## Scope of the Analysis

The area now comprising Yosemite National Park has been inhabited by people for thousands of years. Some preliminary evidence from the El Portal area indicates people may have been living in the region as long as 9,500 years ago. The park area contains hundreds of archeological sites, representing the known duration of human occupation of the park (Hull and Moratto 1999). There is evidence of



technological change through time, a highly developed trade network, at least one population replacement, and resource management through the use of fire (Hull and Moratto 1999).

Through study of information provided on Geographic Information System (GIS), researchers estimate that approximately 12% of park lands have been systematically inventoried for archeological resources, and approximately 1,900 archeological sites have been documented (YNP 2010). A greater proportion of the inventories focus on lower elevation developed areas and road corridors, although some wilderness areas have been surveyed. In most cases, inventories have been conducted in support of park road, trail, and facility construction and maintenance, fire management, or restoration projects as part of the environmental and historic preservation planning and compliance processes. The most recent comprehensive overview of archeological resources and their information value is presented in *Archeological Synthesis and Research Design, Yosemite National Park, California* (Hull and Moratto 1999). The synthesis summarizes the results of past archeological research, and presents research questions and methodologies for furthering understanding of prehistoric and historic-era lifeways in the Yosemite region.

An area of potential effects (APE) describes the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The APE includes the .25 mile river boundary in addition to a 1.5 mile boundary on either side of the river. This APE encompasses the entirety of all National Register listed or National Register eligible properties located partially or entirely within the river corridor. This APE was identified in a letter to the State Historic Preservation Officer dated April 12, 2012. Concurrence on the APE was documented in a letter dated September 17, 2012.

Although land use in the early and mid-20th century has altered the landscape and affected archeological deposits in many places, YNP retains many significant archeological resources. Many archeological sites discussed below are on the National Register, or are eligible for the National Register. Three areas in particular stand out: Yosemite Valley National Register District, Wawona Archeological District, and the El Portal Archeological District. Some sites within these Districts are individually eligible, but as they are included in the district nomination, they are not individually nominated. These nominations were based on surface manifestations only. Since that time, the park has conducted many excavation projects, particularly in Yosemite Valley and El Portal. This work has been done on a project-specific basis, with the objective of characterizing the data potential of archeological deposits, and their contribution (or not) to existing archeological districts. Archeological research has shown that there is a high potential for deep or buried sites in many areas, especially in Yosemite Valley. Review of actions must take into consideration the methods, findings, and any inadequacies of previous surveys or excavations.

Text below identifies general areas that may be impacted by MRP actions. Appendix J provides more specific detail, as much of the information contained within archeological resources is considered to be confidential.

### ***Segment 1: Merced River Above Nevada Fall***

According to study of GIS data (YNP 2010), approximately 15% of the Merced River corridor has been archeologically surveyed, and less than 5% of the remaining APE has been included in the

boundaries of one or more archeological surveys. Much of Segment 1 outside the immediate river corridor is steep and inaccessible, and as a result, more complete surveys have been conducted of the main stem canyon bottom and Triple Peak Fork, with little to no inventory of Merced Peak, Red Peak, and Lyell forks. Some archeological resources have been recorded. Little Yosemite Valley, in particular, was used heavily by American Indians, stock men, and later by recreationists.

Twenty-eight prehistoric sites, six historic-era sites, and two sites with components from both the prehistoric and historic eras have been recorded within Segment 1 of the river corridor. An additional 10 prehistoric sites, 1 historic-era site, and 1 historic-era trail segment have been recorded within the remainder of the APE. To date, none of these sites have been formally nominated to the National Register, or determined to be eligible for the National Register.

A branch of the old Mono Trail, the east-west link across the Sierra Nevada, passed through Little Yosemite Valley. Remains of at least two villages are evident. Little Yosemite Valley also was one of the few places where the Merced River could be crossed at high water, a crossing made possible by a huge logjam that still exists today (Greene 1987).

The remains of the Archie Leonard homestead collapsed cabin (and park boundary fence) also exist in Little Yosemite Valley, and the eastern portions above the original Yosemite Grant were grazed (NPS 1990). Cavalry trails to patrol for trespass and resources related to hunting have been documented. Merced Lake High Sierra Camp was established along Sunrise Creek in Little Yosemite Valley in 1924 as a stopping point for hikers on the way to Merced Lake. Resources associated with these activities include tree blazes (an intentional mark used to establish direction), historic-era camps, and trash scatters (NPS 1990).

### *Segment 2: Yosemite Valley*

The Yosemite Valley Archeological District consists of over 100 known sites significant for their ability to yield important information about prehistoric lifeways. Additional resources are also present in Segment 2 beyond those that contribute to the archeological district. Early archeological surveys of Yosemite Valley focused on prehistoric or historic-era Indian sites rather than historic-era resources representative of homesteading, visitor, and NPS facilities. The entire Valley has been surveyed to some extent for prehistoric resources, except for wet meadows, areas of impenetrable vegetation, and some talus slopes. As a result, study of GIS data (YNP 2010) suggests that approximately 70% of the Merced River corridor in Segment 2 has been subject to some degree of formal archeological survey. Surveys within the remainder of the APE outside the river corridor are scarcer because of the steep and inaccessible slopes on the margins of the Valley. Approximate survey coverage in these areas averages 10%.

Due to changes in groundcover and vegetation patterns, as well as more refined survey techniques and standards since the original (1970s) inventories, it is likely that more previously undocumented, prehistoric resources exist in the Valley. Over the past 15 to 20 years, historic-era resources have been more consistently inventoried than in the past. Some historic-era archeological deposits have been documented, and areas of known land use are documented on historical base maps. As of this writing, 60 prehistoric resources have been recorded within the river corridor in Segment 2 as well as 23

historic-era sites and 31 sites with components from both prehistoric and historic eras. An additional 41 prehistoric sites, 6 historic-era, and 7 multicomponent sites are located outside the river corridor but within the APE. Some sites have been merged from earlier recordings and have multiple numbers assigned to them.

Anderson and Morehead (1976) wrote the nomination form for the Yosemite Valley Archeological District. The district was listed in the National Register the same year. This archeological district consists of over 100 known sites significant for their ability to yield important information about prehistoric lifeways. The district nomination also notes the area's significance for traditionally associated American Indians.

Individual sites in the archeological district vary by type, size, depth, complexity, length of occupation, variety of remains, and potential to yield important scientific information. Archeological research (Hull and Moratto 1999) provides guidance in assessing the research potential of these sites. Important research domains identified include paleoenvironment, cultural chronology, economic patterns, settlement patterns, demography, and social organization. Sites are considered significant when they contain important information that relates to these areas of inquiry.

Although the majority of archeological sites in the Valley retain a relatively high degree of integrity and therefore maintain their eligibility for listing on the National Register, many sites have been disturbed by human activity and natural processes (Hull and Kelly 1995). Visitor use has been the most widespread impact, although its effect is not as serious as other types of impacts. Due to the scarcity of easily buildable land, several archeological sites were damaged by historic-era construction of facilities and utilities. Much of the road system was developed in the early 1900s. Other visitor accommodations, such as The Ahwahnee and Camp Curry, were constructed approximately 100 years ago. Many roads, hotels, and other visitor accommodations have been constructed since 1957, and preservation of archeological resources did not begin in earnest in Yosemite until the creation of the NHPA in 1966.

### ***Segment 3: Merced River Gorge***

Study of GIS data (YNP 2010) suggests that approximately 10% of the river corridor in Segment 3 has been subject to surveys. Most surveys followed the course of the river and the highway that runs parallel to it, due to the steep and inaccessible slopes forming the edge of the canyon. Archeological resources in the Merced River gorge include 4 prehistoric and 11 historic-era sites, as well as 2 sites with components from both eras. Approximately 15% of the APE outside the river corridor in upland areas has been surveyed, resulting in the recordation of 39 prehistoric resources, 6 historic-era sites, and 5 multicomponent sites.

Volpe (1997) made recommendations for the National Register eligibility of the Merced Canyon Travel Corridor Historic District, an area of prehistoric and historic travel. Four prehistoric American Indian archeological sites are located in and adjacent to the Cascades area, and are considered to be contributing elements to this National Register eligible district. These sites are likely seasonal villages and contain features such as mortar rocks, midden soil, lithic scatters, and rock shelters (Greene 1987). Historic-era sites are associated with use of this canyon as a travel corridor and source of hydroelectric

power, and include rock quarries, dumps, worker housing at the Cascades Diversion Dam, the remains of two work camps associated with the Civilian Conservation Corps (CCC), a few unidentified structural foundations, the Cascades Powerhouse, and the Coulterville Road blacksmith shop in the talus west of Cascades, where a forge was built to serve travelers along this road. The Old El Portal Road and older El Portal Trail have also been recorded along the bottom of the gorge, with additional trails crossing upland areas. Of these, Volpe (1997) notes the CCC camps and blacksmith forge area as contributing elements to the Merced Canyon Travel Corridor district, as are the old roadways. The district was determined eligible to the National Register but has not been nominated or listed.

#### *Segment 4: El Portal*

El Portal's location between Yosemite Valley and the San Joaquin Valley made it an important place of settlement, subsistence, and trade along the Merced River. Study of GIS data (YNP 2010) suggests that approximately 70% of Segment 4 has been subject to an archeological survey, and as a result 11 prehistoric sites, 15 historic-era sites, and 15 sites with components dating to both eras have been recorded. Surveys have not been conducted in much of the remaining APE outside the river corridor because the park's boundaries do not extend beyond the river corridor through much of Segment 4, and surveys have not been conducted on the adjoining private lands. Approximately 5% survey coverage has resulted in the recordation of two prehistoric sites, three multicomponent sites, and one historic-era trail segment.

The El Portal Archeological District, listed on the National Register (Moffitt and Anderson 1976), encompasses 1,910 acres and contains 36 known sites within the Merced River corridor, including some of the oldest known deposits in the Sierra Nevada foothills. These sites have sparse but intriguing evidence of use, perhaps as old as 9,500 years, and contain data important to interpreting early settlement patterns (Hull and Moratto 1999). Most sites date to between 2500 BC and AD 1900, with several 19th- and 20th-century homesteads and settlements by American Indians. The El Portal Archeological District may contain some of the best-preserved archeological resources from this protohistoric period reflecting American Indian cultural change as a result of contact with Euro-Americans (Moffitt and Anderson 1976). Although land use in the early and mid-20th century has altered the landscape and affected archeological deposits in many places, a great deal could be learned from the remaining resources. Despite the loss of some information, the original extent and complexity of the sites, especially the prehistoric village sites, indicate that valuable information is still available. Archeological resources in the El Portal Archeological District represent an important source of data on the growth of the area as a national park, as well as on the cultural transition experienced by American Indian communities during Euro-American settlement. In addition, these resources are exceptional in their significance to the local American Indian community.

The steep, narrow canyon at El Portal includes river terraces with level lands on which American Indian villages were built. As recently as the early 1900s, local American Indian inhabitants shared the names and histories of multiple villages within present-day Segment 4, including permanent year-round settlements with large winter populations in the 18th and 19th centuries (Merriam 1917). These sites would have included family homes, traditional roundhouses for dances and ceremonies, sweat lodges, acorn granaries, and mortars cut into the granite bedrock for processing acorns and other foods Kroeber (1921). Surface remains include these bedrock mortars, house pits, and midden

deposits with lithic debris; excavations have shown that sometimes sparse surface manifestations provide little indication of the potentially high density of materials contained in subsurface deposits.

Prehistoric and historic-era American Indian burials, in both isolated locations and cemeteries, have been identified in El Portal. The presence of artifacts originating from the Great Basin and Pacific Coast indicate that El Portal was a location of continuous, far-reaching traffic and trade throughout prehistory. Eleven of the contributing sites in the El Portal Archeological District correlate with those villages named by Merriam's informants (1917). Particularly significant is the Johnny Wilson Ranch, a rare surviving example of an early 20th-century American Indian homestead and cemetery on the south side of the Merced River (Davis-King 1997). Mr. Wilson and his family occupied the 30-acre ranch, granted under the Dawes Act in 1917, until his death in 1937 (NPS 2011).

There is archeological evidence of historic-era activities in El Portal, including those associated with the early land use of El Portal as a gateway to the park. An extensive historic-era site consists of the remnants of Hennessey's Ranch, established in 1873. Remnants of the site include an orchard and rock walls as well as a prehistoric component of bedrock mortars. The ranch originally was home to an extensive farm that supplied produce to gold rush boomtowns throughout the Sierra Nevada and later to the Hotel Del Portal, contributing to the early growth of the area. El Portal also has remnants of mining operations, such as building foundations, tailings, and associated industrial refuse scatters. At the turn of the century, the Yosemite Valley Railroad brought tourists and led to the creation of the Hotel Del Portal, a stopover on the way into the Valley. The railroad also provided transport for mining and timber industries throughout its lifetime. Historic-era debris scatters, building foundations, mining and railroad remnants, and other archeological features remain from this era.

#### ***Segment 5: South Fork Merced River Above Wawona***

Study of GIS data (YNP 2010) suggests that less than 10% of Segment 5 has been surveyed for archeological resources, and less than 5% of the remaining APE outside the South Fork Merced River corridor has been inventoried. Steep slopes are frequent in this area. All five of the recorded historic-era archeological remains in Segment 5 are outside of the Merced River corridor. Fifteen prehistoric sites have been recorded within the river corridor, and an additional 17 prehistoric sites have been recorded in the remaining APE. Many of these sites are associated with the National Register-eligible Wawona Archeological District (determined to be eligible, but not yet formally listed). This District is 4,940 acres in size, spanning areas in Segments 5 to 8, and includes at least 74 archeological sites (Hammack and Anderson 1978, Darko 2011), many of which are located within the South Fork Merced River corridor. The importance of this eligible district as documented in 1978 lies in its ability to provide information pertaining to American Indian subsistence strategies, seasonal use of specific ecological zones, demographic patterns, and both prehistoric and historic-era occupation of the area (Hammack and Anderson 1978). It is likely that some sites in this district also possess additional significance not recognized at the time of their National Register nominations, both in terms of archeological information potential and traditional or cultural significance to associated American Indian groups. In addition, material cultural remains of previously under-reported ethnic groups such as African American and Chinese American are important. Historical contexts for these kinds of resources have yet to be developed. While not reflected in the existing National Register nominations, the NPS recognizes ethnicity as an aspect of significance in the Wawona Archeological District.

Wilderness areas above Wawona have regionally rare prehistoric archeological sites containing substantial rock-ring features with wooden remains. The rock-ring sites were first formally identified and reported by (Knierieman 1976), who interpreted them as protohistoric Miwok deer-hunting blinds that were created to take advantage of lines of sight along the river and the animals' attraction to local soda springs that contained essential mineral salts. Knierieman's interpretation of these features has neither been confirmed nor refuted, and the features remain enigmatic. The features were typically constructed of two or three courses of stacked rock coupled with the remains of wooden timbers that may once have formed a kind of superstructure. Associated charcoal and obsidian flaked-stone artifacts (including projectile points) have been found near some sites, reinforcing the possibility of an association with hunting activities.

### ***Segments 6 and 7: Wawona Impoundment and Wawona***

Segments 6 and 7 appear to be the most thoroughly surveyed of the South Fork Merced River corridor segments. Study of GIS data (YNP 2010) indicates that approximately 85% of the area has been subject to archeological inventory. As a result, 42 prehistoric sites, 5 historic-era sites, and 8 multicomponent sites have been recorded. Portions of the APE outside the river corridor have been surveyed with an average of 15% coverage, resulting in the recordation of an additional 16 prehistoric, 8 historic-era, and 3 multicomponent sites, plus segments of at least three separate historic-era trails. The Wawona Archeological District (described above) also extends into Segment 7.

The prehistory of the Wawona area is similar to that of the park as a whole, although most occupation by American Indians seems to have occurred somewhat earlier than in Yosemite Valley. Archeological sites range in size, and most include bedrock mortars and midden soil. At least 12 of the sites recorded as contributors to the district have 25 or more bedrock mortars with associated midden deposits, indicative of large village sites. These sites frequently occur in clusters with close spatial association. The Wawona area is sheltered from harsh winds and extreme climatic conditions by the surrounding ranges, thus allowing for possible year-round occupation. Acorn-gathering and processing apparently took place during the early fall at times of low water, as suggested by the presence of bedrock mortars in the river channel below the average mid-summer waterline. The time span of these sites is not accurately known, but it might range from before AD 500 to the historic era (Hammack and Anderson 1978).

From 1891 until 1916, the U.S. Army stationed troops at Yosemite during the summer to administer the fledgling park, enforce prohibitions on grazing and other incompatible uses, and construct much of the original park infrastructure (California Military Museum n.d.). Physical evidence of their tenure at the park can be found in the roads and trails they built, as well as other improvements such as a now-abandoned arboretum on the south side of the South Fork Merced River, west of its confluence with Big Creek (Palmer n.d.). Other historic-era archeological remains include sites related to an early hospitality and tourism industry based in the Wawona area.

### ***Segment 8: South Fork Merced River Below Wawona***

Less than 10% of the South Fork Merced River corridor in Segment 8 has been surveyed for archeological resources study of GIS data (YNP 2010). Only five prehistoric sites have been recorded, and no evidence of historic-era occupation has been found. Surveys along Wawona Road within the

APE outside the river corridor cover approximately 15% of the ground surface; this inventory has resulted in the recordation of one additional prehistoric site and a segment of the Wawona Road. Prehistoric sites in the APE represent smaller, limited-use areas, rather than permanent or seasonal villages.

### ***Environmental Consequences Methodology***

The archeological resource impact analysis in this *Merced River Plan/DEIS* is described in terminology consistent with the regulations of the Council on Environmental Quality (CEQ). CEQ regulations require that the impacts of alternatives and their component actions be disclosed. It is intended that the impact assessment will comply with the requirements of both the National Environmental Policy Act (NEPA) and section 106 of the NHPA. The determination of effect for the undertaking (implementation of the alternative) is included in the Summary of Impacts section for each alternative.

### **NEPA Compliance Methodology**

Consistent with the CEQ regulations, analysis of individual actions includes identification and characterization of potential impacts. Under NEPA, impacts on archeological resources are assessed as either adverse or beneficial. While an archeological resource cannot be restored or repaired, a beneficial impact could be assessed if the resource would be stabilized to prevent future degradation, or appropriate active intervention would be performed to preserve the elements of the resource that qualify it for National Register eligibility. NPS could take other steps to improve upon these beneficial impacts, including activities such as increasing visitor education, increasing ranger patrols in no-camping areas, and reducing overnight use.

All known archeological resources within the APE are evaluated for impacts under NEPA, regardless of their eligibility for the National Register. Even sites that do not meet National Register criteria, or that have lost most of their integrity, can still be capable of conveying past culture or history, and may therefore have value in the context of public interpretation and/or traditional cultural resources. Analyses of impacts on archeological resources for the purposes of the NEPA are based on the following.

**Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For this analysis, local impacts would be those that occur in a specific area within a segment of the Merced River. This analysis further identifies whether there would be local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the APE within Yosemite. Regional impacts would be those that extend to the Yosemite gateway region.

**Intensity.** The intensity of impact depends on the nature, location, and design of the proposed project. Intensity of impacts are described as:

- **Negligible.** Impact is barely perceptible and not measurable; confined to small areas of a particular site.

- **Minor.** Impact is perceptible and measureable; remains localized and confined to a single area of a particular site.
- **Moderate.** Impact is sufficient to cause a change in a character-defining feature; generally involves a single site or small group of sites.
- **Major.** Impact results in a substantial and highly noticeable change in character-defining features; involves a large area of one site, or groups of sites, with high to exceptional archeological value.

**Duration.** Impacts to archeological resources are described as short-term or long-term duration. Most changes to the data potential of archeological resources are permanent and would thus be characterized as having a long-term impact. Short-term impacts would consist of temporary changes to setting, association, and feeling.

**Type of Impact.** Impacts can be considered to either be adverse or beneficial, direct or indirect. Impacts are considered adverse when they have the potential to diminish significant characteristics of a resource. Specific actions, such as demolition, result in direct impacts. Indirect impacts generally occur after project completion, and result from changes in land use or pedestrian traffic patterns.

The assessment of impacts on archeological sites requires knowledge of the specific qualities of the resource that are considered culturally valuable. Under NEPA, cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency Federal or non-Federal) or person undertakes such other actions” (40 CFR § 1508.7). Cumulative impacts are generally those that take place within a specified geographic area that contains similar or related resources. NEPA also requires a discussion of mitigation, and the appropriateness and effectiveness of mitigation. To best meet these requirements, ongoing tribal consultation over the life of the project will be critical, as well as adherence to the plan-specific programmatic agreement that is currently being developed.

Archeological resources in the Merced River corridor are qualitatively analyzed based on existing knowledge, and assessing what potential modifications could alter character-defining features. Actions specific to individual alternatives that would affect these historic properties are described under each alternative.

Some assumptions were made in this analysis. For example, informal trails and high concentrations of visitor use in the vicinity of, or overlapping with, archeology sites have variable impacts depending on the depth and type of resource. For this analysis, informal trails and visitor use are assumed to be long-term, minor to moderate, adverse impacts. Additional monitoring and/or testing would be necessary to determine the extent of the disturbance to individual archeological resources.

## Section 106 Compliance Methodology

In accordance with the ACHP regulations implementing section 106 of the NHPA, effects on historic properties are identified and evaluated using the following methodologies:



- Use a proposed APE, defined above. The proposal for this area was made by the park in its letter to SHPO and the ACHP in April 2012.
- Identify cultural resources present in the APE that were either listed, eligible for listing, or otherwise identified as eligible for listing in the National Register. Any prehistoric or historic archeological site or district that is included in, or is eligible for inclusion in, the National Register is termed a historic property and is managed for protection under the NHPA. Archeological sites are generally categorized as:
  - **Non-eligible resources.** These are resources that fail to meet the criteria of the NRHP as described above.
  - **Listed resources.** Listed historic resources are those properties that the Keeper of the National Register has officially added to the National Register of Historic Places.
  - **Eligible resources.** Eligible historic resources are those which meet the criteria for listing on the National Register of Historic Places, and have been determined eligible either in concurrence with the SHPO or the Keeper of the National Register of Historic Places. Formal nomination to the National Register has not occurred.
- Apply the criteria of adverse effect on affected historic properties to the best extent possible given the current understanding of the plan.
- Consider ways to: (1) avoid; (2) if avoidance is not possible, minimize; or (3) if minimization is not possible, mitigate adverse effects.

Examples of historic properties (listed or eligible resources) include archeological sites, historic built-environment resources, archeological and historic districts, cultural landscapes, and traditional cultural properties. Historic properties that could potentially be affected by the Merced River Plan include National Register-listed archeological districts, and individual archeological sites that are listed or determined to be eligible for the National Register. Appendix J contains more details. These resources may also be considered under the Archeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, and EO 13007 (Indian Sacred Sites).

Section 106 of the NHPA requires the federal agency to consider the effects of its undertakings on historic properties and to provide the ACHP a reasonable opportunity to comment. The agency must also identify the appropriate SHPO/Tribal Historic Preservation Officers to consult with during the process. It should also plan to involve the public, and identify other potential consulting parties. Section 106 also applies to properties not formally determined eligible, but which meet eligibility requirements for the National Register and are therefore treated as eligible until a formal determination can be made.

### ***NHPA Determinations of Effect***

Conventional terms used by the NPS to measure the context, duration, intensity, and type of impact as part of NEPA analysis are not valid for assessing effects on historic properties under NHPA standards. Because the effect on a historic property is measured by the status of the historic property's eligibility for listing in the National Register, the negligible, minor, moderate, and major degrees do not apply.

Either a historic property maintains the characteristics making it eligible for listing in the National Register or it does not.

The ACHP has issued regulations for the implementation of section 106, entitled Protection of Historic Properties (36 CFR 800). ACHP regulations discuss the following types of effect:

- **No Historic Properties Affected:** When there are no historic properties present, or the action would have no effect on historic properties, the action is said to have no effect on historic properties.
- **No Adverse Effect:** Occurs when there would be an effect on a historic property, but the action would not alter characteristics that make the property eligible for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the property.
- **Adverse Effect:** Occurs when an action would alter, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Places in a way that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the action that may occur later in time, be farther removed in distance, or be cumulative.

The regulations allow an agency, such as the park, to defer both the identification of historic properties (that is, the identification of whether or not a resource is eligible for the NRHP) and the effects assessment through the development of a programmatic agreement. The agreement may also stipulate additional terms, such as consultation, reporting criteria, monitoring, and dispute resolution. Yosemite National Park's section 106 review process is governed by national and park-specific programmatic agreements among the NPS, the ACHP, and the National Council of SHPOs or the California SHPO (NPS, ACHP, and NCSHPO 2008; NPS, SHPO, and ACHP 1999). As described previously, the Park is also proposing, via consultation with the ACHP, SHPO, and Native tribes, the creation of a Merced River Plan PA regarding treatment of historic properties and other cultural resources under the proposed management plan.

Undertakings are designed to avoid adverse effects to the maximum extent possible. If complete avoidance of adverse effects is not possible, steps are taken to minimize those effects, including the implementation of mitigation measures. Data recovery does not constitute mitigation of adverse effects under the current NHPA regulations (36 CFR 800). Finally, if complete mitigation is not possible, memoranda of agreement are developed with the State Historic Preservation Officer to resolve adverse effects. Resolving and/or mitigating adverse effects in this manner does not necessarily mean that there would be no remaining adverse effects; in many cases, mitigation can result in reduced impacts.

Some assumptions are necessary in this analysis. For example, informal trails and high concentrations of visitor use have variable impacts depending on the depth and type of archeological resource on which they occur. For this analysis, informal trails and visitor use are assumed to be adverse effects. Additional monitoring and/or testing would be necessary to determine the extent of the disturbance to individual archeological resources. Another assumption is that past adverse effects to archeological resources will not be considered adverse effects under Alternative 1 (No Action). For example, the

adverse effects to the data potential of the now abandoned El Portal Wastewater Treatment Plant occurred when the structure was built in the 1960s. Alternative 1 (No Action) does not need to take responsibility for that adverse effect, but it should account for current adverse effects of the attractive nuisance and impacts to setting, feeling, and association should the structures remain in place.

### ***Environmental Consequences of Alternative 1 (No Action)***

This subsection and the following alternatives subsections summarize the effects from different types of proposed management actions (including no action) that would occur in each Merced Wild and Scenic River segment. Some actions have been determined to have no effect on archeological resources. In order to protect confidential site location data, resources are not individually named nor are their exact positions relative to the management actions revealed. The assessments are based on current site conditions, causes of current impacts, and potential for continuation or worsening of existing impacts under Alternative 1. Text below describes proposed actions and potential impacts. **Table 9-245** summarizes these proposed actions and potential impacts to archeological sites, and then offers analysis under NEPA and NHPA regulations.

#### **All River Segments**

##### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), the park would leave informal trails as they currently exist. The estimated 8 miles of existing informal trails would continue to be used, including those that cross sensitive archeological sites. This would result in continuing erosion on these sites, which exposes artifacts and makes them vulnerable to collection or displacement. Other formal and informal infrastructure on, through, or near archeological sites would remain, including abandoned underground utilities, parking areas, nonessential roads and trails, campsites, and staging areas. Access formal and informal) to climbing areas would continue to result in inappropriate use and vandalism of rock art features.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

The continued high numbers of day use and total visitors proposed under Alternative 1 (No Action) would result in ongoing impacts on archeological sites that are currently experiencing effects of high visitor use. Effects that can be correlated specifically with visitor use include creation and use of informal trails, littering, artifact collection and other vandalism, general erosion and trampling, and inappropriate use of site features such as climbing.

Ground disturbance, alterations, and removal of existing historic and modern infrastructure would have potential impacts to archeological resources. Abandoned infrastructure and ditches are often historic archeological resources in and of themselves. In Wawona, for example, historic archeological resources contribute to the cultural ORV. Avoidance and other mitigation measures developed through consultation with SHPO and traditionally associated groups would target protection of archeological resources with respect to these actions.

**TABLE 9-245: IMPACTS FROM ALTERNATIVE 1**

Segment	Action Type	Proposed Action	Analysis under NEPA/NHPA
All segments	Actions to Protect and Enhance River Values	No restoration (removing and revegetating) of informal trails; continued use of existing trails, including those that cross areas of archeological sites  Formal and informal infrastructure improvements continue as is; many areas of existing infrastructure such as campsites, roads) include relatively easy access to archeological sites, including rock art features	<i>NEPA</i> : Visitor use on informal trails and improvements to formal and informal infrastructure would result in local, long-term, minor to moderate, adverse impacts.  <i>NHPA</i> : Determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects as a result of these on-going visitor use impacts. Site specific measures would be developed to avoid adverse effects when possible.
All segments	Actions to Manage Visitor Use and Facilities	High day use and total numbers of visitors continues. Ongoing impacts on relatively accessible archeological sites continues, including: littering, artifact collection, vandalism, etc. Changes to existing infrastructure may be necessary.	<i>NEPA</i> : High levels of visitor use and possible infrastructure improvements at specific locations would result in local, long-term, minor, adverse impacts.  <i>NHPA</i> : Determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects as a result of these on-going visitor use impacts. Site specific measures would be developed to avoid adverse effects when possible.
Segment 1	Actions to Protect and Enhance River Values	No restoration of informal trails, decompaction of soils, or revegetation of heavily grazed areas would occur on or near known archeological sites.	<i>NEPA</i> : Impacts of informal trails and compromised meadow ecology would result in local, long-term, minor, adverse impacts to archeological resources.  <i>NHPA</i> : There are no NRHP listed sites, or sites determined to be NRHP eligible in Segment 1. No historic properties would be affected.
Segment 1	Actions to Manage Visitor Use and Facilities	Continued use of Merced Lake High Sierra camp	<i>NEPA</i> : Continued visitor use at Merced Lake High Sierra Camp would result in local, long-term, minor, adverse impacts.  <i>NHPA</i> : There are no NRHP listed sites, or NRHP sites determined to be eligible in Segment 1. No historic properties would be affected.
Segment 2	Actions to Protect and Enhance River Values	No decompaction of soils, revegetation of denuded areas, or removal of informal trails and abandoned infrastructure would occur. Stock use, operational staging, hiking trails, unauthorized camping, vandalism, and climbing would continue. Graffiti and climbing hardware would not be removed from rock shelters and rock art boulders.	<i>NEPA</i> : Impacts of compromised meadow ecology, visitor use, vandalism, and climbing would result in local, long-term, minor to moderate, adverse impacts to individual sites.  <i>NHPA</i> : Determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects as a result of these on-going visitor use impacts. An adverse effect on a contributing element of the Yosemite Valley Archeological District may be an adverse effect on the whole.

**TABLE 9-245: IMPACTS FROM ALTERNATIVE 1 (CONTINUED)**

Segment	Action Type	Proposed Action	Analysis under NEPA/NHPA
Segment 2	Actions to Manage Visitor Use and Facilities	Current facilities and levels of visitor use in the Valley would continue unchanged. Camping and individual lodging units would continue on and near sensitive archeological resources.	<i>NEPA:</i> Impacts of visitor use, and maintenance of facilities would result in local, long-term, minor to moderate, adverse impacts to individual sites. <i>NHPA:</i> Determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects as a result of these on-going visitor use impacts. An adverse effect on a contributing element of the Yosemite Valley Archeological District may be an adverse effect on the whole.
Segments 3 and 4	Actions to Protect and Enhance River Values	Abandoned infrastructure at the Cascades Picnic Area would not be removed. Informal trails and a nonessential gravel road would remain. Visitor use would remain at current levels.	<i>NEPA:</i> Retention of abandoned infrastructure at Cascades Picnic Area would result in no ground disturbance to archeological resources in the area. This would result in local, long-term, negligible impacts. <i>NHPA:</i> Retention of abandoned infrastructure at Cascades Picnic Area would result in no adverse effect to the contributing elements of the Merced Canyon Travel Corridor Historic District, an eligible property.
Segments 3 and 4	Actions to Manage Visitor Use and Facilities	No action further removal of infrastructure) would occur at El Portal Wastewater Treatment Plant.  Abbieville and Trailer Village area in Segment 4 would continue to be used for temporary employee or park partner housing.	<i>NEPA:</i> Retention of abandoned infrastructure at the El Portal Wastewater Treatment Plant would result in no ground disturbance to archeological resources in the area, but the attractive nuisance would remain. This would result in local, long-term, minor, adverse impacts. Impacts of residential use at Abbieville and Trailer Village would result in local, long-term, negligible, adverse impacts to archeological resources <i>NHPA:</i> Retention of abandoned infrastructure and the retention of existing employee housing and residential use at Abbieville and Trailer Village would result in an adverse effect to the contributing elements of the El Portal Archeological District.
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Informal trails in Segments 5 and 7 would remain open for use. In Segment 7, visitor and operational uses including camping) would also continue in the Wawona area.	<i>NEPA:</i> Impacts of informal trails and visitor and operational use would result in local, long-term, minor to moderate, adverse impacts to archeological resources. <i>NHPA:</i> Determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects as a result of these on-going visitor use impacts. Site specific measures would be developed to avoid adverse effects when possible. An adverse effect on a contributing element of the Wawona Archeological District may be an adverse effect on the whole.
Segments 5, 6, 7, and 8	Actions to Manage Visitor Use and Facilities	As above, with continued operation of the Wawona Campground and Wawona Stock Camp. No additional restroom and waste collection facilities would be constructed near the Wawona Swinging Bridge, resulting in continued use of a nearby archeological site for improper disposal of trash and human waste.	<i>NEPA:</i> Impacts of visitor use at Swinging Bridge, Wawona Campground, and Stock Camp would result in local, long-term, minor to moderate, adverse impacts to archeological resources. <i>NHPA:</i> Continued operation of the Wawona Campground and Stock Camp, and lack of facilities at Swinging Bridge would result in an adverse effect to the known archeological site.

### **Segment 1: Merced River above Nevada Fall**

There are no NRHP listed or archeological resources determined to be NRHP eligible in Segment 1. Under Alternative 1 No Action), no historic properties would be affected. Under NEPA, archeological sites have other potential value, other than their National Register eligibility. Even sites that do not meet National Register criteria, or that have lost most of their integrity, can still be capable of conveying past culture or history, and may therefore have value in the context of public interpretation and/or traditional cultural resources. The presence of informal trails near archeological sites, visitor use, and compromised meadow ecology create a potential for local, long-term, minor, adverse impacts.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), some of the sites in Segment 2 would continue to be adversely impacted by ongoing visitor and operational activities and formal or informal infrastructure, including trails and rock climbing routes. Decomacted soils, denuded areas, informal trails, and abandoned infrastructure would remain as they currently exist. Stock use, operational staging, hiking trails, unauthorized camping, vandalism, and climbing would continue to impact resources in the vicinity of the East Valley Campground, Ahwahnee, El Capitan, Housekeeping Camp, Yosemite Lodge, and Bridalveil/West Valley planning areas. Graffiti and climbing hardware would remain on and near rock shelters and rock art boulders. NEPA analysis would characterize these impacts as local, long-term, minor to moderate, and adverse. Under NHPA analysis, there may an adverse effect to contributing sites of the Yosemite Valley Archeological District, as well as several sites that are not contributors to the district that may be individually significant.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Current facilities and levels of visitor use in the Valley would continue unchanged under Alternative 1 (No Action). Camping and individual lodging units in Housekeeping Camp; Boys Town; Curry Village; and Lower Pines, North Pines, and Yellow Pine campgrounds would continue on and near sensitive archeological resources, resulting in local, long-term, minor to moderate, and adverse impacts (NEPA) and potentially adverse effects (NHPA) from visitor use, such as erosion of soils and consequent exposure, trampling, and collection of cultural materials. Final determination of adverse effects under NHPA requires site evaluations and specific analyses of visitor use impacts as they relate to the significant qualities of the sites.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Archeological resources in the Merced River Gorge (Segment 3) and El Portal (Segment 4) include historic-era and prehistoric sites, as well as the Merced Canyon Travel Corridor Historic District (determined eligible) and the El Portal Archeological District (listed). Under Alternative 1 No Action), abandoned infrastructure at the Cascades Picnic Area would remain as it currently exists. Informal

trails and a nonessential gravel road would remain within two sites in Old El Portal, and visitor use would remain at current levels. Local, long-term, minor, adverse impacts (NEPA) on individual archeological sites from these conditions would include increased erosion and trampling, soil compaction, and opportunities for unauthorized artifact collection. Under NPHA analysis, there may be an adverse effect to contributing sites of the El Portal Archeological District, and no adverse effect to the Merced Canyon Travel Corridor Historic District.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 1 (No Action), the Abbeville and Trailer Village area in Segment 4 would continue to be used for temporary employee or park partner housing. The abandoned El Portal Wastewater Treatment Plant would remain as it is. These ongoing impacts generally include erosion, creation of informal trails, and unauthorized artifact collection or displacement. Under NEPA, these impacts would be characterized as local, long-term, minor, adverse impact from trampling and potential artifact collection or displacement. Under NHPA, there may be adverse effects to contributing resources to the El Portal Archeological District at Abbeville and Trailer Village.

**Segments 5, 6, 7, and 8: South Fork Merced River**

***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 1 (No Action), informal trails and charcoal rings in Segment 5 would remain, continuing surface and subsurface disturbance of archeological resources. In Segment 7, visitor and operational uses, as well as informal trails, would continue in the Wawona Store area. Camping in the Wawona Campground would continue to result in ongoing adverse impacts on shallow subsurface deposits within historic-era sites. Informal trails would continue to be used through sites near the South Fork and Wawona Store picnic areas. The Wawona Hotel would continue to be used, resulting in ground disturbing impacts to surface and sub-surface archeological resources from construction, maintenance, and use of structures and infrastructure; foot traffic; and landscaping. Under NEPA, impacts would be long-term, minor to moderate, and adverse. Under NHPA analysis, there is an adverse effect to contributing sites of the Wawona Archeological District. It is unlikely that the sum of these conditions would affect eligibility of Wawona Archeological District as a whole.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 1 (No Action), no additional restroom and waste collection facilities would be constructed near the Wawona Swinging Bridge, resulting in continued use of a nearby archeological site for improper disposal of trash and human waste, considered to be an adverse impact. Also anticipated under Alternative 1 would be ongoing impacts to archeological resources from continued operation of the Wawona Campground. Under NEPA, impacts would be local, long-term, minor to moderate, and adverse. Under NHPA analysis, there is an adverse effect to the known archeological site.

### **Summary of Impacts from Alternative 1 (No Action)**

Under Alternative 1 (No Action), there would be no change in the treatment and management of archeological resources. Local, long-term, negligible to moderate adverse impacts on archeological resources would occur as a result of ongoing park operations and programs, such as facilities maintenance and repair, as well as ongoing visitor use. Specifically, the creation and ongoing use of informal and formal trails leading through or adjacent to archeological sites; use of site areas for parking, staging, storage, or stock use; rock climbing routes or bouldering activities that traverse rock shelter and rock art features; and informal camping within sensitive sites all currently result in localized, minor to moderate, adverse effects on archeological resources, and would continue to do so under Alternative 1. Under NHPA analysis, these impacts would or may lead to adverse effects to individual archeological sites which are contributors to the Yosemite Valley Archeological District, the Merced River Travel Corridor Historic District, the El Portal Archeological District, and the Wawona Archeological District. It is unlikely that the sum of these conditions would affect eligibility of larger archeological districts.

### **Cumulative Impacts of Alternative 1 (No Action)**

Cumulative impacts on archeological resources are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of Alternative 1 (No Action). The projects identified below include only those projects that could affect archeological resources within the Merced River corridor.

#### ***Past Actions***

Archeological resources are subject to damage from land use, visitor access, and natural processes. Appendix B contains the list of past actions that have resulted in cumulative impacts on environmental resources, including archeological sites in some areas. Construction and maintenance of facilities within the river corridor has disturbed or destroyed numerous archeological resources and compromised the integrity of numerous other such resources. Adverse effects have occurred to archeological historic properties, but they still retain their integrity as historic properties.

#### ***Present Actions***

There are a number of archeological resource sites in the Merced River corridor at, or adjacent to trails, structures, utility systems, and other facilities and are subject to ongoing disturbances such as trampling, unauthorized collection, and ground disturbance associated with facility maintenance. Any present projects that would result in ground disturbance and/or excavation (trail/road improvements, new facility or infrastructure construction and maintenance, restoration) have the potential to result in adverse impacts (NEPA) and create an adverse effect (NHPA) on known or unknown archeological resources. Under the current, 1999 programmatic agreement with the ACHP, all present actions are reviewed for compliance with section 106 of the NHPA, and adverse effects are avoided or mitigated to the extent possible. Current projects that could result in beneficial impacts through increased knowledge of impacts and recommendation and implementation of protection measures include the 2009 *Yosemite Fire Management Plan*, *Visitor Use and Impacts Monitoring Plan*, and the *Scenic Vista Management Plan*.



### ***Reasonably Foreseeable Future Actions***

Visitation to Yosemite is anticipated to increase at a rate of 3% annually, which would increase the risk of potential adverse impacts on archeological resources. Any future projects that would result in ground disturbance and/or excavation have the potential to result in adverse impacts on known or unknown archeological resources. The *Yosemite Wilderness Stewardship Plan* could potentially result in beneficial impacts to further protection of archeological resources in Segments 1 and 5. Future park operational actions would be subject to site-specific planning and compliance and be undertaken in accordance with stipulations in the servicewide 2008 programmatic agreement. Every effort would be made during the design phase to avoid adverse impacts and adverse effects.

### ***Overall Cumulative Impacts of Alternative 1 (No Action)***

Alternative 1 (No Action), in consideration with past, present and future actions, would result in no change in the current treatment and management of archeological resources. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in existing and future programmatic agreements; several sites would continue to undergo adverse impacts not related to any specific action. Under NHPA, there are existing cumulative adverse effects on individual archeological resources, and Alternative 1 would contribute to these adverse effects.

## ***Environmental Consequences of Actions Common to Alternatives 2–6***

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Proposed actions that could affect archeological resources under Alternatives 2–6 would include protection and revegetation of sensitive riparian habitats, stabilization and protection of riverbanks, removal of abandoned infrastructure, restoration of meadows, and restoration (removal and revegetating) of informal trails. In some areas, these actions would result in disturbances to the surface and subsurface within and adjacent to known archeological sites. In other areas, there is a potential for these activities to uncover unrecorded archeological sites, including those with no surface visibility.

**Table 9-246** summarizes these proposed actions and potential impacts to archeological sites, and then offers analysis under NEPA and NHPA regulations.

Restoration of informal trails that encroach onto archeological sites would reduce visitor activities on archeological resources that may include unauthorized collection and potential displacement of artifacts, either inadvertently or through vandalism. Decompaction of soils and planting of native vegetation on denuded areas could adversely impact the vertical and horizontal contexts (stratigraphy) within these areas.

For the most part, removal of young conifers from meadows, restoration of hydrologic processes, and renewed use of low-intensity fire to restore meadows would not affect any known archeological resources, nor would the removal of riprap; incorporation of large woody debris or engineered logjams; and subsequent actions to revegetate, protect, and stabilize riparian areas and eroded riverbanks. Several

**TABLE 9-246: IMPACTS FROM ACTIONS COMMON TO ALTERNATIVES 2–6**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>			
All segments	Actions to Protect and Enhance River Values	<p>Protection and revegetation of sensitive riparian habitats</p> <p>Removal of abandoned infrastructure, restoration of meadows</p> <p>Restoration of informal trails</p> <p>Abandoned underground infrastructure removal projects would be subject to review under section 106 on an individual basis</p> <p>Archeological site locations would be considered and avoided whenever possible</p>	<p><i>NEPA</i>: Impacts to specific sites are local; duration and type of impacts vary.</p> <p>For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.</p> <p>Activities that direct visitor activities away from archeological resources result in local to segmentwide, long-term minor to moderate beneficial impacts.</p> <p>Restoration activities and removal of abandoned infrastructure on or near archeological sites would result in local, long-term, minor to moderate adverse impacts.</p> <p><i>NHPA</i>: Site specific measures would be developed to avoid adverse effects when possible. Avoidance of significant archeological sites will occur when possible. When it is not, determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects when actions occur on or near archeological sites.</p>
<b>Hydrologic/Geologic Resource Actions</b>			
All segments	Actions to Protect and Enhance River Values	Stabilization and protection of riverbanks	<p><i>NEPA</i>: For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.</p> <p>Stabilization activities near or on archeological sites would result in local, long-term, minor to moderate adverse impacts.</p> <p><i>NHPA</i>: Site specific measures would be developed to avoid adverse effects when possible. Avoidance of significant archeological sites will occur when possible. When it is not, determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects.</p>
<b>Cultural Resource Actions</b>			
All segments	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	General reduction in focused visitor use at areas on or near known archeological resources	<p><i>NEPA</i>: Activities that direct visitor activities away from archeological resources result in local to segmentwide, long-term minor to moderate beneficial impacts.</p> <p><i>NHPA</i>: no historic properties are affected</p>

**TABLE 9-246: IMPACTS FROM ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Programmatic Actions</b>			
All segments	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Various facilities would be removed, repurposed, or reduced  Archeological site locations would be considered and avoided whenever possible	<i>NEPA:</i> Impacts to specific sites are local; duration and type of impacts vary.  For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.  Activities that involve ground disturbance on or near archeological sites would result in local, long-term, minor to moderate adverse impacts.  <i>NHPA:</i> Site specific measures would be developed to avoid adverse effects when possible. When avoidance of archeological sites is not possible, determination of effects is site specific. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects when actions occur on or near archeological sites.
<b>Biological Resource Actions</b>			
Segment 1	Actions to Protect and Enhance River Values	Sections of established trails would be rerouted out of sensitive habitats such as meadows and wetlands  Boardwalks or fencing would be used as needed to prevent trail widening and elevate trails above wet areas  Archeological site locations would be considered and avoided whenever possible	<i>NEPA:</i> Activities that direct visitor activities away from archeological resources result in local to segmentwide, long-term minor to moderate beneficial impacts.  Activities that involve ground disturbance on or near archeological sites would result in local, long-term, minor to moderate adverse impacts.  <i>NHPA:</i> There are not NRHP listed or NRHP eligible sites in Segment 1. No historic properties would be affected.
Segment 1	Manage Visitor Use and Facilities	No common actions to manage visitor use and facilities to Alternatives 2–6.	N/A
Segment 2	Actions to Protect and Enhance River Values	Restore meadows  Remove abandoned infrastructure and facilities within 100 feet of the riverbanks  Relocate, delineate, or restore trail segments that cross sensitive habitat areas or have fallen into disrepair  Archeological site locations would be considered and avoided when possible	<i>NEPA:</i> Impacts to specific sites are local; duration and type of impacts vary.  For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.  Activities that involve ground disturbance on or near archeological sites would result in local, long-term, minor to moderate adverse impacts.  <i>NHPA:</i> Site specific measures would be developed to avoid adverse effects when possible. When avoidance of archeological sites is not possible, determination of effects is site specific. An adverse effect on a contributing element of the Yosemite Valley Archeological District is an adverse effect on the whole. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects when actions occur on or near archeological sites.

**TABLE 9-246: IMPACTS FROM ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Cultural Resource Actions</b>			
Segment 2	Actions to Protect and Enhance River Values	Protect archeological sites through rerouting and redirection of visitor activity	<p><i>NEPA:</i> Activities that direct visitor activities away from archeological resources result in local to segmentwide, long-term minor to moderate beneficial impacts.</p> <p><i>NHPA:</i> no historic properties are affected</p>
<b>Hydrologic/Geologic Resource Actions</b>			
Segment 2	Actions to Protect and Enhance River Values	<p>Improve the free-flowing condition of the river</p> <p>Refocus visitor use to resilient areas; and relocate, delineate, or restore trail segments that cross sensitive habitat areas or have fallen into disrepair</p> <p>Archeological site locations would be considered and avoided when possible</p>	<p><i>NEPA:</i> Impacts to specific sites are local; duration and type of impacts vary.</p> <p>For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.</p> <p>Activities that involve ground disturbance on or near archeological sites would result in local, long-term, minor to moderate adverse impacts.</p> <p><i>NHPA:</i> Site specific measures would be developed to avoid adverse effects when possible. When avoidance of archeological sites is not possible, determination of effects is site specific. An adverse effect on a contributing element of the Yosemite Valley Archeological District may be an adverse effect on the whole. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects when actions occur on or near archeological sites.</p>
<b>Programmatic Resource Action</b>			
Segment 2	Actions to Manage Visitor Use and Facilities	<p>Various facilities in Segment 2 would be removed, repurposed, or reduced</p> <p>New parking spaces would be provided in several locations, existing parking lots would be formalized, and one new shuttle bus stop would be constructed</p> <p>Specific areas: expansion of Camp 4 (Sunnyside Campground) and Backpackers area</p> <p>Improvements to visitor facilities at Bridalveil Fall</p> <p>Construction of new parking lots and expansion of existing lots</p> <p>Removal of Valley Garage Service and relocation to Government Utility Building</p>	<p><i>NEPA:</i> Impacts to specific sites are local; duration and type of impacts vary.</p> <p>For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.</p> <p>Activities that involve ground disturbance on or near archeological sites would result in local, long-term, minor to moderate adverse impacts.</p> <p><i>NHPA:</i> Site specific measures would be developed to avoid adverse effects when possible. When avoidance of archeological sites is not possible, determination of effects is site specific. An adverse effect on a contributing element of the Yosemite Valley Archeological District may an adverse effect on the whole. Re-evaluation of integrity of NRHP-listed and eligible properties would be necessary to determine if there are adverse effects when actions occur on or near archeological sites.</p>

**TABLE 9-246: IMPACTS FROM ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Programmatic Resource Action (cont.)</b>			
Segment cont.)		<p>Expansion of Camp 6 parking into previous footprint of Valley Garage area</p> <p>Construction of two-bay roads and trails maintenance building in proximity to the Government Utility Building</p> <p>Retain existing facilities and services of Ahwahnee Hotel, but remove pool and tennis courts associated with Hotel</p> <p>Remove old and temporary housing at Highland Court and the Thousand Cabins in the Yosemite Lodge area and replace with new housing</p> <p>Retain Yosemite Lodge maintenance and housekeeping</p> <p>Remove NPS Volunteer Office former Wellness Center), post office, swimming pool, and snack stand in Yosemite Lodge area</p> <p>Remove Concessioner General Office in Yosemite Village (use infill into other existing buildings)</p> <p>Archeological site locations would be considered and avoided when possible</p>	
<b>Scenic Resource Actions</b>			
Segments 3 and 4	Actions to Protect and Enhance River Values	<p>Removal of conifers from the Cascade Fall viewpoint</p> <p>Archeological site locations would be considered and avoided when possible</p>	<p><i>NEPA:</i> For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.</p> <p>Activities that involve ground disturbance in areas of known archeological sites would result in local, long-term, minor to moderate adverse impacts.</p> <p><i>NHPA:</i> When avoidance of archeological sites is not possible, determination of effects is site specific.</p>

**TABLE 9-246: IMPACTS FROM ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Actions</b>			
Segments 3 and 4	Actions to Protect and Enhance River Values	<p>Removal of abandoned infrastructure from the Cascades Picnic Area and El Portal Wastewater Treatment Plant</p> <p>Remove informal trails and a nonessential road from two locations in El Portal</p> <p>Remove asphalt and imported fill from within the Abbeville and Trailer Village area.</p>	<p><i>NEPA:</i> For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.</p> <p>Activities that involve ground disturbance in areas of known archeological sites would result in local, long-term, minor to moderate adverse impacts.</p> <p><i>NHPA:</i> When avoidance of archeological sites is not possible, determination of effects is site specific.</p> <p>Activities that remove infrastructure at Cascades Picnic Area (itself an archeological site) would result in an adverse effect to the contributing elements of the Merced Canyon Travel Corridor Historic District, an eligible property.</p>
<b>Programmatic Resource Actions</b>			
Segments 3 and 4	Actions to Manage Visitor Use and Facilities	<p>Temporary housing units would be moved from Yosemite Valley to El Portal</p> <p>Archeological sites would be considered in planning and avoided whenever possible</p>	<p><i>NEPA:</i> For areas where proposed actions do not occur on or near known archeological sites, there would be a negligible impact on archeological properties.</p> <p>Potential site-specific impacts from the relocation of housing units would result from ground-disturbing activities and concentration of uses in areas sensitive for archeological sites. Impacts are local, long-term, minor to moderate adverse impacts, including contributing sites of the El Portal Archeological District.</p> <p><i>NHPA:</i> When avoidance of archeological sites is not possible, determination of effects is site specific.</p>
<b>Cultural Resource Actions</b>			
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Design several actions to reduce or halt ongoing adverse impacts on known archeological sites through wilderness and developed camping, use of informal trails, and informal off-road vehicle travel and parking	<p><i>NEPA:</i> Activities that direct visitor activities away from archeological resources result in local to segmentwide, long-term minor to moderate beneficial impacts.</p> <p><i>NHPA:</i> no historic properties are affected, including contributing elements of the Wawona Archeological District.</p>

**TABLE 9-246: IMPACTS FROM ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Cultural Resource Actions (cont.)</b>			
Segments 5, 6, 7, and 8 (cont.)		Removal or relocation of Wawona Campground campsites and a road segment out of known archeological resources  Development of a site management plan including restrictions on off-road and shoulder travel and parking in the vicinity of a known archeological site	
<b>Programmatic Resource Actions</b>			
Segment 7	Actions to Manage Visitor Use and Facilities	Replacement of current restroom facilities at the Wawona Store  Construction of new formal river access and visitor amenities, such as restrooms and waste disposal, near the Wawona Swinging Bridge area	<i>NEPA:</i> The current Wawona public restrooms are within a multicomponent archeological site. Replacement of the existing facilities with larger restrooms could impact this site, if previously undisturbed site soils are excavated during construction of the new restrooms. Adverse Impacts are local, long-term, minor to moderate.  Providing formalized river access and visitor amenities such as restrooms, parking, and waste disposal outside archeological site boundaries near the Wawona Swinging Bridge could have a long-term, beneficial impact.  <i>NHPA:</i> As both actions are within or near known archeological sites, there is an adverse effect.

archeological sites are adjacent to the river, and would be vulnerable to actions taken along the river banks. Removing ground-obscuring vegetation and shallow soil disturbances could lead to inadvertent discovery of unrecorded archeological resources. Additionally, impacts could occur during operation of heavy machinery on or near known or unknown resources that contain shallow cultural deposits, including during transit from a staging area or maintenance yard to the location of the management action. Dragging large logs or felled trees across the surface of a site could have similar effects. While inadvertent discovery of an unrecorded site is not necessarily an impact in and of itself, it can result in exposure of artifacts and other cultural materials to erosion, loss of stratigraphic information, trampling, vandalism, and collection. Mitigation measure MM-AR-1 (see Appendix C) describes the park's process of worker education, artifact recognition, resource evaluation, and development of a treatment plan to reduce or avoid the potential impacts related to inadvertent discovery.

Ground disturbances associated with actions proposed for areas within or immediately adjacent to the known boundaries of an archeological resource can result in loss of stratigraphic information and displacement of artifacts, when avoidance is not possible. Mitigation measure MM-AR-2 (see Appendix C) describes the process the park would follow to assess the presence of surface and subsurface archeological materials, and the subsequent steps to avoid or mitigate impacts from the proposed action. Mitigation measure MM-AR-3 (archeological monitoring, see Appendix C), would also be employed as appropriate either in conjunction with MM-AR-2 or as an alternative to testing in areas where management actions would result in very minor ground disturbances. With implementation of these three mitigation measures, adverse impacts and effects on archeological resources from the proposed actions to protect and enhance river values would be reduced.

Because abandoned underground infrastructure removal projects would be subject to review under section 106 of the NHPA on an individual basis, impacts on archeological resources would be addressed on a case by case basis as part of planning, design, and implementation.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternatives 2–6, various facilities would be removed, repurposed, or reduced. These facilities range from those related to recreational activities (swimming, ice skating, tennis, rafting, and cycling) to retail, housing, and campsites. While a general reduction in focused visitor use at areas on or near known archeological resources would result in a reduction of ongoing minor impacts from trampling, erosion, inappropriate uses, and artifact collection or vandalism, the act of removing or renovating the facilities could disturb subsurface deposits of cultural materials.

Intact subsurface cultural deposits and individual artifacts could still exist in certain areas. Implementation of mitigation measure MM-AR-2 (see Appendix C) would ensure that through a process of testing, action modification, and potential data recovery, the potential for adverse effects from actions to manage visitor use and facilities would be reduced or avoided. Inadvertent discovery of unknown resources is unlikely, given the amount of ground disturbance that occurred during initial construction of the facilities.



## **Segment 1: Merced River above Nevada Fall**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, various sections of established trails would be rerouted out of sensitive habitats such as meadows and wetlands in Segment 1. Boardwalks or fencing would be used as needed to prevent trail widening and elevate trails above wet areas.

Although most existing trails are not known to cross any sensitive archeological resources, rerouting some trails could result in disturbance of some known sites, and the inadvertent discovery of previously unknown resources. Subsurface disturbances associated with trail construction could result in displacement of artifacts, disruption of stratigraphic information, and exposure of sensitive site areas to erosion, when avoidance is not possible. Under NEPA, these adverse impacts would generally occur only during trail construction, and are local, long-term, and minor to moderate in nature. Under NHPA, there are no NRHP listed, or sites determined to be eligible for the NRHP in Segment 1; no historic properties are affected.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, actions would be taken in Segment 2 to restore meadows; improve the free-flowing condition of the river; protect archeological sites; remove abandoned infrastructure and facilities within 100 feet of the riverbanks; refocus visitor use to resilient areas; and relocate, delineate, or restore trail segments that cross sensitive habitat areas or have fallen into disrepair.

Meadow restoration would include actions to improve hydrologic function, restore native vegetation, and remove inappropriate uses or facilities. Some of the specific actions that could affect archeological resources include filling ditches using heavy equipment, removing encroaching conifers, relocating and/or elevating trails onto boardwalks, revegetation with willows and other native species, removing abandoned infrastructure, removing and restoration of informal trails and parking areas, decompacting soils, improving road crossings of meadows, and using low-level fire regimes to maintain healthy meadow ecosystems. Each of these actions would result in ground disturbance that could affect surface or shallow subsurface cultural materials, including those associated with the Yosemite Valley Archeological District. Activities associated with these actions (e.g., mechanical decompaction of soil) could expose artifacts to erosion and disturb the integrity of horizontal and vertical site patterning. Similarly, removing abandoned infrastructure, decompacting soils in former parking areas or roads, removing encroaching conifers, preparing areas for revegetation, constructing improvements at road crossings, and rerouting trails could involve the use of heavy equipment on known sites, which could disturb buried or surface cultural materials. Use of fire to keep meadows open and ecologically productive could temporarily expose artifacts on the ground surface, making them vulnerable to collection or dislocation.

Actions to improve the free-flowing condition of the river would include installation of engineered logjams and large woody debris, brush layering, and removal of abandoned bridge footings and gaging

station infrastructure. These actions would generally occur within the river and for the most part (except those sites adjacent to the river) would not directly affect any known archeological sites. Operation of heavy machinery on archeological resources, including during transit from a staging area or maintenance yard to the location of the management action, could affect known resources that contain shallow cultural deposits, as would dragging large logs across the surface of a site.

Removal of abandoned infrastructure is proposed under Alternatives 2–6 for several locations in Segment 2. Actions associated with infrastructure removal would include removing artificial fill and decompacting soils, recontouring the ground surface, and revegetating the area with native plant species. Some of the infrastructure removal actions are proposed for areas within the boundaries of known archeological sites. While these resources were likely adversely affected by original construction of the infrastructure to be removed, it is possible that intact deposits of subsurface cultural materials may still exist. Ground-disturbing actions associated with the removal of abandoned infrastructure could result in an adverse impact for those actions proposed within known sites.

Several management actions under Alternatives 2–6 would be undertaken specifically to protect archeological sites from further damage resulting from visitor use and infrastructure impacts. These actions include removing/limiting or rerouting formal roads and trails away from sensitive areas, removing and revegetating informal trails and parking turn-outs, removing unauthorized campfire rings and campsite furniture logs, removing climbing hardware from rock features, removing graffiti, and increasing law enforcement and/or archeological monitoring at sites known to attract unauthorized camping and climbing. The park would develop increased awareness and outreach programs to educate climbers about irreplaceable cultural resources and institute prohibitions on climbing at some locations. Sensitive features in high-use areas may be fenced off to prevent access, and some formal campsites and bear boxes would be removed from within site boundaries.

Proposed redirection of visitor uses to resilient areas away from unstable slopes and sensitive locations along riverbanks, and the associated restoration of eroded and denuded areas in Segment 2 would generally lessen impacts to archeological resources. Some of the proposed actions under Alternatives 2–6 would take place close to known archeological sites. These sites would be considered in planning for fencing of sensitive areas to exclude visitor access. Revegetation activities themselves might result in impacts such as artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity.

Portions of hiking and stock trails in Segment 2 would be removed, relocated, reconstructed, or better delineated to focus visitor use on well-established trails that do not cross sensitive habitats or cultural sites. Removed portions of trails would be decompacted and revegetated, and new trail construction or fencing would be beyond the boundaries of known sites, whenever possible. Ground disturbances from soil decompaction, operation of heavy equipment, and preparation for revegetation could affect known archeological resources in the vicinity of each action.

Ground disturbances associated with actions proposed for areas within or immediately adjacent to the known boundaries of an archeological resource can result in loss of stratigraphic information and displacement of artifacts. Mitigation measure MM- AIR-2 (see Appendix C) describes the process the park would follow to assess the presence of surface and subsurface archeological materials, and the

subsequent steps to avoid or mitigate adverse effects from the proposed action. Mitigation measure MM-AR-3 (archeological monitoring, see Appendix C) would also be employed as appropriate either in conjunction with MM-AR-2 or as an alternative to testing in areas where management actions would result in very minor ground disturbances.

While inadvertent discovery of an unrecorded site is not necessarily an impact in and of itself, it can result in exposure of artifacts and other cultural materials to erosion, loss of stratigraphic information, trampling, vandalism, and collection, when avoidance is not possible. Mitigation measure MM-AR-1 (see Appendix C) describes the park's process of worker education, artifact recognition, resource evaluation, and development of a treatment plan to mitigate the potential impacts related to inadvertent discovery. With the implementation of these three mitigation measures, under NHPA, the potential for adverse effects on archeological resources from these proposed actions under Alternatives 2–6 to protect and enhance river values in Segment 2 would be reduced.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternatives 2–6, various facilities in Segment 2 would be removed, repurposed, or reduced. These facilities range from those related to recreational activities (swimming, ice skating, tennis, rafting, and cycling) to retail and other visitor services, housing, and campsites. Construction of new employee housing would add 210 beds in dormitory-style buildings, and expansion of an existing campground would add a net 51 new campsites, while some campsites and other campground facilities such as roads would be removed from a rockfall hazard zone and the bed and banks of the Merced River. New parking spaces would be provided in several locations, existing parking lots would be formalized, and one new shuttle bus stop would be constructed.

In many instances, initial construction of the facilities resulted in disturbances to archeological resources, when avoidance is not possible. Despite these previous disturbances, intact subsurface cultural deposits and individual artifacts could still exist in certain areas. Implementation of Mitigation measure MM-AR-2 (see Appendix C) would ensure that through a process of testing, action modification, and potential data recovery, the potential for adverse effects from actions to manage visitor use and facilities would be reduced. Inadvertent discovery of unknown resources is unlikely, given the amount of ground disturbance that occurred during initial construction of the facilities.

For proposed construction of new facilities or renovation of existing facilities for new uses under Alternatives 2–6, impacts could involve ground-disturbance, and have the potential to cause adverse effects to archeological resources. Planning for new construction would take into account the locations of known sensitive archeological sites in Segment 2. Mitigation measure MM-AR-1 (see Appendix C) describes the process by which the park would manage inadvertent discoveries to avoid or minimize impacts. Implementation of MM-AR-2 would also be applicable in some instances where proposed new construction or renovation would be located in or near a known site. With implementation of these measures, the potential for adverse effects from actions related to management of visitor use and facilities would be reduced.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternatives 2–6, actions to protect and enhance river values would include the removal of abandoned infrastructure from the Cascades Picnic Area (itself an archeological site) and removal of conifers from the Cascade Fall viewpoint. The park would remove informal trails and a nonessential road from two locations in El Portal as well as asphalt and imported fill from within the Abbeville and Trailer Village area. Each of these actions would occur within or adjacent to the location of a known archeological resource, and each has the potential to affect those sites.

Given this, proposed removal actions could result in impacts due to artifact displacement and temporary exposure of soils to erosion, when avoidance is not possible. Mitigation measure MM-AR-2 (see Appendix C) is recommended to reduce potential effects. Monitoring of all removal processes, as described in Appendix C for mitigation measure MM-AR-3, could help to ensure that no intact cultural deposits would be disturbed. With implementation of these measures, the potential for adverse effects from the proposed actions to protect and enhance river values would be reduced.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternatives 2–6, 32 temporary housing units would be moved from Yosemite Valley to El Portal (Segment 4). Both of the proposed locations in El Portal are within or near one or more known archeological sites. Construction of housing units on or adjacent to archeological sites would likely have direct and indirect adverse effects. Mitigation measure MM-AR-2 (see Appendix C) describes a process for assessing surface and subsurface site conditions, and development of a treatment plan to reduce potential impacts.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

In these segments, the park would design several actions to reduce or halt ongoing adverse impacts on known archeological sites through wilderness and developed camping, use of informal trails, and informal off-road vehicle travel and parking. Development of a site management plan for a specific multicomponent site, including restrictions on off-road and shoulder travel and parking in the vicinity of the site, would provide for long-term site study and preservation.

Minor adverse effects on known sites from ground-disturbing activities associated with actions to protect and enhance river values under Alternatives 2–6 would be mitigated by implementation of mitigation measure MM-AR-2, which outlines a process for treatment of sites according to each proposed action. Implementation of this measure would reduce impacts.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Proposed actions to manage visitor use and facilities include replacement of current restroom facilities at the Wawona Store with larger facilities, and construction of new restrooms and other visitor

amenities at the Wawona Swinging Bridge area. Both of these actions under Alternatives 2–6 would take place within or near known archeological resources. Construction activities on or near archeological sites would likely have direct and indirect adverse effects. Implementation of mitigation measure MM-AR-2 (see Appendix C) would reduce the potential for adverse effects.

The Wawona Swinging Bridge area is also located adjacent to a known prehistoric archeological site, which is frequently used by visitors for improper disposal of human waste. Under Alternatives 2–6, providing formalized river access and visitor amenities such as restrooms, parking, and waste disposal would intend to redirect visitor use outside of the archeological site boundaries.

### **Summary of Impacts Common to Alternatives 2–6**

A portion of the management actions proposed for Alternatives 2–6 would have the potential to result in site-specific to local, minor to major, adverse impacts (NEPA) and adverse effects (NHPA) on known prehistoric and historic-era archeological resources through ground-disturbing actions related to restoration, construction, and facilities removal, when avoidance is not possible. These could result in short-term exposure of site soils to erosional forces, displacement of artifacts, and diminished integrity of horizontal and vertical site patterning. Mitigation measure MM-AR-2 (see Appendix C) would delineate the process by which a site could be tested and characterized and an appropriate treatment plan developed. Mitigation measure MM-AR-3 would provide for an archeological monitor to be present for minimally invasive construction and restoration ground-disturbing activities within sites. Under NHPA, these measures would help to avoid, minimize, or reduce potential adverse effects associated with the proposed actions.

Other management actions under Alternatives 2–6 would include ground-disturbing activities in areas that do not contain documented archeological resources, but where such resources may be present in a buried context. Although inadvertent discovery of a previously unknown resource is not an adverse effect in and of itself, such effects can result if project personnel do not act to protect the newly discovered resource from further ground-disturbing activities, vandalism, and inappropriate use. Mitigation measure MM-AR-1 (see Appendix C) describes the process by which any unanticipated discoveries would be handled so as to minimize disturbances to previously unknown sites.

On NEPA, a portion of the management actions associated with Alternatives 2–6 would result in long-term, beneficial impacts on known archeological sites, either through restrictions on types of visitor use that can cause damage to sites (such as rock climbing or camping), restoration of areas that have been the focus of inappropriate use (such as informal trails, campfire circles, or graffiti), or stabilization of site surfaces through revegetation and other restorative actions. In some instances, actions that may ultimately benefit a resource also have the potential to adversely affect site elements if done in an inappropriate or careless manner. Mitigation recommendations have been included in the impact discussion in Appendix C as appropriate.

In areas of known sites, intensity of impacts on archeological resources relates to the importance of the information they contain and the extent of disturbance or degradation. Even the disturbance of a small portion of a rare or unstudied site type impacts to less than 10% of the total site area) can be considered an adverse effect to a site's integrity. Conversely, impacts to 25% or more of the site area of

a well-known and common site type may be considered not adverse. As above, implementation of mitigation measures would reduce or avoid effects.

### ***Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

#### **All River Segments**

Table 9-247 summarizes proposed actions under Alternative 2, and potential impacts to archeological sites, and then offers analysis under NEPA and NHPA regulations.

#### **Segment 1: Merced River above Nevada Fall**

##### ***Impacts of Actions to Protect and Enhance River Values***

None of the proposed Alternative 2 actions to protect and enhance river values, other than those actions common to Alternatives 2–6, would have the potential to affect archeological resources.

##### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Several actions related to management of visitor use and facilities under Alternative 2 would have the potential to affect archeological resources in Segment 1. These actions would include removing infrastructure at Little Yosemite Valley Backpackers Campground and converting this campground to dispersed camping; closing the Merced Lake High Sierra Camp, removing infrastructure, and redesignating portions of the area as Wilderness; and expanding Merced Lake Backpackers designated camping into other portions of the former Merced Lake High Sierra Camp. Limits on the number of hikers between Little Yosemite Valley and Merced Lake would also be enacted through a pass or wilderness trailhead quota system.

Little Yosemite Valley Campground is largely within a known prehistoric archeological site. Removing infrastructure here would reduce the number of visitors and disperse visitor activities, lessening erosion and trampling.

The Merced Lake High Sierra Camp is partially within a known prehistoric archeological site. Proposed actions include closure of the camp, removal of infrastructure, and restoration of portions of the area to a natural condition. These actions would remove some sources of concentrated visitor-use disturbances. A portion of the area would be used for an expansion of the Merced Lake Backpackers Campground.

The trail between Little Yosemite Valley and Merced Lake crosses within or near the known boundaries of several archeological sites. Limiting pedestrian traffic on this trail through a zone pass or quota system (25 daily limit) would reduce the potential for impacts on these sites from trampling, erosion, vandalism, or artifact collection.

**TABLE 9-247: IMPACTS FROM ALTERNATIVE 2 ACTIONS**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
All segments	Actions to Protect and Enhance River Values	None of the overall actions to protect and enhance river values in all river segments would affect archeological resources beyond those actions common to Alternatives 2–6.	Discussed in table 9-246: Impacts from Actions Common to Alternatives 2–6
All segments	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	None of the overall actions in any of the river segments to manage visitor use and facilities would affect archeological resources beyond except those actions common to Alternatives 2–6.	Discussed in table 9-246: Impacts from Actions Common to Alternatives 2–6
Segment 1	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segment 1 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-246: Impacts from Actions Common to Alternatives 2–6
<b>Biological Resource Action</b>			
Segment 1	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Remove infrastructure at Little Yosemite Valley Backpackers Campground and converting this campground to dispersed camping</p> <p>Close the Merced Lake High Sierra Camp, removing infrastructure, and redesignate portions of the area as Wilderness</p> <p>Expand Merced Lake Backpackers designated camping into other portions of the former Merced Lake High Sierra Camp</p> <p>Limit number of hikers between Little Yosemite Valley and Merced Lake</p> <p>Archeological sites would be considered in planning and avoided whenever possible</p>	<p><i>NEPA:</i> Proposed conversion of the existing 150-site Little Yosemite Valley Campground to dispersed camping and associated removal of infrastructure would potentially result in a site-specific, long-term beneficial impact on the known archeological site found within the Campground area, assuming avoidance is possible. Closure of the Merced Lake High Sierra Camp partially within a known prehistoric site) and limiting pedestrian traffic on the trail between Little Yosemite Valley and Merced Lake portions of which are within or near archeological sites) would have a similar site-specific, long-term beneficial impact. Proposed expansion of the Merced Lake Backpackers Campground is proposed in an area without archeological sites; there would be a negligible impact on archeological properties.</p> <p>Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity, in cases where avoidance is not possible.</p> <p><i>NHPA:</i> There are not NRHP listed or sites determined to be eligible for the NRHP in Segment 1. No historic properties would be affected.</p>
Segment 2	Actions to Protect and Enhance River Values	<p>Restore portions of Stoneman Meadow</p> <p>Remove portions of Southside Drive and the Curry Orchard parking lot</p>	<p><i>NEPA:</i> In areas where no archeological resources have been recorded (Stoneman Meadow, Curry Orchard parking Lot, Boys Town housing area, Village Store, Ahwanee Meadow), there would be a negligible impact on archeological properties.</p>

**TABLE 9-247: IMPACTS FROM ALTERNATIVE 2 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Action (cont.)</b>			
Segment 2 (cont.)		<p>Conduct several habitat restoration actions within the East Valley campgrounds</p> <p>Reroute portions of the Valley Loop Trail out of the meadow</p> <p>Remove housing and other constructions between Village Store and Ahwahnee Meadow; restore and revegetate this area</p> <p>Remove facilities and infrastructure, restoration of floodplain and riparian habitat, and conversion of the area into day use river access and picnicking in Housekeeping Camp</p> <p>Archeological sites would be considered in planning and avoided whenever possible</p>	<p>While site avoidance is always preferable, proposed removal of campsites and associated infrastructure within the East Valley campgrounds would potentially result in local, minor to moderate long-term beneficial impact on known archeological sites found within the campgrounds. Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity.</p> <p>Ground disturbance and rerouting of the Valley Loop Trail would result in a long-term moderate to major adverse effect, as this trail is itself an historic property.</p> <p><i>NHPA</i>: Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific, when avoidance is not possible. Mitigation may reduce the adverse effect for the Valley Loop Trail.</p>
Segment 2	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Remove campsites from Backpackers, Lower Pines, Upper Pines, and Yellow Pine campgrounds</p> <p>Restore areas with native vegetation</p> <p>Remove lodging facilities at Yosemite Lodge, and replace with campsites and day use areas</p> <p>Archeological sites would be considered in planning and avoided whenever possible</p>	<p><i>NEPA</i>: Long-term adverse impacts on known archeological resources from restoration, facilities demolition, removal, and other ground disturbing would potentially occur during active ground disturbance, and be local, minor to moderate, in cases where avoidance is not possible.</p> <p>Overall reduced visitor numbers would have a negligible impact on archeological sites.</p> <p><i>NHPA</i>: Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific.</p>
<b>Hydrologic/Geologic Resource Actions</b>			
Segment 2	Actions to Protect and Enhance River Values	<p>Remove Sugar Pine and Ahwahnee bridges and reroute trail that currently extends between these bridges</p>	<p><i>NEPA</i>: Removing the northern abutment of Sugar Pine Bridge would result in a local, long-term major adverse impact to the known archeological site. Mitigation measures may reduce the potential for this impact.</p> <p>Additional ground disturbing activities associated with removal of the bridges and rerouting trail may result in local, short- to long-term, minor, adverse impacts from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity. If previously unknown archeological sites are discovered during associated ground disturbing activities, site-specific, short-term, minor to moderate, adverse impacts may result from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity.</p>



**TABLE 9-247: IMPACTS FROM ALTERNATIVE 2 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Hydrologic/Geologic Resource Actions (cont.)</b>			
Segment 2 (cont.)			<i>NHPA</i> : Determination of effects is site specific, when avoidance is not possible. There is an adverse effect to the archeological site associated with Sugar Pine Bridge. Mitigation measures may reduce this impact.
<b>Programmatic Resource Actions</b>			
Segment 2	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Create new parking spaces west of Yosemite Lodge Construct a shuttle stop for Camp 4 Decrease peak day visitor numbers	<i>NEPA</i> : General reduction in focused visitor use at areas on or near known archeological resources would potentially result in local, long-term, minor to moderate beneficial impacts.  Overall reduced visitor numbers would have a negligible impact on archeological sites.  <i>NHPA</i> : In areas of known discovered sites, avoidance of archeological sites will occur when possible. Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site-specific.
Segments 3 and 4	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segments 3 and 4 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-246: Impacts from Actions Common to Alternatives 2–6
Segments 3 and 4	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Temporary housing units would be moved from Yosemite Valley to El Portal Administrative campsites from Yellow Pine Campground moved to area within Segment 4. Archeological sites would be considered in planning and avoided whenever possible	<i>NEPA</i> : Potential local, minor to moderate, adverse impacts from the relocation of housing units could result from ground-disturbing activities and concentration of uses in areas sensitive for archeological sites, in cases where avoidance is not possible.  <i>NHPA</i> : Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific.
<b>Biological Resource Actions</b>			
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Decommission Wawona Golf Course and return area to natural setting	<i>NEPA</i> : For the Wawona Golf Course, turf removal, recountouring of terrain, soil decompaction, revegetation, and/or other ground disturbing may occur in or near known archeological sites. During these actions, impacts would be site-specific, negligible to major, and potentially adverse.  <i>NHPA</i> : As both actions are within or near known archeological sites, there is an adverse effect.

**TABLE 9-247: IMPACTS FROM ALTERNATIVE 2 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>			
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Eliminate Wawona stables operations Remove Wawona tennis courts	<p><i>NEPA:</i> For the removal of Wawona tennis courts, soil decompaction, revegetation, and/or other ground disturbing would occur in or near a known archeological site. During these actions, effects would be site-specific, negligible to major, and potentially adverse, in cases where avoidance is not possible.</p> <p>Elimination of stables within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas.</p> <p><i>NHPA:</i> As actions are within or near known archeological sites, there is an adverse effect.</p>
<b>Programmatic Resource Actions</b>			
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Remove two stock campsites from Wawona stock camp Relocate sites to Wawona stables	<p><i>NEPA:</i> Actions to remove two stock campsites from near known archeological sites would result in localized long-term, beneficial impacts by stabilizing elements of archeological features and preventing future disturbances.</p> <p><i>NHPA:</i> As both actions are within or near known archeological sites, there is an adverse effect.</p>
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Remove two stock campsites from Wawona stock camp Remove 32 campsites in Wawona Campground Redesign bus stop at Wawona Store to accommodate visitor use	<p><i>NEPA:</i> Relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas.</p> <p>As the bus stop is near a known archeological site, unless avoidance is possible, there is a potential for local, long-term minor to moderate adverse impacts.</p> <p><i>NHPA:</i> As actions are within or near known archeological sites, there is an adverse effect.</p>

Ground disturbance associated with removal of infrastructure and restoration of former camping areas could displace artifacts (and result in increased erosion when avoidance is not possible) and perhaps result in discovery of previously unknown sites. Implementation of mitigation measure MM-AR-2 (testing, assessment, and treatment; see Appendix C) would reduce potential impacts.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Some of the proposed Alternative 2 actions in Segment 2 to protect and enhance river values have the potential to affect archeological resources. Proposed actions include restoring portions of Stoneman Meadow, removing portions of Southside Drive and the Curry Orchard parking lot, conducting several habitat restoration actions within the East Valley campgrounds, and removing the Sugar Pine and Ahwahnee bridges and rerouting the trail that currently extends between these bridges. Portions of the Valley Loop Trail would be rerouted out of the meadows. Additionally, Alternative 2 calls for the removal of housing and other constructions, between the Village Store and Ahwahnee Meadow and restoration of the area, including recontouring and revegetation activities.

There are no recorded archeological sites within Stoneman Meadow in the vicinity of the proposed restoration, nor have sites been recorded near the Curry Orchard parking lot or in the Boys Town housing area. The proposed partial restoration of the Curry Orchard parking lot would have no effect on archeological resources. Removal of 1,335 feet of Southside Drive and realigning the road through the Boys Town housing area would occur in areas not known to contain archeological resources, although there could be unanticipated discoveries during construction of the realigned road segment.

Several archeological sites are located at least partially within the East Valley campgrounds. Removal of campsites and associated infrastructure and subsequent restoration of native vegetation within the campground areas restoration actions would result in ground disturbing activities that may result in impacts if artifacts are displaced or soils temporarily exposed to erosion during decompaction or revegetation activities. Similarly, known cultural resources are in the vicinity of Housekeeping Camp. Avoidance of known archeological sites is always the preference; there could be unanticipated discoveries during ground disturbing activities. Site specific measures would be developed to avoid adverse effects when possible.

A large archeological site is directly adjacent to and likely beneath) the northern abutment of Sugar Pine Bridge. Removal of the Sugar Pine Bridge has the potential to adversely effect this resource. Other than this exception, no archeological resources have been recorded in the immediate vicinity of either the Sugar Pine or the Ahwahnee bridges, or the multiuse trail between these two bridges. Rerouting the trail to the north side of the river may result in the trail encroaching on one or more of the known archeological sites in the likely reroute area. Avoidance of known archeological sites is always the preference.

The Valley Loop Trail, itself a known historic property, would be rerouted out of wetland areas through Slaughterhouse and Bridalveil meadows. Although no archeological resources are recorded in

the area between the Village Store and Ahwahnee Meadow, recontouring and revegetation of this area after removal of housing and other construction could result in the inadvertent discovery of one or more deeply buried archeological resources. As a programmatic action, all trail reroutes would consider impacts on archeological resources and be located away from known archeological sites to the extent practicable. Mitigation measures MM-AR-2 and/or -3( see Appendix C) would be necessary if it is not possible to reroute the trail off of archeological resources.

While inadvertent discovery of archeological resources is not necessarily an impact in and of itself, discovery can result in damage to sites through exposure of artifacts to erosion, collection, and displacement. Implementation of mitigation measure MM-AR-1 (see Appendix C) is recommended to reduce potential impacts associated with inadvertent discovery. Likewise, a program of intensive surface survey and/or limited subsurface testing (MM-AR-2) is recommended for actions that would take place within or near the boundaries of a known archeological resource. An appropriate treatment plan could then be developed to reduce or avoid potential impacts associated with ground disturbance through construction or restoration. With implementation of these two mitigation measures, the potential to adversely effect resources from actions to protect and enhance river values in Segment 2 would be reduced or avoided.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 2, campsites would be removed or relocated from Backpackers, Lower Pines, North Pines, Upper Pines, and Yellow Pine campgrounds. Removal areas would be restored with native vegetation. Lodging facilities at Yosemite Lodge would also be removed and replaced with campsites and day use areas. Some new parking spaces would be created west of Yosemite Lodge, a formal shuttle stop would be constructed for Camp 4 (Sunnyside Campground), and overall peak day visitor numbers to the Valley would decrease over current rates.

Known archeological sites exist within or adjacent to portions of the Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds. Removal of campsites from these areas and restoration of native vegetation would reduce impacts to known archeological sites by stabilizing ground surfaces and reducing erosion, trampling, and artifact collection that can result from heavy visitor use. Ground disturbance associated with revegetation activities, including use of any heavy machinery may impact archeological sites. Avoidance of known archeological sites is always preferred.

No archeological sites have been recorded in or adjacent to the Yellow Pine administrative group campsites. Removal of the campsites and restoration of the area to a natural condition would not result in any impacts on archeological resources in Segment 2. Relocating administrative camping to the Abbieville and Trailer Village area in El Portal (Segment 4) would potentially affect a known archeological site in that area, as is discussed in the “Segments 3 and 4: Merced River Gorge and El Portal” subsection below. Similarly, replacing removed sites at Backpackers Campground at a western extension of the campground, and creating new camping areas and day-use facilities in the Yosemite Lodge area would occur within or near known sites.

The reduced numbers of day use and overnight visitors proposed under Alternative 2 actions to manage visitor use and facilities in Segment 2 would not have a measureable effect on archeological

resources. While visitor use can and does affect sites, effects are much more dependent on localized use specific to areas that contain one or more archeological resources. A reduction in the overall visitor numbers would not necessarily reduce impacts on individual sites.

When archeological sites cannot be avoided, implementation of mitigation measures MM-AR-2 (controlled subsurface testing and treatment plan; see Appendix C) and/or MM-AR-3 archeological monitoring(see Appendix C) would reduce the potential adverse. Similarly, implementation of MM-AR-2 would reduce adverse effects associated with construction of new or replacement campsites, parking spaces, and a shuttle stop.

**Yosemite Lodge and Camp 4.** Proposed new parking spaces west of Yosemite Lodge could encroach on a known archeological site in Segment 2. Ground disturbance associated with the creation of a parking lot could result in site-specific, minor to moderate, adverse effects on shallow subsurface cultural deposits. Under NHPA, this would result in an assessment of adverse effect. Ground disturbance associated with revegetation activities, including use of any heavy machinery may impact archeological sites. Construction of a formal shuttle stop at Camp 4 Sunnyside Campground) could also encroach on a known archeological site. Avoidance of known archeological sites is always preferred.

#### **Segments 3 and 4: Merced River Gorge and El Portal**

##### *Impacts of Actions to Protect and Enhance River Values*

None of the proposed Alternative 2 actions to protect and enhance river values in Segments 3 and 4, other than those actions common to Alternatives 2-6, would affect archeological resources.

##### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 2, the Abbieville and Trailer Village area would be used for relocation of employee housing units from Yosemite Valley; administrative campsites from the Yellow Pine Campground would also be relocated to this area in Segment 4. Avoidance of known archeological sites is always preferred. When unavoidable, these actions have the potential to affect a known archeological site by concentrating uses onto the site and through ground disturbances associated with construction/relocation of housing units.

Implementation of mitigation measure MM-AR-2 (see Appendix C) would result in a program of intensive surface survey and/or limited subsurface testing to determine the nature of cultural materials in areas proposed for housing and camping. An appropriate treatment plan could then be developed, including modification of the proposed actions to avoid impacts, data recovery of selected site areas, and/or archeological monitoring during ground-disturbing activities mitigation measure (MM-AR-3). Adhering to this process would reduce potential impacts.

## Segments 5, 6, 7 and 8: South Fork Merced River

### *Impacts of Actions to Protect and Enhance River Values*

Under Alternative 2 in Segment 7, the Wawona Golf Course would be decommissioned and the area returned to a more natural setting through recontouring and revegetation. Two stock campsites would also be removed from the Wawona stock camp, and relocated to the Wawona stables.

Portions of several archeological sites are located within the Wawona Golf Course. Removal of the golf course, including turf removal and recontouring of terrain to a more natural landscape, has the potential to unearth artifacts associated with these sites, diminishing the ability to interpret the sites' stratigraphy and cultural patterning. Mitigation would be recommended for the proposed Wawona Golf Course removal and meadow restoration. Mitigation measure MM-AR-2 (see Appendix C) outlines a process of limited subsurface testing and development of an appropriate treatment plan for sites; the treatment plan could include modification of the proposed action to avoid impacts, data recovery of certain areas of the site, and/or archeological monitoring mitigation measure (MM-AR-3). These measures would reduce or avoid potential impacts.

Two stock campsites would be removed from the Wawona stock camp to halt trampling and erosion impacts on a sensitive cultural resource area. Replanted vegetation would stabilize the ground surface and may prevent further artifact displacement.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 2, Wawona stables operations would be eliminated and two stock campsites would be relocated to this area from the current Wawona stock camp. The Wawona tennis courts would be removed, and 32 campsites in the Wawona Campground would be removed from the floodplain and/or from cultural sites. A bus stop, near a known archeological site, would be redesigned. Each of these actions would have the potential to impact archeological resources in Segment 7.

Two stock campsites would be removed from the Wawona stock camp to halt trampling and erosion impacts on a sensitive cultural resource area. These sites would be relocated to an area at the Wawona stables, and the stables would no longer offer day rides or operate as they currently do. Replanted vegetation would stabilize the ground surface and prevent further artifact displacement.

The Wawona tennis courts are located within a multicomponent archeological site. Removal of the tennis courts may cause disturbance to the site on shallow cultural deposits of the site. An archeological monitor mitigation measure (MM-AR-3) is recommended during the removal of the Wawona tennis courts to ensure that the potential for impacts related to ground disturbance would be reduced.

Also in Segment 7, the Wawona Campground includes all or portions of at least two distinct archeological sites. The proposed removal of 32 sites within the floodplain and in the former location of A.E. Wood Campground within the Wawona Archeological District (that is National Register-eligible) would potentially reduce or avoid ongoing impacts on this site.

## **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

Under NEPA, a portion of the management actions under Alternative 2 would have the potential to result in site-specific and local, minor to major effects on known prehistoric and historic-era archeological resources through ground-disturbing actions related to restoration, construction, and facilities removal. These could result in short-term exposure of site soils to erosional forces, displacement of artifacts, and diminished integrity of horizontal and vertical site patterning. Mitigation measure MM-AR-2 (see Appendix C) would delineate the process by which a site could be tested and characterized, and an appropriate treatment plan developed. Mitigation measure MM-AR-3 (see Appendix C) would provide for an archeological monitor to be present for minimally invasive construction and restoration ground-disturbing activities within sites. These measures would reduce the potential impacts of relevant actions.

Other management actions under Alternative 2 would include ground-disturbing activities in areas that do not contain documented archeological resources, but where such resources may be present in a buried context. Impacts related to inadvertent discovery could range from minor to moderate, depending on the nature of the find and on the extent of damage. Mitigation measure MM-AR-1 (see Appendix C) describes the process by which any unanticipated discoveries would be handled so as to minimize disturbances to previously unknown sites. When implemented, this measure would reduce potential impacts associated with inadvertent discoveries during relevant actions.

A portion of the management actions associated with Alternative 2 would result in long-term, beneficial impacts on known archeological sites, either through restrictions on types of visitor use that can cause damage to sites (camping), restoration of areas that have been the focus of inappropriate use (such as informal trails or recreational facilities), or stabilization of site surfaces through revegetation and other restorative actions. In some instances, actions that may ultimately benefit a resource also have the potential to adversely affect site elements if done in an inappropriate or careless manner. Mitigation recommendations have been included in the impact discussion (in Appendix C) as appropriate.

In areas of known or newly discovered sites, intensity of impacts on archeological resources relates to the importance of the information they contain and the extent of disturbance or degradation. Even the disturbance of a small portion of a rare or unstudied site type (impacts to less than 10% of the total site area) can be considered an adverse effect to a site's integrity. Conversely, impacts to 25% or more of the site area of a well-known and common site type may be considered not adverse. As above, implementation of mitigation measures would reduce the potential for adverse effects.

## **Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

### ***Past Actions***

Past actions listed in Appendix C included some manner of ground-disturbing activities (road construction, housing unit removal or construction, recontouring land for habitat restoration), were subject to federal regulations, including NEPA and section 106 of the NHPA. The 2008 programmatic agreement (and the currently planned MRP-specific programmatic agreement) contains provisions for

archeological survey, testing, monitoring, and data recovery prior to each project. Information learned during this process continues to inform the current body of knowledge about archeological resources at Yosemite. To date, several major archeological research projects have resulted from activities conducted for these actions, with at least two additional reports (Wahhoga and Crane Flat Utilities projects) in progress.

### ***Present Actions***

The *Yosemite Fire Management Plan* contains provisions regarding proper treatment and recording of archeological resources; this plan does not contain specific plans for archeological research. In addition to the *Yosemite Fire Management Plan*, the *Programmatic Parkwide Yosemite Facelift Volunteer Event* (2011) resulted in categorical exclusions signifying that no significant environmental effects (including effects on cultural resources) has occurred or will occur.

### ***Reasonably Foreseeable Future Actions***

By following the processes and provisions of federal regulations and internal documents (e.g., the 1999 and/or 2008 programmatic agreements, *2006 Management Policies*, and others), the park would identify archeological resources in any areas scheduled for ground-disturbing actions and provide worker education, monitoring, and/or subsurface testing to reduce or avoid potential impacts. If mitigation through these means is not feasible, park archeologists may consult with the ACHP to resolve adverse effects. Beneficial impacts on individual sites may result from restoration of natural vegetation communities and resulting reduction of erosion, trampling, and other visitor use impacts.

### ***Overall Cumulative Impact from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

Many of the combined past, present, and reasonably foreseeable future actions would have a negligible or beneficial impact on archeological resources. For those actions with potential adverse impacts, implementation of all appropriate mitigation and consultation would reduce or avoid those impacts. With avoidance measures in places, many sites may still be adversely affected by facilities construction, especially in Yosemite Valley and El Portal.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **All River Segments**

Table 9-248 summarizes proposed actions under Alternative 3, and potential impacts to archeological sites, and then offers analysis under NEPA and NHPA regulations.

#### ***Impacts of Actions to Protect and Enhance River Values***

None of the proposed Alternative 3 actions to protect and enhance river values, other than those actions common to Alternatives 2–6, would have the potential to affect archeological resources.



**TABLE 9-248: IMPACTS FROM ALTERNATIVE 3 ACTIONS**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
All segments	Actions to Protect and Enhance River Values	None of the overall actions to protect and enhance river values in all river segments would affect archeological resources beyond those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
All segments	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	None of the overall actions in any of the river segments to manage visitor use and facilities would affect archeological resources beyond except those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
Segment 1	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segment 1 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
<b>Biological Resource Actions</b>			
Segment 1	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Reduce designated camping and remove bear boxes at Little Yosemite Valley Backpackers Campground</p> <p>Convert Merced Lake High Sierra Camp into temporary pack camp, removing permanent infrastructure</p> <p>Expand Merced Lake Backpackers Campground into portions of former Merced Lake High Sierra Camp</p> <p>Limit numbers of hikers</p>	<p><i>NEPA:</i> Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in local, long-term beneficial impacts on known archeological site found within the Yosemite Valley Backpackers Campground and Merced Lake High Sierra Camp area.</p> <p>Proposed expansion of the Merced Lake Backpackers Campground is proposed in an area without archeological sites; there would be no adverse impact.</p> <p>Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in local, long-term, minor, adverse impacts on known archeological sites, in cases where avoidance is not possible.</p> <p><i>NHPA:</i> There are not NRHP listed, or sites determined to be NRHP eligible in Segment 1. No historic properties would be affected.</p>
Segment 2	Actions to Protect and Enhance River Values	<p>Restore portions of Stoneman Meadow</p> <p>Remove portions of Southside Drive and the Curry Orchard parking lot</p> <p>Conduct several habitat restoration actions within the East Valley campgrounds</p>	<p><i>NEPA:</i> In areas where no archeological resources have been recorded Stoneman Meadow, Curry Orchard parking Lot, Boys Town housing area, Village Store, Ahwanee Meadow), there is no adverse impact.</p> <p>Proposed removal of campsites and associated infrastructure within the East Valley campgrounds would result in local, minor to moderate long-term beneficial impact on known archeological sites found within the campgrounds, by redirecting and/or reducing visitor use.</p>

**TABLE 9-248: IMPACTS FROM ALTERNATIVE 3 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>			
Segment cont.)		<p>Remove facilities and infrastructure, conversion of the area into day use river access and picnicking in Housekeeping Camp</p> <p>Remove Sugar Pine and Ahwahnee bridges and reroute trail that currently extends between these bridges</p> <p>Reroute portions of the Valley Loop Trail out of the meadow</p> <p>Archeological sites would be considered in planning and avoided whenever possible</p>	<p>When avoidance is not possible, ground disturbing activities associated with removal of infrastructure, restoration of former camping areas, bridge replacement, and trail rerouting may result in local, long-term, minor to moderate adverse impacts from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity.</p> <p>Removing the northern abutment of Sugar Pine Bridge would result in a long-term major adverse impact to the known archeological site, assuming avoidance is not possible.</p> <p>Ground disturbance and rerouting of the Valley Loop Trail would result in a local, long-term moderate to major adverse impact, as this trail is itself an historic property.</p> <p><i>NHPA</i>: Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific, when avoidance is not possible.</p> <p>Removal of the Sugar Pine Bridge and rerouting of the Valley Loop Trail would result in an adverse effect. Mitigation measures may reduce the potential for adverse effects.</p>
<b>Programmatic Resource Actions</b>			
Segment 2	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Remove and/or relocate campsites from Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds</p> <p>Restore areas with native vegetation</p> <p>Create new recreational vehicle campsites at Upper Pines Loop addition</p> <p>Remove various facilities associated with Yosemite lodge</p> <p>Construct new concessioner employee housing and parking areas</p> <p>Construct new parking west of Yosemite Lodge</p> <p>Construct a shuttle stop for Camp 4</p> <p>Reroute Northside Drive south of the parking area, and formalize Camp 6/Village Center Parking Area</p>	<p><i>NEPA</i>: Reduction in focused visitor use at areas on or near known archeological resources would potentially result in local, long-term beneficial impacts.</p> <p>Adverse impacts on known archeological resources from restoration, facilities demolition, removal, and other ground disturbing would potentially occur during active ground disturbance, and be local, long-term minor to moderate adverse in cases where avoidance is not possible.</p> <p>Overall reduced visitor numbers would have a negligible effect on archeological sites.</p> <p><i>NHPA</i>: Determination of effects is site specific.</p>

**TABLE 9-248: IMPACTS FROM ALTERNATIVE 3 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Programmatic Resource Actions (cont.)</b>			
Segment 2 cont.)		Decrease peak day visitor numbers Archeological sites would be considered in planning and avoided whenever possible	
Segments 3 and 4	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segments 3 and 4 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-246: Impacts from Actions Common to Alternatives 2–6
Segments 3 and 4	Manage Visitor Use and Facilities	Construction of replacement employee housing and administrative group camping in the Abbeville/Trailer Village area  Archeological sites would be considered in planning and avoided whenever possible	<i>NEPA</i> : Adverse impacts on known archeological resources from restoration, facilities demolition, removal, and other ground disturbing would potentially occur during active ground disturbance, and be local, long-term minor to moderate adverse in cases where avoidance Site specific measures would be developed to avoid adverse effects when possible. is not possible.  <i>NHPA</i> : Determination of effects is site specific.
<b>Biological Resource Actions</b>			
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Eliminate Wawona stables operations  Archeological sites would be considered in planning and avoided	<i>NEPA</i> : Elimination of stables, relocation of stock campsites, and removal of camping sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas.  <i>NHPA</i> : No historic properties are affected.
<b>Programmatic Resource Actions</b>			
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Remove two stock campsites from Wawona stock camp  Relocate sites to Wawona stables  Archeological sites would be considered in planning and avoided	<i>NEPA</i> : Actions to remove two stock campsites from near known archeological sites may have a long-term, beneficial impact on archeological sites within and near these areas.  <i>NHPA</i> : No historic properties are affected.
Segments 5, 6, 7, and 8	Manage Visitor Use and Facilities	Remove two stock campsites from Wawona stock camp  Remove Wawona tennis courts  Remove 32 campsites in Wawona Campground  Redesign bus stop at Wawona Store	<i>NEPA</i> : Actions to remove campsites from near known archeological sites may have a long-term, beneficial impact on archeological sites within and near these areas.  Soil decompaction, revegetation, and/or other ground disturbing activities would occur in or near a known archeological site. During these actions, adverse impacts would be local, long-term, and minor to moderate.  <i>NHPA</i> : As actions are within or near known archeological sites, there is an adverse effect. Mitigation measures may reduce the potential for adverse effects.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

None of the proposed Alternative 3 actions to manage visitor use and facilities, other than those actions common to Alternatives 2–6, would have the potential to affect archeological resources.

**Segment 1: Merced River above Nevada Fall***Impacts of Actions to Protect and Enhance River Values*

None of the proposed Alternative 3 actions to protect and enhance river values, other than those actions common to Alternatives 2–6, would have the potential to affect archeological resources in Segment 1.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Several actions related to management of visitor use and facilities would have the potential to affect archeological resources in Segment 1. These actions include reducing designated camping and removing bear boxes at Little Yosemite Valley Backpackers Campground; converting the Merced Lake High Sierra Camp into a temporary pack camp with a daily limit of 15 people, removing permanent infrastructure, and redesignating the area as Wilderness; and expanding Merced Lake Backpackers Campground into portions of the former Merced Lake High Sierra Camp. Ground disturbance associated with these actions could displace artifacts and result in increased erosion. Limits on the number of hikers between Little Yosemite Valley and Merced Lake would also be enacted through a pass or wilderness trailhead quota system. Under NEPA, ground disturbance on or near archeological sites would result in local, long-term, minor to moderate adverse impacts. There are not NRHP listed, or sites determined to be eligible for the NRHP in Segment 1. Under NHPA, no historic properties would be affected.

Little Yosemite Valley Campground is largely within a known prehistoric archeological site. The proposed reduction in designated campsites and removal of bear boxes would potentially result reduce the number of visitors, thereby lessening erosion and trampling.

The Merced Lake High Sierra Camp is also partially within a known prehistoric archeological site. Proposed conversion of the camp to a temporary pack camp with a limit of 15 daily visitors, removal of permanent infrastructure, and restoration of the area to a natural condition, would remove some sources of concentrated visitor use disturbances. A portion of the area would be used for an expansion of the Merced Lake Backpackers Campground.

The trail between Little Yosemite Valley and Merced Lake crosses within or near the known boundaries of several archeological sites. Limiting pedestrian traffic on this trail through a zone pass or wilderness trailhead quota system (75 hikers daily limit) would reduce the potential for disturbance on these sites through trampling, erosion, vandalism, or artifact collection.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Some of the Alternative 3 proposed actions in Segment 2 to protect and enhance river values have the potential to disturb archeological resources. Proposed actions include several habitat restoration actions within the East Valley campgrounds, and the removal of the Sugar Pine and Ahwahnee bridges and rerouting the trail that currently extends between these bridges. Portions of the Valley Loop Trail would also be rerouted onto upland areas in Slaughterhouse and Bridalveil meadows. Actions relating to the restoration of Stoneman Meadow and Curry Orchard parking lot, and realignment of Southside Drive through the Boys Town housing area do not occur in the vicinity of archeological sites.

Under Alternative 3, some campsites would be removed from the East Valley campgrounds, and limited restoration of floodplains and other sensitive habitats would occur. Several archeological sites are located at least partially within the East Valley campgrounds. Removal of campsites and associated infrastructure and subsequent restoration of native vegetation within the campground areas would reduce visitor impact, although the restoration actions themselves could cause adverse impacts if artifacts are displaced or soils temporarily exposed to erosion during decompaction or revegetation activities. Similarly, known cultural resources are in the vicinity of Housekeeping Camp.

Avoidance of known archeological sites is always the preference; there could be unanticipated discoveries during ground disturbing activities.

Alternative 3 calls for removal of the Sugar Pine and Ahwahnee bridges, and some rerouting of the associated trail. A large archeological site is directly adjacent to (and likely beneath) the northern abutment of Sugar Pine Bridge. Removal of Sugar Pine Bridge has the potential to cause an adverse effect on this archeological resource. Other than this exception, no archeological resources have been recorded in the immediate vicinity of either the Sugar Pine or the Ahwahnee bridges, or the multiuse trail between these two bridges. Rerouting the trail to the north side of the river may result in the trail encroaching on one or more of the known archeological sites in the likely reroute area. Avoidance of known archeological sites is always the preference.

The Valley Loop Trail, itself a known historic property, would be rerouted out of wetland areas through Slaughterhouse and Bridalveil meadows. Changes to this Trail is an adverse impact (NEPA) and effect (NHPA). Although no archeological resources are recorded in the area between the Village Store and Ahwahnee Meadow, recontouring and revegetation of this area after removal of housing and other construction could result in the inadvertent discovery of one or more deeply buried archeological resources. As a programmatic action, all trail reroutes would consider impacts on archeological resources and be located away from known archeological sites to the extent practicable. Mitigation measures MM-AR-2 (and/or -3, see Appendix C) would be necessary if it is not possible to reroute the trail off of archeological resources.

While inadvertent discovery of archeological resources is not necessarily an impact in and of itself, discovery can result in damage to sites through exposure of artifacts to erosion, collection, and displacement. Implementation of mitigation measure MM-AR-1 (see Appendix C) is recommended to reduce or avoid the potential impacts associated with inadvertent discovery. Likewise, a program of

intensive surface survey (and/or limited subsurface testing mitigation measure MM-AR-2, see Appendix C) is recommended for actions that would take place within or near the boundaries of a known archeological resource. An appropriate treatment plan could then be developed to reduce or avoid potential adverse impacts and effects associated with ground disturbance through construction or restoration.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 3, some campsites would be removed or relocated from Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds. Removal areas would be restored with native vegetation. New recreational vehicle (RV) campsites would be constructed at the Upper Pines Loop addition. Various facilities associated with Yosemite Lodge would be removed, and new concessioner employee housing and parking would be constructed in areas close to known archeological sites. New parking would also be provided west of Yosemite Lodge, and a formal shuttle stop would be constructed for Camp 4. Overall, peak day visitor numbers to the Valley would decrease over current rates.

Under Alternative 3, removal of campsites from sensitive areas in the Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds and restoration of native vegetation would lessen visitor impact, stabilize ground surface, and reduce erosion, trampling, and artifact collection that can result from heavy visitor use. Ground disturbance associated with revegetation activities, including use of any heavy machinery, could disturb shallow cultural deposits.

Replacement of removed sites at Backpackers Campground at a western extension of the campground and construction of new concessioners' housing and parking near Yosemite Lodge would occur within or near known sites in Segment 2. All ground-disturbing activities associated with the creation of new campsites and facilities would have the potential to adversely impact those sites.

The reduced numbers of day use and overnight visitors proposed under the Alternative 3 actions to manage visitor use and facilities in Segment 2 would not have a measureable effect on archeological resources. While visitor use can and does affect sites, impacts are much more dependent on local use specific to areas that contain one or more archeological resources. A reduction in the overall visitor numbers would not necessarily reduce impacts on individual sites.

Restoration of floodplain and other ecosystems in former campsites would result a potential for impacts restoration activities. Implementation of mitigation measures MM-AR-2 (controlled subsurface testing and treatment plan) and/or MM-AR-3 (archeological monitoring) presented in Appendix C would reduce or avoid the potential adverse effects. Similarly, implementation of MM-AR-2 would reduce or avoid adverse effects associated with construction of new or replacement campsites, concessioners' housing, parking spaces, and a shuttle stop.

**Yosemite Lodge and Camp 4.** Under Alternative 3, proposed new parking spaces west of Yosemite Lodge and a formal shuttle stop at Camp 4 could encroach on known archeological sites. Ground disturbances associated with these actions could result in adverse impacts on shallow subsurface cultural deposits.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions under Alternative 3 to protect and enhance river values in Segments 3 and 4 would affect archeological resources beyond those actions common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

No actions under Alternative 3 to manage visitor use and facilities in Segments 3 and 4 would affect archeological resources beyond those actions common to Alternatives 2–6.

### **Segments 5, 6, 7 and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 3, actions include removal and restoration of the Wawona Golf Course and relocation of two Wawona stock camp sites out of a known cultural site to a location next to the Wawona stables. Mitigation measures MM-AR-2 (and/or 3 see Appendix C) are recommended to avoid potential adverse effects, resulting in no historic properties affected.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 3, the Wawona tennis courts would be removed and two stock campsites would be relocated to the Wawona stables from their current location within a sensitive resource area in the Wawona stock camp. Similarly, some campsites would be removed from archeological sites within the Wawona Campground. A bus stop at Wawona Store would be redesigned to accommodate visitor use.

Implementation of mitigation measure MM-AR-3 (archeological monitoring, see Appendix C) during removal of the tennis courts would reduce or avoid potential adverse effects.

### **Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

A number of the Alternative 3 management actions would have the potential to result in minor to major impacts on known prehistoric and historic-era archeological resources through ground-disturbing actions related to restoration, construction, and facilities removal. These could result in short-term exposure of site soils to erosional forces, displacement of artifacts, and diminished integrity of horizontal and vertical site patterning. Mitigation measure MM-AR-2 (see Appendix C) would delineate the process by which a site could be tested and characterized, and an appropriate treatment plan developed. Mitigation measure MM-AR-3 (see Appendix C) would provide for an archeological monitor to be present for minimally invasive construction and restoration ground-disturbing activities within sites. Under NHPA, these measures would help to avoid, minimize, or reduce potential adverse effects associated with the proposed actions.

Some of the management actions associated with Alternative 3 would result in long-term, beneficial impacts on known archeological sites, either through restrictions on types of visitor use that can cause damage to sites (camping), restoration of areas that have been the focus of inappropriate use such as informal trails or recreational facilities), or stabilization of site surfaces through revegetation and other restorative actions. In some instances, actions that may ultimately benefit a resource also have the potential to adversely impact site elements if done in an inappropriate or careless manner. Mitigation recommendations have been included in the impact discussion as appropriate, to reduce or avoid adverse effects. Under Alternative 3, fewer campsites and other facilities would be removed from archeologically sensitive areas, but correspondingly less new construction would occur in known archeological sites.

### **Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

#### ***Past Actions***

Past actions listed in Appendix C included some manner of ground-disturbing activities (road construction, housing unit removal or construction, recontouring land for habitat restoration), were subject to federal regulations, including NEPA and section 106 of the NHPA. Furthermore, the 2008 programmatic agreement contains provisions for an archeological survey, testing, monitoring, and data recovery prior to each project. Information learned during this process continues to inform the current body of knowledge about archeological resources at Yosemite. To date, several major archeological research projects have resulted from activities conducted for these actions, with at least two additional reports (Wahhoga and Crane Flat Utilities projects) in progress.

#### ***Present Actions***

The *Yosemite Fire Management Plan* contains provisions regarding proper treatment and recording of archeological resources; however, this plan does not contain specific plans for archeological research. In addition to the *Yosemite Fire Management Plan*, the *Programmatic Parkwide Yosemite Facelift Volunteer Event* (2011) resulted in categorical exclusions signifying that no significant environmental effects including effects on cultural resources) has occurred or will occur.

#### ***Reasonably Foreseeable Future Actions***

By following the processes and provisions of federal regulations and internal documents (e.g., the 1999 and/or 2008 programmatic agreements, *Management Policies 2006*, and others), the park would identify archeological resources in any areas scheduled for ground-disturbing actions and provide worker education, monitoring, and/or subsurface testing to reduce potential adverse effects. If mitigation through these means is not feasible, park archeologists may consult with the ACHP. With avoidance measures in place, many sites may still be adversely affected by facilities construction, especially in Yosemite Valley and El Portal. Beneficial impacts on individual sites may result from restoration of natural vegetation communities and resulting reduction of erosion, trampling, and other visitor use impacts.



***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

Many of the combined past, present, and reasonably foreseeable future actions would have a negligible or beneficial impact on archeological resources. For those actions with potential adverse impacts, implementation of all appropriate mitigation and consultation would reduce the potential for, or avoid those impacts.

***Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration***

**All River Segments**

Table 9-249 summarizes proposed actions under Alternative 4, and potential impacts to archeological sites, and then offers analysis under NEPA and NHPA regulations.

***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values, other than those actions common to Alternatives 2–6, would have the potential to affect archeological resources.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

None of the proposed Alternative 4 actions to manage visitor use and facilities, other than those actions common to Alternatives 2–6, would have the potential to affect archeological resources.

**Segment 1: Merced River above Nevada Fall**

***Impacts of Actions to Protect and Enhance River Values***

None of the proposed Alternative 4 actions to protect and enhance river values, other than those actions common to Alternatives 2–6, would have the potential to affect archeological resources.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Some of the Alternative 4 actions related to management of visitor use and facilities in Segment 1 include reducing designated camping and removing bear boxes at Little Yosemite Valley Backpackers Campground, and expanding Merced Lake Backpackers Campground into the former Merced Lake High Sierra Camp. The Merced Lake High Sierra Camp would be closed, restored to a natural condition, and redesignated as Wilderness, while limits on the number of hikers between Little Yosemite Valley and Merced Lake would also be enacted through a pass or wilderness trailhead quota system.

Little Yosemite Valley Campground is located largely within a known prehistoric archeological site. The proposed reduction in designated campsites and removal of bear boxes under Alternative 4 would reduce the number of visitors, thereby lessening erosion and trampling.

**TABLE 9-249: IMPACTS FROM ALTERNATIVE 4 ACTIONS**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
All segments	Actions to Protect and Enhance River Values	None of the overall actions to protect and enhance river values in all river segments would affect archeological resources beyond those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
All segments	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	None of the overall actions in any of the river segments to manage visitor use and facilities would affect archeological resources beyond except those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
Segment 1	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segment 1 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
<b>Biological Resource Actions</b>			
Segment 1	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Reduce designated camping and remove bear boxes at Little Yosemite Valley Backpackers Campground</p> <p>Expand Merced Lake Backpackers Campground into portions of former Merced Lake High Sierra Camp</p> <p>Close Merced Lake High Sierra Camp, with restoration</p> <p>Limit numbers of hikers</p> <p>Archeological sites would be considered in planning and avoided when possible</p>	<p><i>NEPA:</i> Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in a local, long-term beneficial impact on known archeological sites found within the Yosemite Valley Backpackers Campground and Merced Lake High Sierra Camp area, by redirecting visitor use away from sensitive areas. Proposed expansion of the Merced Lake Backpackers Campground is proposed in an area without archeological sites; there would be no adverse impact.</p> <p>Assuming avoidance is not possible, ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in local, long-term, minor to moderate adverse impacts on known archeological sites.</p> <p><i>NHPA:</i> There are not NRHP listed, or sites determined to be eligible for NRHP eligible sites in Segment 1. No historic properties would be affected.</p>
Segment 2	Actions to Protect and Enhance River Values	<p>Restore portions of Stoneman Meadow</p> <p>Remove portions of Southside Drive and the Curry Orchard parking lot</p> <p>Conduct several habitat restoration actions within the East Valley campgrounds</p> <p>Remove facilities and infrastructure</p> <p>restoration of floodplain and riparian habitat in Housekeeping Camp</p>	<p><i>NEPA:</i> In areas where no archeological resources have been recorded Stoneman Meadow, Curry Orchard parking Lot, Boys Town housing area), there would be a negligible impact on archeological properties.</p> <p>Proposed removal of campsites and associated infrastructure within the East Valley campgrounds would potentially result in local, long-term beneficial impacts on the known archeological sites found within the campgrounds, by redirecting visitor use away from sensitive areas.</p>

**TABLE 9-249: IMPACTS FROM ALTERNATIVE 4 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>			
Segment 2 (cont.)		<p>Remove Sugar Pine and Ahwahnee bridges and reroute trail that currently extends between these bridges</p> <p>Reroute portions of the Valley Loop Trail out of the meadow</p> <p>Archeological sites would be considered in planning and avoided when possible</p>	<p>Ground disturbing activities associated with removal of infrastructure and facilities, and restoration of former camping areas may result in local, long-term, minor to moderate, adverse impacts from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity, in cases where avoidance is not possible.</p> <p>Removing the northern abutment of Sugar Pine Bridge would result in a local, long-term major adverse impact to the known archeological site. Ground disturbing activities associated with removal of the bridges and rerouting the associated trail may also result in local, long-term, minor to major adverse effects from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity.</p> <p>Ground disturbance and rerouting of the Valley Loop Trail would result in a local, long-term major adverse effect, as this trail is itself an historic property.</p> <p><i>NHPA</i>: Determination of effects is site specific, when avoidance is not possible.</p> <p>Removal of the Sugar Pine Bridge and rerouting of the Valley Loop Trail would result in an adverse effect. Mitigation measures may reduce the effects.</p>
<b>Programmatic Resource Actions</b>			
Segment 2	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Remove and/or relocate campsites from Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds</p> <p>Restore areas with native vegetation</p> <p>Create new recreational vehicle campsites at Upper Pines Loop addition</p> <p>Create new campsites at the Upper and Lower River campgrounds, Upper Pines addition, the Curry Village stables area, and west of Yosemite lodge</p> <p>Remove various facilities associated with Yosemite lodge</p> <p>Move Camp 6 north from the river, and formalize parking in Camp 6/Village Parking Area</p> <p>Construct new concessioner employee housing and parking areas</p>	<p><i>NEPA</i>: General reduction in focused visitor use at areas on or near known archeological resources would potentially result in a local, long-term beneficial impact.</p> <p>Adverse impacts on known archeological resources from restoration, facilities demolition, removal, new construction and other ground disturbing activities would be local, long-term, and minor to moderate, in cases where avoidance is not possible.</p> <p><i>NHPA</i>: Determination of effects is site specific, when avoidance is not possible.</p>

**TABLE 9-249: IMPACTS FROM ALTERNATIVE 4 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Programmatic Resource Actions (cont.)</b>			
Segment 2 (cont.)		Construct new parking west of Yosemite Lodge Construct a pedestrian underpass and roundabout at the Village Drive/Northside Drive intersection Construct a shuttle stop for Camp 4 Archeological sites would be considered in planning and avoided when possible	
Segments 3 and 4	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segments 3 and 4 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
Segments 3 and 4	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Construction of high-density employee housing and remote visitor parking in Abbieville and Trailer Village	<i>NEPA</i> : Assuming avoidance is not possible, ground disturbing may occur in or near known archeological site. During these actions, impacts would be local, long-term, minor to moderate, and adverse. <i>NHPA</i> : As actions are within or near a known archeological site, there is an adverse effect, unless avoidance is possible.
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Remove two stock campsites from Wawona stock camp Relocate sites to Wawona stables Continued use of Wawona golfcourse	<i>NEPA</i> : Actions to remove two stock campsites from near known archeological sites would result in local long-term, beneficial impacts by stabilizing elements of archeological features and preventing future disturbances. At the Wawona Golf Course, continued use of golf course will occur in or near known archeological sites; impacts would likely be negligible as golf course fill covers the site. <i>NHPA</i> : These actions would not affect historic properties.
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Remove two stock campsites from Wawona stock camp Remove 32 campsites in Wawona Campground	<i>NEPA</i> : Relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas, by redirecting visitors away from sensitive areas. Ground disturbing may occur in or near known archeological site during these actions, and there would be local, long-term, minor to moderate adverse impacts. <i>NHPA</i> : Determination of effects is site specific, when avoidance is not possible.

The Merced Lake High Sierra Camp is located partially within a known prehistoric archeological site. Closure of the camp and its infrastructure, with restoration of the area to a natural condition would remove some sources of concentrated visitor-use disturbances.

The trail between Little Yosemite Valley and Merced Lake crosses within or near the known boundaries of several archeological sites. Limiting pedestrian traffic on this trail through a zone pass or wilderness trailhead quota system (limit 100 hikers daily) would reduce the potential for disturbances to these sites by trampling, erosion, vandalism, or artifact collection.

There are not NRHP listed, or sites determined to be NRHP eligible in Segment 1. Under NHPA, no historic properties would be affected.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Some of the Alternative 4 proposed actions to protect and enhance river values in Segment 2 have the potential to impact archeological resources. Proposed actions include restoring portions of Stoneman Meadow, removing portions of Southside Drive and the Curry Orchard Parking Area, conducting several habitat restoration actions within the East Valley campgrounds, rerouting portions of the Valley Loop Trail, and removing the Sugar Pine and Ahwahnee bridges and rerouting the trail that currently extends between these bridges.

There are no recorded archeological sites within Stoneman Meadow in the vicinity of the proposed restoration, nor have sites been recorded near the Curry Orchard Parking Area or in the Boys Town housing area. The proposed partial restoration of the Curry Orchard Parking Area is not in the vicinity of archeological resources. Removal of 1,335 feet of Southside Drive and realigning the road through the Boys Town housing area would occur in areas not known to contain archeological resources.

Under Alternative 4, removal of campsites from the East Valley campgrounds and restoration of floodplains and other sensitive habitats would be identical to that proposed under Alternative 3. Several archeological sites are located at least partially within the East Valley campgrounds. Removal of campsites and associated infrastructure and subsequent restoration of native vegetation within the campground areas would reduce visitor disturbance, although the restoration actions themselves could cause adverse impacts if artifacts are displaced or soils temporarily exposed to erosion during decompaction or revegetation activities. Several archeological sites are at least partially within the East Valley campgrounds. Removal of campsites and associated infrastructure and subsequent restoration of native vegetation within the campground areas restoration actions would result in ground disturbing activities that may result in impacts if artifacts are displaced or soils temporarily exposed to erosion during decompaction or revegetation activities. Avoidance of known archeological sites is always the preference.

Construction of a pedestrian underpass and roundabout at the Village Drive/Northside Drive intersection is intended to address traffic congestion and pedestrian/vehicle conflicts. This is in the

vicinity of known resources. Consideration (and avoidance if possible) of resources will occur during the planning stages.

Alternative 4 also calls for removal of the Sugar Pine and Ahwahnee bridges and the pedestrian trail between them. A large archeological site is directly adjacent to (and likely beneath) the northern abutment of Sugar Pine Bridge. Removal of the Sugar Pine Bridge has the potential to cause an adverse effect on this archeological site. Other than this exception, no archeological resources have been recorded in the immediate vicinity of either the Sugar Pine or the Ahwahnee bridges, or the multiuse trail between these two bridges. Rerouting the trail to the north side of the river may result in the trail encroaching on one or more of the known archeological sites in the likely reroute area.

Alternative 4 would reroute 420 feet of the Valley Loop Trail, itself a known historic property, out of wetland areas through Slaughterhouse and Bridalveil meadows. For other areas of trail reroutes, planning would consider impacts on archeological resources, and be located away from known archeological sites to the extent practicable. Mitigation measures MM-AR-2 (and/or -3, see Appendix C) would be necessary if it is not possible to reroute the trail off of, or away from, archeological resources.

While inadvertent discovery of archeological resources is not necessarily an impact in and of itself, discovery can result in damage to sites through exposure of artifacts to erosion, collection, and displacement. Implementation of mitigation measure MM-AR-1 (see Appendix C) is recommended to reduce potential impacts associated with inadvertent discovery. Likewise, a program of intensive surface survey and/or limited subsurface testing (MM-AR-2) is recommended for actions that would take place within or near the boundaries of a known archeological resource. An appropriate treatment plan could then be developed to reduce potential impacts associated with ground disturbance through construction or restoration. With implementation of these two mitigation measures, under NHPA, the potential for adverse effects resulting from Alternative 4 actions to protect and enhance river values in Segment 2 would be reduced.

### *Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

Under Alternative 4, some campsites would be removed or relocated from Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds. Removal areas would be restored with native vegetation. New RV campsites would be constructed at the Upper Pines Loop addition, and more new campsites (walk-in, drive-in, and RV) would be constructed at the former Upper and Lower River campgrounds, an Upper Pines addition, the Curry Village stables area, and west of Yosemite Lodge. Various facilities associated with Yosemite Lodge would be removed, and new concessioner employee housing and parking would be constructed in areas close to known archeological sites. Overall, peak day visitor numbers to the Valley would be about the same as current rates.

New pedestrian undercrossings would be constructed at the Camp 6 intersection with Northside Drive and at the intersection of Yosemite Lodge Drive and Northside Drive. New parking would be provided west of Yosemite Lodge, and a formal shuttle stop would be constructed for Camp 4. Construction of pedestrian undercrossings would likely result in adverse impacts on known archeological resources from restoration, facilities demolition, removal, new construction, and other

ground disturbing activities. Unless avoidance is possible, this may result in local, long-term minor to major adverse impacts. Under NHPA, site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific. Mitigation measure MM-AR-1 for procedures in the event of inadvertent discovery and mitigation measure MM-AR-2 for testing, assessment, and treatment of known sites prior to ground disturbance may reduce the potential for, or avoid potential effects.

Under Alternative 4, replacement of removed sites at Backpackers Campground at a western extension of the campground and construction of new concessioner housing and parking near Yosemite Lodge would occur within or near known archeological sites in Segment 2. Likewise, construction of new campsites near the Curry Village stables and west of Yosemite Lodge would have the potential to encroach on known sites. All ground-disturbing activities associated with the creation of new campsites and facilities would have the potential to impact these sites.

New campsite construction at the former Upper and Lower River campgrounds would not affect known sites. An archeological resource is known to exist in the vicinity of the proposed Upper Pines Loop addition walk-in campground. Under NHPA, this site is not considered to be significant, and no historic property is affected. The site may still retain traditional cultural resource values under NEPA.

The numbers of day use and overnight visitors proposed under the Alternative 4 actions to manage visitor use and facilities in Segment 2 would not change enough from current levels to have a measureable impact on archeological resources. While visitor use can and does affect sites, effects are more dependent on local use specific to areas that contain one or more archeological resources.

Restoration of floodplain and other ecosystems in former campsites would potentially cause adverse effects on archeological sites during restoration activities. Implementation of mitigation measures MM-AR-2 (controlled subsurface testing and treatment plan) and/or MM-AR-3 (archeological monitoring) presented in Appendix C may reduce the potential adverse effects. Similarly, implementation of MM-AR-2 would reduce or avoid adverse effects associated with construction of new campsites and other facilities in the vicinity of known sites.

While inadvertent discovery of archeological resources is not necessarily an impact in and of itself, discovery can result in damage to sites through exposure of artifacts to erosion, collection, and displacement. Implementation of mitigation measure MM-AR-1 (see Appendix C) is recommended to reduce or reduce potential impacts associated with inadvertent discovery during construction of new campsites in the former Upper and Lower River campgrounds.

**Yosemite Lodge and Camp 4.** Proposed new parking spaces with Alternative 4 west of Yosemite Lodge and a formal shuttle stop at Camp 4 could encroach on known archeological sites, as could the proposed pedestrian undercrossing at Yosemite Lodge Drive. There are no known sites near the proposed Camp 6 intersection undercrossing.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions proposed under Alternative 4 to protect and enhance river values in Segments 3 and 4 would affect archeological resources beyond those actions common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, high-density employee housing and remote visitor parking would be constructed in the Abbeville and Trailer Village area in Segment 4. Proposed housing for 258 employees and parking for 200 vehicles would potentially be located on or near a known archeological site, and could result in impacts due to ground disturbance during construction. Avoidance of archeological sites is always the preferred action. If avoidance is not possible, mitigation measure MM-AR-2 (see Appendix C) describes the process of testing, assessment, and treatment that should be followed prior to beginning ground-disturbing activities within or near the known site boundary. Under NHPA, implementation of this measure would ensure that the potential for adverse effects from these actions would be reduced or avoided.

### **Segments 5, 6, 7 and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, two stock campsites would be removed from the Wawona stock camp (within a sensitive resource area). The Wawona Golf Course would not be removed under Alternative 4. Portions of several archeological sites are located within the Wawona Golf Course; the presence of golf course fill overlying cultural deposits may protect them. Continued use of the golf course would likely have a negligible impact on archeological resources.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, two stock campsites would be relocated to the Wawona stables area. Thirty-two campsites would be removed from the Wawona Campground, many in archeologically sensitive areas.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Several of the management actions proposed under Alternative 4 would have the potential to result in minor to major adverse impacts (NEPA) and adverse effects (NHPA) on known prehistoric and historic-era archeological resources through ground-disturbing actions related to restoration, construction, and facilities removal. These actions could result in short-term exposure of site soils to erosional forces, displacement of artifacts, and diminished integrity of horizontal and vertical site patterning. Mitigation measure MM-AR-2 (see Appendix C) would delineate the process by which a site could be tested and characterized, and an appropriate treatment plan developed. Mitigation measure MM-AR-3 (see Appendix C) would provide for an archeological monitor to be present for



minimally invasive construction and restoration ground-disturbing activities within sites. Under NHPA, these mitigation measures would reduce or avoid adverse effects. Mitigation measure MM-AR-1 (see Appendix C) describes the process by which any unanticipated discoveries would be handled so as to reduce or avoid disturbances to previously unknown sites.

A few of the management actions associated with Alternative 4 may result in long-term, beneficial impacts on known archeological sites, either through restrictions on types of visitor use that can cause damage to sites (camping), restoration of areas that have been the focus of inappropriate use (informal trails or recreational facilities), or stabilization of site surfaces through revegetation and other restorative actions. In some instances, actions that might ultimately benefit a resource also have the potential to adversely impact site elements.

### **Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

#### ***Past Actions***

Past actions listed in Appendix C included some manner of ground-disturbing activities (road construction, housing unit removal or construction, recontouring land for habitat restoration), were subject to federal regulations, including NEPA and section 106 of the NHPA. The 2008 programmatic agreement contains provisions for archeological survey, testing, monitoring, and data recovery prior to each project. Information learned during this process continues to inform the current body of knowledge about archeological resources at Yosemite. To date, several major archeological research projects have resulted from activities conducted for these actions, with at least two additional reports (Wahhoga and Crane Flat Utilities projects) in progress.

#### ***Present Actions***

The *Yosemite Fire Management Plan* and *Yosemite General Management Plan* contain provisions regarding proper treatment and recording of archeological resources; however, neither contains specific plans for archeological research. The *Programmatic Parkwide Yosemite Facelift Volunteer Event* (2011) resulted in categorical exclusions signifying that no significant environmental effects (including effects on cultural resources) has occurred or will occur.

#### ***Reasonably Foreseeable Future Actions***

By following the processes and provisions of federal regulations and internal documents (e.g., the 1999 and/or 2008 programmatic agreements, *Management Policies 2006*, and others), the park would identify archeological resources in any areas scheduled for ground-disturbing actions and provide worker education, monitoring, and/or subsurface testing to reduce potential adverse effects. If mitigation through these means is not feasible, park archeologists may consult with the ACHP to resolve adverse effects. With avoidance measures in place, many sites may still be adversely affected by facilities construction, especially in Yosemite Valley and El Portal. Beneficial impacts on individual sites may result from restoration of natural vegetation communities and resulting reduction of erosion, trampling, and other visitor use impacts.

***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

Many of the combined past, present, and reasonably foreseeable future actions would have a negligible or beneficial impact on archeological resources. For those actions with potential adverse impacts, implementation of all appropriate mitigation and consultation would reduce the potential for, or avoid those impacts.

***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

**All River Segments**

Table 9-250 summarizes proposed actions under Alternative 5, and potential impacts to archeological sites, and then offers analysis under NEPA and NHPA regulations.

***Impacts of Actions to Protect and Enhance River Values***

None of the proposed Alternative 5 actions to protect and enhance river values would have the potential to affect archeological resources beyond those actions common to Alternatives 2–6.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

None of the proposed Alternative 5 actions to manage visitor use and facilities would have the potential to affect archeological resources beyond those actions common to Alternatives 2–6.

**Segment 1: Merced River above Nevada Fall**

***Impacts of Actions to Protect and Enhance River Values***

There are no actions under Alternative 5 to protect and enhance river values in Segment 1 other than those actions common to Alternatives 2–6.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 5, some infrastructure would be removed at the Little Yosemite Valley Backpackers Campground, Merced Lake Backpackers Campground, and the Merced Lake High Sierra Camp. Bear boxes would be removed from both backpackers campgrounds and flush toilets would be replaced with composting ones at the Merced Lake Backpackers Camp, but other infrastructure and campground capacities would remain the same as current conditions. Capacity at Merced Lake High Sierra Camp would be reduced to 42 beds per night, and the flush toilets and wastewater treatment system would be removed and replaced with composting toilets. No limits would be placed on the number of hikers on the trail between Little Yosemite Valley and Merced Lake.

**TABLE 9-250: IMPACTS FROM ALTERNATIVE 5 ACTIONS**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
All segments	Actions to Protect and Enhance River Values	None of the overall actions to protect and enhance river values in all river segments would affect archeological resources beyond those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
All segments	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	None of the overall actions in any of the river segments to manage visitor use and facilities would affect archeological resources beyond except those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
Segment 1	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segment 1 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
<b>Biological Resource Actions</b>			
Segment 1	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Remove some infrastructure at Little Yosemite Valley Backpackers Campground, Merced Lake Backpackers Campground, Merced Lake High Sierra Camp  Reduce capacity at Merced Lake High Sierra Camp	<i>NEPA</i> : Proposed reduction of camping at Merced Lake High Sierra Camp would have a negligible impact on archeological sites in the area. Ground disturbing activities associated with removal of infrastructure may result in local, long-term, minor to moderate adverse impacts on known archeological sites, if avoidance is not possible.  <i>NHPA</i> : There are no NHRP listed, or sites determines to be eligible for the NRHP in Segment 1. No historic properties are affected.
Segment 2	Actions to Protect and Enhance River Values	Conduct limited habitat restoration actions within the East Valley campground floodplains  Redesign of Curry Orchard parking lot and associated infrastructure  Removal of some East Valley campground sites, with restoration  Remove Sugar Pine Bridge and reroute trail that currently extends between these bridges  Reroute portions of the Valley Loop Trail out of the meadow  Archeological sites would be considered in planning and avoided when possible	<i>NEPA</i> : In areas where no archeological resources have been recorded such as Curry Orchard parking Lot), there would be a negligible impact on archeological properties.  Proposed removal of campsites and associated infrastructure within the East Valley campgrounds would potentially result in a local, long-term beneficial impact on the known archeological sites found within the campgrounds.  Removing the northern abutment of Sugar Pine Bridge would result in a local, long-term major adverse impact to the known archeological site.  Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas and areas of floodplains, and rerouting of the trail between bridges may result in local, long-term, minor to moderate adverse impacts from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity, if site avoidance is not possible.  Ground disturbance and rerouting of the Valley Loop Trail would result in a local, long-term major adverse effect, as this trail is itself an historic property.

**TABLE 9-250: IMPACTS FROM ALTERNATIVE 5 ACTIONS CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Actions cont.)</b>			
Segment 2 (cont.)			<p><i>NHPA:</i> Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific, when avoidance is not possible.</p> <p>Removal of the Sugar Pine Bridge has the potential to cause an adverse effect on an archeological resource. Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas and areas of floodplains, and rerouting of the trail between bridges may also potentially result in adverse effects. Rerouting of the Valley Loop Trail would result in an adverse effect. Mitigation measures may reduce the potential for adverse effects.</p>
<b>Programmatic Resource Actions</b>			
Segment 2	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Remove and/or relocate some campsites from Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds</p> <p>Restore areas with native vegetation</p> <p>Create new campsites at the Upper River Campground, Upper Pines (additional RV sites)</p> <p>Construct new concessioner employee housing and parking areas</p> <p>Construct new parking west of Yosemite Lodge</p> <p>Move Camp 6 north from the river and formalize Camp 6/Village Center Parking</p> <p>Construct a pedestrian underpass and roundabout at the Village Drive/Northside Drive intersection, as well as a roundabout in the same vicinity</p> <p>Construct a shuttle stop for Camp 4</p> <p>Archeological sites would be considered in planning and avoided when possible</p>	<p><i>NEPA:</i> General reduction in focused visitor use at areas on or near known archeological resources would potentially result in a local, long-term beneficial impact.</p> <p>Adverse impacts on known archeological resources from restoration, facilities demolition, removal, new construction, and other ground disturbing activities would potentially occur during active ground disturbance. Unless avoidance is possible, this may result in local, long-term minor to moderate adverse impacts.</p> <p><i>NHPA:</i> Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific.</p>

**TABLE 9-250: IMPACTS FROM ALTERNATIVE 5 ACTIONS CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Programmatic Resource Actions cont.)</b>			
Segments 3 and 4	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segments 3 and 4 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
Segments 3 and 4	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Construction of high-density employee housing and remote visitor parking in Abbieville and Trailer Village Archeological sites would be considered in planning and avoided when possible	<i>NEPA</i> : Ground disturbing may occur in or near known archeological sites during these actions; impacts would be local, long-term, minor to moderate, and adverse. <i>NHPA</i> : As actions are within or near a known archeological site, there is an adverse effect, unless avoidance is possible.
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Remove two stock campsites from Wawona stock camp Relocate campsites to Wawona maintenance area Archeological sites would be considered in planning and avoided when possible	<i>NEPA</i> : Actions to remove two stock campsites from near known archeological sites would result in local, long-term, beneficial impacts by stabilizing elements of archeological features and preventing future disturbances. <i>NHPA</i> : Given the concentration of archeological resources in the vicinity of Wawona maintenance area, there is a likely potential for adverse effects, unless avoidance is possible.
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Remove two stock campsites from Wawona stock camp Remove some campsites in Wawona Campground Archeological sites would be considered in planning and avoided when possible	<i>NEPA</i> : Relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas, by redirecting visitors away from sensitive areas. Ground disturbing activities may occur in or near known archeological site during these actions; impacts would be local, minor to moderate, and potentially adverse, if site avoidance is not possible. <i>NHPA</i> : As actions are within or near a known archeological site, there is an adverse effect, unless avoidance is possible.

Removal of permanent infrastructure at the Little Yosemite Valley Backpackers Campground and Merced Lake High Sierra Camp may have the potential to disturb subsurface cultural materials of known archeological sites. Avoidance of archeological sites is always preferred (even if the sites have not been formally evaluated, or determined to be ineligible for the NRHP, as they may have traditional cultural values outside of criterion D). If impractical to avoid, archeological monitoring (mitigation measure MM-AR-3, see Appendix C) is recommended during ground disturbing activities.

No archeological sites are known to exist in the immediate vicinity of the Merced Lake Backpackers Campground. The slight reduction in facilities and camping capacity would likely not result in any impact on cultural resources.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Some restoration of East Valley campground floodplains and other sensitive habitats would occur under Alternative 5. Hydrologic function of Stoneman Meadow would be improved through redesign of the Curry Orchard Parking Area and associated infrastructure. Removal of some East Valley campground sites would result in restoration of these areas. Sugar Pine Bridge would be removed and the multiuse trail rerouted to the north.

Actions to reroute sections of the Valley Loop Trail would be the same as described for Alternative 2. Limited floodplain restoration under Alternative 5 means there would likely be fewer impacts to archeological sites during ground-disturbing activities. The proposed rerouting of the multiuse trail with Alternative 5 may disturb known archeological sites, unless avoidance is possible. Under NHPA, implementation of mitigation measures MM-AR-2 (Appendix C) for restoration and trail reroute may reduce the potential for, or avoid adverse effects.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 5, facilities would be removed from the Yosemite Lodge area, and some concessioner's housing and parking. Some campsites would be removed from Backpackers, Lower Pines, and North Pines campgrounds, as well as two sites from Upper Pines Campground. Sixteen replacement sites would be constructed at the Backpackers Campground western extension. New camping at the former Upper River Campground, Upper Pines Loop (additional RV sites), and Upper Pines walk-in addition would also be created. Under Alternative 5, day use capacity would accommodate nearly all the current peak day use in Segment 2, accommodating more overnight visitors.

Pedestrian undercrossings would be constructed at Yosemite Lodge Drive and Camp 6 intersections with Northside Drive, and a shuttle stop would be constructed for Camp 4. Construction of the pedestrian undercrossing at Yosemite Lodge Drive would likely result in adverse impacts on known archeological resources from restoration, facilities demolition, removal, new construction, and other ground disturbing activities. Unless avoidance is possible, this may result in local, long-term minor to major adverse impacts. Under NHPA, site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific. Ground disturbing activities may likely result in

adverse effects. Mitigation measure MM-AR-1 for procedures in the event of inadvertent discovery and mitigation measure MM-AR-2 for testing, assessment, and treatment of known sites prior to ground disturbance may reduce the potential for, or avoid potential effects.

The reduction in campsite removal and habitat restoration proposed at the East Valley campgrounds would result in some lessening visitor use impacts on known sites in those areas. There may be potential impacts from ground disturbances associated with soil decompaction and revegetation. Under NHPA, mitigation measure MM-AR-1 for procedures in the event of inadvertent discovery and mitigation measure MM-AR-2 for testing, assessment, and treatment of known sites prior to ground disturbance may reduce the potential for or avoid potential effects.

The numbers of day use and overnight visitors proposed under Alternative 5 to manage visitor use and facilities in Segment 2 would not change from current levels enough to have a measureable impact on archeological resources. While visitor use can and does impact sites, effects are much more dependent on local use specific to areas that contain one or more archeological resources.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions proposed under Alternative 5 to protect and enhance river values in Segments 3 and 4 would affect archeological resources beyond those actions common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 5, high-density employee housing and remote visitor parking would be constructed in the Abbeville and Trailer Village area in Segment 4. Proposed housing for 258 employees and parking for 200 vehicles would potentially occur on or near a known archeological site, resulting in an adverse impact (NEPA) and adverse effect (NHPA). Under NHPA, if avoidance is not possible, mitigation measure MM-AR-2 (see Appendix C) describes the process of testing, assessment, and treatment that should be followed prior to beginning ground-disturbing activities within or near the known site boundary. Implementation of this measure may reduce the potential for adverse effects.

### **Segments 5, 6, 7 and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Two stock campsites would be removed from the Wawona stock camp (within a sensitive resource area). These campsites would be relocated to the Wawona Maintenance area where no archeological sites are known to occur) instead of the Wawona stables. This would result in a long-term beneficial impact.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

As above, the two campsites removed from the Wawona stock camp would be relocated to the Wawona Maintenance area. Some campsites would be removed from the Wawona Campground. Ground disturbing activities may occur in or near known archeological site during these actions. Under NHPA, site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific. Mitigation measure MM-AR-1 for procedures in the event of inadvertent discovery and mitigation measure MM-AR-2 for testing, assessment, and treatment of known sites prior to ground disturbance may reduce the potential for, or avoid potential effects.

**Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Several of the management actions proposed under Alternative 5 have the potential to result in minor to major impacts on known prehistoric and historic-era archeological resources through ground-disturbing actions related to restoration, construction, and facilities removal. These could result in short-term exposure of site soils to erosional forces, displacement of artifacts, and diminished integrity of horizontal and vertical site patterning. Mitigation measure MM-AR-2 (see Appendix C) would delineate the process by which a site could be tested, characterized, and an appropriate treatment plan developed, assuming site avoidance is not possible. Mitigation measure MM-AR-3 (see Appendix C) would provide for an archeological monitor to be present for minimally invasive construction and restoration. Mitigation measure MM-AR-1 (see Appendix C) describes the process by which any unanticipated discoveries would be handled so as to reduce or avoid disturbances to previously unknown sites.

A few of the Alternative 5 management actions would result in long-term, beneficial impacts on known archeological sites, either through restrictions on types of visitor use that can cause damage to sites (camping), restoration of areas that have been the focus of inappropriate use (informal trails or recreational facilities), or stabilization of site surfaces through revegetation and other restorative actions. In some instances, actions that may ultimately benefit a resource also have the potential to adversely impact site. Appropriate mitigation recommendations are addressed above.

**Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration*****Past Actions***

Past actions listed in Appendix C included some manner of ground-disturbing activities (road construction, housing unit removal or construction, recontouring land for habitat restoration), were subject to federal regulations, including NEPA and section 106 of the NHPA. The 2008 programmatic agreement contains provisions for archeological survey, testing, monitoring, and data recovery prior to each project. Information learned during this process continues to inform the current body of knowledge about archeological resources at Yosemite. To date, several major archeological research projects have resulted from activities conducted for these actions, with at least two additional reports (Wahhoga and Crane Flat Utilities projects) in progress.



### ***Present Actions***

The *Yosemite Fire Management Plan* and *Yosemite General Management Plan* contain provisions regarding proper treatment and recording of archeological resources; however, neither contains specific plans for archeological research. In addition to the *Yosemite Fire Management Plan*, the *Programmatic Parkwide Yosemite Facelift Volunteer Event* (2011) resulted in categorical exclusions signifying that no significant environmental effects including effects on cultural resources) has occurred or will occur.

### ***Reasonably Foreseeable Future Actions***

By following the processes and provisions of federal regulations and internal documents (e.g., the 1999 and/or 2008 programmatic agreements, *2006 Management Policies*, and others), the park would identify archeological resources in any areas scheduled for ground-disturbing actions and provide worker education, monitoring, and/or subsurface testing to reduce potential adverse effects under NHPA. If mitigation through these means is not feasible, park archeologists may consult with the ACHP to resolve adverse effects. With avoidance measures in places, many sites may still be adversely affected by facilities construction, especially in Yosemite Valley and El Portal.

Beneficial impacts on individual sites may result from restoration of natural vegetation communities and resulting reduction of erosion, trampling, and other visitor use impacts.

### ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

Many of the combined past, present, and reasonably foreseeable future actions may have a beneficial impact on archeological resources. Following NHPA regulations, implementation of all appropriate mitigation and consultation actions may reduce or avoid potential adverse effects.

### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

#### **All River Segments**

Table 9-251 summarizes proposed actions under Alternative 6, and potential impacts to archeological sites, and then offers analysis under NEPA and NHPA regulations.

#### ***Impacts of Actions to Protect and Enhance River Values***

Beyond those actions common to Alternatives 2–6, none of the proposed Alternative 6 actions to protect and enhance river values would have the potential to affect archeological resources.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Beyond those actions common to Alternatives 2–6, none of the proposed Alternative 6 actions to manage visitor use and facilities would have the potential to affect archeological resources.

**TABLE 9-251: IMPACTS FROM ALTERNATIVE 6 ACTIONS**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
All segments	Actions to Protect and Enhance River Values	None of the overall actions to protect and enhance river values in all river segments would affect archeological resources beyond those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
All segments	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	None of the overall actions in any of the river segments to manage visitor use and facilities would affect archeological resources beyond except those actions common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
Segment 1	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segment 1 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
<b>Biological Resource Actions</b>			
Segment 1	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Remove some infrastructure at Little Yosemite Valley Backpackers Campground, Merced Lake Backpackers Campground, Merced Lake High Sierra Camp</p> <p>Reduce some capacity at Merced Lake High Sierra Camp</p> <p>Archeological sites would be considered in planning and avoided when possible</p>	<p><i>NEPA</i>: Proposed reduction of camping at Merced Lake High Sierra Camp would have a negligible impact on archeological sites in the area.</p> <p>Ground disturbing activities associated with removal of infrastructure may result in local, long-term, minor, adverse impacts on known archeological sites, if avoidance is not possible.</p> <p><i>NHPA</i>: There are no NRHP listed or eligible sites within Segment 1. No historic properties are affected.</p>
Segment 2	Actions to Protect and Enhance River Values	<p>Conduct limited habitat restoration actions within the East Valley campground floodplains</p> <p>Redesign of Curry Orchard parking lot and associated infrastructure</p> <p>Removal of some East Valley campground sites, with restoration</p> <p>Reroute portions of the Valley Loop Trail out of the meadow</p> <p>Archeological sites would be considered in planning and avoided when possible</p>	<p><i>NEPA</i>: In areas where no archeological resources have been recorded (such as Curry Orchard parking Lot), there is a negligible impact.</p> <p>Proposed removal of campsites and associated infrastructure within the East Valley campgrounds would potentially result in a local, long-term beneficial impact on the known archeological sites found within the campgrounds, by redirecting visitor use.</p> <p>Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas and areas of floodplains may result in local, long-term, minor adverse effects from artifact displacement, exposure to erosion, and loss of vertical and horizontal site integrity, if site avoidance is not possible.</p> <p>Ground disturbance and rerouting of the Valley Loop Trail would result in a local, long-term major adverse impact, as this trail is itself an historic property.</p>

**TABLE 9-251: IMPACTS FROM ALTERNATIVE 6 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Biological Resource Actions (cont.)</b>			
Segment 2 (cont.)			<p><i>NHPA</i>: Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific.</p> <p>There is an adverse effect to the Valley Loop Trail. Mitigation measures may reduce this effect.</p>
<b>Programmatic Resource Action</b>			
Segment 2	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	<p>Remove and/or relocate some campsites from Backpackers, Lower Pines, North Pines, and Upper Pines campgrounds</p> <p>Remove buildings in the Yosemite Lodge floodplain, and facilities in Housekeeping Camp</p> <p>Restore areas with native vegetation</p> <p>Create new campsites at the Upper and Lower River campgrounds, Upper Pines (additional RV sites)</p> <p>Construct new concessioner employee housing and parking areas</p> <p>Construct new parking west of Yosemite Lodge</p> <p>Construct new RV campsites west of Yosemite Lodge</p> <p>Construct a pedestrian underpass and roundabout at the Village Drive/Northside Drive intersection</p> <p>Construct a shuttle stop for Camp 4</p> <p>Construct three-way intersection and a roundabout at the intersection with Northside Drive</p> <p>Move Camp 6 north from river and formalize Camp 6/Village Center Parking Area</p> <p>Archeological sites would be considered in planning and avoided when possible</p>	<p><i>NEPA</i>: Reduction in campsite visitor use at areas on or near known archeological resources would potentially result in local, long-term beneficial impacts, by redirecting visitor use away from sensitive areas, although this impact could also be negligible.</p> <p>Impacts on known archeological resources from restoration, facilities demolition, removal, new construction, and other ground disturbing activities would potentially occur during active ground disturbance. Unless avoidance is possible, this may result in local, long-term minor to moderate adverse impacts.</p> <p><i>NHPA</i>: Site specific measures would be developed to avoid adverse effects when possible. Determination of effects is site specific.</p>

**TABLE 9-251: IMPACTS FROM ALTERNATIVE 6 ACTIONS (CONTINUED)**

Segment	Action Type	Proposed Actions	Analysis under NEPA/NHPA
<b>Programmatic Resource Action cont.)</b>			
Segments 3 and 4	Actions to Protect and Enhance River Values	No proposed actions to protect and enhance river values in Segments 3 and 4 beyond those actions that are common to Alternatives 2–6.	Discussed in table 9-253: Impacts from Actions Common to Alternatives 2–6
Segments 3 and 4	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Construction of more high-density employee housing and remote visitor parking in Abbieville and Trailer Village  Archeological sites would be considered in planning and avoided when possible	<i>NEPA</i> : Ground disturbing may occur in or near known or newly discovered archeological sites during these actions, impacts would be local, long-term, minor to moderate, and potentially adverse, in cases where avoidance is not possible.  <i>NHPA</i> : As actions are within or near a known archeological site, there is an adverse effect, unless avoidance is possible. Mitigation measures may reduce the potential for adverse effects.
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values	Remove two stock campsites from Wawona stock camp  Relocate sites to Wawona stables	<i>NEPA</i> : Actions to remove two stock campsites from near known archeological sites would result in local, long-term beneficial impacts by stabilizing elements of archeological features and preventing future disturbances.  <i>NHPA</i> : These actions do not appear to affect historic properties.
Segments 5, 6, 7, and 8	Actions to Protect and Enhance River Values and Manage Visitor Use and Facilities	Remove two stock campsites from Wawona stock camp  Remove some campsites in Wawona Campground	<i>NEPA</i> : Relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas.  Ground disturbing may occur in or near known archeological site during these actions; impacts would be local, long-term, minor to moderate, and potentially adverse, in cases where avoidance is not possible.  <i>NHPA</i> : As actions are within or near a known archeological site, there is an adverse effect to historic properties, unless avoidance is possible.

## **Segment 1: Merced River above Nevada Fall**

### ***Impacts of Actions to Protect and Enhance River Values***

No actions to protect and enhance river values are proposed for Segment 1 under Alternative 6 beyond those actions common to Alternatives 2–6.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

The proposed Alternative 6 actions to manage visitor use and facilities would retain 60 beds at the Merced Lake High Sierra Camp.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Both Sugar Pine and Ahwahnee bridges would remain in place and the multiuse trail between these bridges would not be rerouted. Therefore, there would be no potential for an impact on a known archeological site north of the road. All other potential impacts are a result of actions to protect and enhance river values in Segment 2; recommended mitigation measures would be identical to those described for Alternative 5.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Actions related to campsite removal and relocation in the East Valley campgrounds, new campsites and parking, new concessioner's housing and parking, and construction of a pedestrian undercrossing and a shuttle stop at Camp 4 would be identical to those described for Alternative 5. Construction of 20 new RV campsites west of the Yosemite Lodge parking lot would occur as with Alternative 4. Each of these actions would have the potential to impact archeological sites.

Actions unique to Alternative 6 in Segment 2 would include the construction of a roundabout at the Camp 6 intersection with Northside Drive as well as the previously described pedestrian undercrossing. Another roundabout would be constructed at the intersection of Sentinel Drive and Southside Drive. Each of the proposed roundabouts would be located within or near known archeological sites, and consequently would have the potential to impact subsurface cultural deposits during ground-disturbing construction activities. Implementation of mitigation measure MM-AR-2 (see Appendix C) would result in site testing, assessment, and development of an appropriate treatment plan prior to construction, and may reduce potential adverse effects, unless site avoidance is possible.

The numbers of day use and overnight visitors proposed in Segment 2 under Alternative 6 would be the highest of Alternatives 2–6, and accommodate current peak day visitor parking and allow for annual growth of 3%. While visitor use can and does affect archeological resources, effects are much more dependent on local use specific to areas that contain one or more archeological resources. A steady increase in the rate of visitor use would not necessarily result in more impacts to individual sites.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

No actions proposed under Alternative 6 to protect and enhance river values in Segments 3 and 4 would affect archeological resources beyond those actions common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 6, proposed high-density housing would be developed to accommodate as many as 405 employees in the Abbieville and Trailer Village area in Segment 4. Remote visitor parking would also be constructed in this area. Construction of these facilities could result in an impact to a known archeological resource that exists in this area. Implementation of mitigation measure MM-AR-2 (see Appendix C) would provide a process for site testing, evaluating, and developing an appropriate treatment plan prior to ground-disturbing activity. Following NHPA regulations, if avoidance is not possible, mitigation measures may reduce the potential adverse effects associated with Alternative 6 actions to manage visitor use and facilities.

### **Segments 5, 6, 7 and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Actions that would have the potential to affect archeological resources in Segments 5–8 under Alternative 6 would be the same as those described for Alternative 4. Removal of two stock camp sites from the sensitive resource that is located near the Wawona stock camp may reduce the potential for impacts.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 6, two stock campsites would be relocated to the Wawona stables, and 13 campsites would be removed. No other actions, other than those common to Alternatives 2–6, would have the potential to affect cultural resources in Segments 5–8.

### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Several of the management actions proposed under Alternative 6 would have the potential to result in minor to moderate impacts on known prehistoric and historic-era archeological resources through ground-disturbing actions related to restoration, construction, and facilities removal. These could result in exposure of site soils to erosional forces, displacement of artifacts, and diminished integrity of horizontal and vertical site patterning. Mitigation measure MM-AR-2 (see Appendix C) would delineate the process by which a site could be tested, characterized, and an appropriate treatment plan developed, whenever site avoidance is not possible. Mitigation measure MM-AR-3 (see Appendix C) would provide for an archeological monitor to be present for minimally invasive construction and restoration ground-disturbing activities within sites. Mitigation measure MM-AR-1 (see Appendix C)

describes the process by which any unanticipated discoveries would be handled so as to minimize disturbances to previously unknown sites. Following NHPA regulations, these measures may reduce the adverse effects of relevant actions.

A few of the management actions associated with Alternative 6 would result in long-term, beneficial impacts on known archeological sites, either through reductions of types of visitor use that can cause damage to sites (camping), restoration of areas that have been the focus of inappropriate use (informal trails or recreational facilities), or stabilization of site surfaces through revegetation and other restorative actions. In some instances, actions that may ultimately benefit a resource also have the potential to adversely impact site elements.

### **Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

#### ***Past Actions***

Past actions listed in Appendix C included some manner of ground-disturbing activities (road construction, housing unit removal or construction, recontouring land for habitat restoration), were subject to federal regulations, including NEPA and section 106 of the NHPA. The 2008 programmatic agreement contains provisions for archeological survey, testing, monitoring, and data recovery prior to each project. Information learned during this process continues to inform the current body of knowledge about archeological resources at Yosemite. To date, several major archeological research projects have resulted from activities conducted for these actions, with at least two additional reports (Wahhoga and Crane Flat Utilities projects) in progress.

#### ***Present Actions***

The *Yosemite Fire Management Plan* contains provisions regarding proper treatment and recording of archeological resources; however, this plan does not contain specific plans for archeological research. The *Programmatic Parkwide Yosemite Facelift Volunteer Event* (2011) resulted in categorical exclusions signifying that no significant environmental effects including effects on cultural resources) has occurred or will occur.

#### ***Reasonably Foreseeable Future Actions***

By following the processes and provisions of federal regulations and internal documents e.g., the 1999 and/or 2008 programmatic agreements, *2006 Management Policies*, and others), the park would identify archeological resources in any areas scheduled for ground-disturbing actions and provide worker education, monitoring, and/or subsurface testing to reduce potential impacts to a negligible level. If mitigation through these means is not feasible, park archeologists may consult with the ACHP to resolve adverse effects. With avoidance measures in places, many sites may still be adversely affected by facilities construction, especially in Yosemite Valley and El Portal. Beneficial impacts on individual sites may result from restoration of natural vegetation communities and resulting reduction of erosion, trampling, and other visitor use impacts.

***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

Many of the combined past, present, and reasonably foreseeable future actions would have a negligible or beneficial impact on archeological resources. For those actions with potential adverse impacts, implementation of all appropriate mitigation and consultation would reduce or avoid those impacts.



## **American Indian Traditional Cultural Resources**

American Indian traditional cultural resources within the Merced Wild and Scenic River corridor include ethnohistoric village sites, traditional use plant population areas, sites of spiritual significance, archeological sites, and areas with other important qualities or uses for traditionally associated American Indians. The National Register of Historic Places (NRHP, or National Register) includes a process for formalizing and recording traditional cultural resources as Traditional Cultural Properties (TCPs). To date, within the MRP area no TCPs have been nominated to or listed in the National Register. Traditional resources have value beyond those defined within the National Register.

Resources that do not meet the National Register criteria may qualify as significant ethnographic resources under NEPA and the NPS 2006 Management Policies. As examples, traditional use plant population areas, geographic features important in stories and songs, archeological sites valued for reasons other than data potential, or other locations of sacred or cultural importance often do not fit typical definitions of National Register status. For this reason, analysis below focuses on NEPA compliance methodology. The park works with culturally associated American Indian tribes and groups to identify such resources and protect those characteristics that convey their cultural significance, regardless of National Register status.

Three areas in particular stand out for their association with traditional cultural resources: Yosemite Valley National Register District, Wawona Archeological District, and the El Portal Archeological District. In discussion of its significance, the 1976 National Register nomination of the Yosemite Valley National Register District noted “The remains of past Indian occupation have significance for archeological and environmental research, evidence of a unique tie and a native ethnic population, and value for interpretation in the Park” (emphasis added). While this “unique tie” has not been formalized, the intent of recognition of values beyond data potential is apparent. Similarly, the 1978 National Register nominations of the Wawona Archeological District and El Portal Archeological District note that the areas are known and recognized based on archeological and ethnographic research and resources.

The park has ongoing consultations with American Indian tribes and groups – including the Bishop Paiute Tribe, Mono Lake Kutzadika, American Indian Council of Mariposa County (AICMC), Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk, Bridgeport Indian Colony, and North Fork Rancheria of Mono Indians – to identify such resources and protect those characteristics that convey their cultural significance. Throughout this document, consultation is recommended to solicit American Indians’ input on specific plan designs, as well as development of interpretive, education, and outreach material. In many instances, monitoring by American Indian representatives of proposed actions would likely be required. Text below identifies general areas that may be impacted by MRP actions. Appendix J provides more specific detail, as much of the information about traditional cultural resources is considered to be confidential.

## *Affected Environment*

Numerous federal laws, statutes, and regulations have been enacted to protect the country's cultural heritage. The most applicable regulations to the proposed undertaking are summarized below. In addition, NPS has several internal policies, also listed here.

### **Regulations and Policies**

*Section 106 of National Historic Preservation Act 1966 (as amended).* Section 106 of the National Historic Preservation Act of 1966 (NHPA) (16 USC 470) directs federal agencies to take into account the effects of any undertaking on properties listed in or eligible for listing in the NRHP. The Advisory Council on Historic Preservation (ACHP) has developed implementing regulations (36 CFR 800), which allow agencies to develop agreements for consideration of these historic properties.

Prior to implementing an “undertaking” (i.e., “a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval”), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties and to afford the ACHP and the State Historic Preservation Officer (SHPO) a reasonable opportunity to comment on any undertaking that would potentially affect properties listed or eligible for listing in the National Register. Section 101(d)(6)(B) of the act requires the agency official to consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by an undertaking. The lead federal agency is responsible for project compliance with sections 101 and 106 of the NHPA.

*Cultural Resources Management Plan (1973).* The Cultural Resources Management Plan completed for the Yosemite General Management Plan was designed to protect the significant cultural resources of the park through compliance with all cultural resource legislative, executive, and regulatory requirements. The Cultural Resources Management Plan provides specific policies to guide cultural resources management at Yosemite, including consultation, survey and evaluation, preservation/restoration/reuse, and documentation.

*Native American Graves Protection and Repatriation Act (1990, 5 USC 3001 et seq.).* This act provides for the protection and repatriation of Native American human remains and cultural items, and requires notification of the relevant Native American tribes and groups upon the intentional excavation or inadvertent discovery of human remains and other cultural items.

*American Indian Religious Freedom Act of 1979 (42 USC 1996).* This act preserves for American Indians and other indigenous groups the right to express traditional religious practices, including access to sites under federal jurisdiction. Yosemite National Park complies with this act by consulting with traditionally associated American Indian tribes and groups, working with them to support traditional religious events and practices to the maximum extent possible, and accommodating access to and ceremonial use of sites, within the constraints of law and policy.

*Executive Order 13007: Indian Sacred Sites* (1996). Executive Order 13007 directs federal agencies with statutory or administrative responsibility for the management of federal lands, to the extent practicable and permitted by law, to accommodate access to and ceremonial use of Indian sacred sites by American Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites.

*1999 Programmatic Agreement.* Yosemite National Park, in consultation with the ACHP, the California SHPO, American Indian tribes, and the public, has developed a programmatic agreement for planning, design, construction, operations, and maintenance activities. This programmatic agreement provides a process for compliance with NHPA and includes stipulations for identification, evaluation, treatment, and mitigation of adverse effects for actions affecting historic properties, including potentially eligible historic properties. Under the 1999 PA, the park is obligated to “make every reasonable effort to avoid adverse effects to Historic Properties . . . through project design, facilities’ location, or other means. Avoidance alternatives will be documented during the NEPA process.” The park will follow stipulations of this programmatic agreement for all future planning and design projects. This programmatic agreement expires in 2014, and if a new programmatic agreement is not completed, the 2008 nationwide programmatic agreement in conjunction with standard compliance under 36 CFR 800 will provide guidance for park activities.

*2008 Programmatic Agreement.* This programmatic agreement provides nationwide coordination between the NPS, the ACHP, and the National Conference of SHPOs for the section 106 compliance process. The NHPA, 36 CFR 800, and the programmatic agreement provide the NPS with a roadmap to plan for and carry out undertakings to minimize harm to cultural resources.

*Proposed Merced River Plan Programmatic Agreement.* As a part of the current Merced Wild and Scenic River Comprehensive Management Plan, the Park is proposing, via consultation with the ACHP, OHP, and traditionally associated American Indian tribes and groups, the development of a programmatic agreement regarding treatment of historic resources under the proposed management plan (Merced River PA). This document, while not yet finalized, will provide guidance for the identification, evaluation, treatment, and mitigation of adverse effects for actions affecting historic properties impacted by all future planning and design projects of the Merced River Plan. One of the primary alterations in approaches as a result of this new programmatic agreement is that data recovery of archaeological sites is acknowledged as a way of minimizing adverse effects, but also requires that tribal consultation be incorporated into the process. This recognizes that traditionally associated tribes have values assigned to archaeological sites beyond their potential for data and information.

*Director’s Order 28 Cultural Resources Management Guideline* (1998). Director’s Order 28 guides the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the *NPS Management Policies*. It also ensures that the NPS comply with the substantive and procedural requirements described in the Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation. Additionally, the NPS will comply with the 2008 programmatic agreement with the ACHP and the National Conference of SHPOs. The NPS published the *2006 Management Policies* relating to the systemwide treatment of various types of resources on NPS lands. The following are some specific policies related to resources of the types discussed in the Director’s Order; other sections within the *Management Policies* describe the processes for consultation with traditionally associated peoples:

**5.3.5 Treatment of Cultural Resources.** The NPS will provide for the long-term preservation of, public access to, and appreciation of the features, materials, and qualities contributing to the significance of cultural resources. With some differences by type, cultural resources are subject to several basic treatments, including (1) preservation in their existing states; (2) rehabilitation to serve contemporary uses consistent with their integrity and character; and (3) restoration to earlier appearances by the removal of later additions and replacement of missing elements.

**5.3.5.1 Archeological Resources.** Archeological resources will be managed in situ, unless the removal of artifacts or physical disturbance is justified by research, consultation, preservation, protection, or interpretive requirements. Preservation treatments will include proactive measures that protect resources from vandalism and looting, and will maintain or improve their condition by limiting damage due to natural and human agents

**5.3.5.2 Cultural Landscapes.** Treatment decisions will be based on a cultural landscape's historical significance over time, existing conditions, and use. Treatment decisions will consider both the natural and built characteristics and features of a landscape, the dynamics inherent in natural processes and continued use, and the concerns of traditionally associated peoples. The treatment implemented will be based on sound preservation practices to enable long-term preservation of a resource's historic features, qualities, and materials. There are three types of treatment for extant cultural landscapes: preservation, rehabilitation, and restoration.

**5.3.5.3 Ethnographic Resources.** Park ethnographic resources are the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated with a park for two or more generations (40 years), and whose interests in the park's resources began before the park's establishment. Living peoples of many cultural backgrounds—American Indians, Inuit (Eskimos), Native Hawaiians, African Americans, Hispanics, Chinese Americans, Euro-Americans, and farmers, ranchers, and fishermen—may have a traditional association with a particular park.

*Executive Order 11593: Protection and Enhancement of the Cultural Environment.* Executive Order 11593 instructs all federal agencies to support the preservation of cultural properties. It directs them to identify and nominate cultural properties in Yosemite to the NRHP and to “exercise caution... to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered” (NPS 1971).

## Scope of the Analysis

This section addresses American Indian traditional cultural resources and places for traditional practices and provides some background on ethnographic considerations. Traditional cultural resources are those that are part of the collective use or knowledge of a place. Resources can include those used either by a community or by an individual for traditional activities, including traditional plant use, ceremony, and teaching; these may or may not have been used ancestrally. Some of the places considered are archeological sites and ethnographic villages, while others are places in stories and discussed in oral histories, and still others are places where material items were/are acquired, or where ceremonies are conducted. One defining aspect of ethnographic resources is that they possess both historical and contemporary significance to the culture with which they are associated and are vitally important in maintaining the continuing cultural identity and traditions of the group (Parker and King 1998). This

section considers assessments of the existing condition and potential impacts on American Indian resources under NEPA. As an example, in his ethnographic evaluation of Yosemite Valley Brian Bibby (1994a:15) described plant uses and plant use areas that continue to be of special significance to traditionally associated American Indians. Bibby (1994a) especially highlighted the use of black acorn and mushrooms as food, wormwood for ceremonial use, and bracken fern, sedge roots, and deer grass for basketry. The Park also maintains a database with archeological sites and ethnographic resources identified as important to traditionally associated American Indian tribes and groups, found in various segments of the Merced River corridor (YNP 2010).

### ***All River Segments – Importance as American Indian Traditional Cultural Resources***

Ethnographic resources in the Merced Wild and Scenic River corridor represent an interconnected web of locations and resources, with the river as the central thread. Some of the important associations include the water and springs that feed the river, ethnobotanically important plants, unique geological features that figure in traditional songs and stories, areas of solitude for conducting ceremonies, and vistas that are unchanged from long ago. American Indian groups assign strong spiritual value to the Merced River and Yosemite Valley, and attach names and stories to geologic and other features in the river corridor. Archeological sites related to American Indian occupation of the Merced River corridor are also culturally significant. While impacts on National Register defined “scientific values” of archeological resources are addressed in a separate section, impacts on the American Indian association and values of these same sites are discussed here.

Important ongoing cultural practices include the traditional use of important natural resources found within the river corridor, including plants and fungi for food, medicine, textiles, basketry, dyes and pigments, and ceremonial uses. These resources remain of special significance to traditionally associated American Indians, who have continued to use plants and other resources into the present (Anderson 2005). These plants have specific ethnobotanical uses and are in many cases found exclusively or primarily in the river-dependent meadows and marshes of Yosemite Valley (Heady and Zinke 1978).

Several locations within the Yosemite Valley and El Portal areas contain prehistoric sites that continued to be occupied into the 20th century. All but one ancient village site recorded by C. Hart Merriam in Yosemite Valley is also associated with archeological remains. Many locations of old villages are still known by name. Traditionally associated American Indians continue to live in and around the park, and many are employed by the NPS, the concessioner, or other local businesses. At least seven American Indian tribes and groups claim traditional associations with Yosemite. Individuals from these tribes and groups continue to maintain cultural associations with lands and resources in the park through cultural and religious practices.

### ***Environmental Consequences Methodology***

Formerly, methodology for assessing impacts to cultural resources identified by traditionally associated American Indians was based on stipulations of the 1999 PA. This included identifying areas and resources that could be impacted, identifying the extent and type of impacts (beneficial or adverse), and considering ways to avoid, reduce, or mitigate adverse impacts. NPS is currently developing a plan-specific programmatic agreement that more specifically addresses how tribal

consultation will be incorporated into the overall process. For the MRP, the Park has not yet conducted project-specific consultation for each of the proposed actions. As a result, assessment of impacts to traditional cultural resources in this document is preliminary, and subject to change.

The present analysis is intended to fulfill the largely parallel goals of the regulatory programs and plan specific programmatic agreement through the execution of five basic analytic phases:

1. The initial phase is the determination of the appropriate geographic extent or Area of Potential Effects (APE) of the analysis for the plan and for each alternative action under consideration.
2. The second phase is to produce (when possible) an inventory of traditional cultural resources in each such geographic area.
3. The third phase is to determine whether particular cultural resources in an inventory are significant, unless resources can be avoided by construction.
4. The fourth phase is to assess the character and the severity of the impacts of the plan and alternatives on the significant cultural resources that cannot be avoided in each respective inventory.
5. The final phase is to propose mitigation measures that would reduce or resolve significant impacts.

Through the study of geographic locales of potential areas of traditional cultural resources, researchers assess potential physical changes resulting from proposed plan actions. In instances of geographic overlap, both short-term and long-term impacts are estimated based on: the degree of physical change that would result from the action (e.g., minor disturbance from vegetation thinning, vs. moderate/major disturbance from building removal and grading or other earthwork); and the nature of the resource (i.e., traditional plant use area, ethnographic village site with archeological remains, spiritually significant locale, or other resource type).

In several instances, restoration or facilities-related actions would potentially restrict access to areas with traditional cultural resources during their construction or implementation phase, resulting in a short-term adverse impact, although the ultimate result of the action may be an improved condition for the resource (i.e., long-term beneficial impact).

For actions that would not result in physical changes to the resources, such as actions relating to visitor and facilities use management, the primary consideration with regard to impacts on traditional cultural resources is continued accessibility. Again, assessment of these impacts in this document is preliminary and subject to change as a result of the Park's extensive and plan-specific consultation that will be conducted with traditionally associated tribes and groups. In a few instances, actions proposed as part of the MRP are similar to those proposed previously as individual Park undertakings, and the Park has already consulted with traditionally associated American Indians regarding these actions. Although the Park will conduct additional consultation for these actions as part of the plan-specific programmatic agreement, results of preliminary consultation have been taken into account for the impact assessments in this section.

## NEPA Compliance Methodology

Some actions, such as meadow restoration, may have a beneficial impact on traditional cultural resources (in this example, by increasing the health and number of traditionally use plant areas). Adverse impacts on American Indian traditional cultural resources include damage, alteration, destruction, isolation, neglect, deterioration, limited accessibility, and other factors that may diminish the characteristics that make the place significant to the traditionally associated community. American Indian traditional cultural resources may also be impacted if the community's ability to access or use culturally significant resources or locations affects the way in which the community connects to the valued property. As an example, an increase in annual visitors to the park could increase visitor use and crowding at specific locations. This may result in impacts on the setting and feeling of culturally significant resources. This can include visual and aural intrusions as well as physical alterations. Analyses of impacts on American Indian traditional cultural resources for NEPA purposes are based on: context, intensity, duration, and type of impact.

**Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For this analysis, local impacts would be those that occur in a specific area within a segment of the Merced River. This analysis further identifies whether there would be local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area within Yosemite. Regional impacts would be those that extend to the Yosemite gateway region.

**Intensity.** The intensity of impact depends on the nature, location, and design of the proposed project. Intensity of impacts are described as:

- **Negligible.** Impact is barely perceptible and not measurable; confined to small areas of a particular site or ethnographic district.
- **Minor.** Impact is perceptible and measureable; remains localized and confined to a single area of a particular site or ethnographic district.
- **Moderate.** Impact is sufficient to cause a change in a character-defining feature; generally involves a single site or small group of sites within an ethnographic district.
- **Major.** Impact results in a substantial and highly noticeable change in character-defining features; involves a large area of one site, or larger areas with high to exceptional ethnographic value.

**Duration.** Impacts to traditional cultural resources are described as short-term or long-term duration.

**Type of Impact.** Impacts can be considered to either be adverse or beneficial, direct or indirect. Impacts are considered adverse when they have the potential to diminish significant characteristics of a resource. Specific actions, such as demolition, result in direct impacts. Indirect impacts generally occur after project completion, and result from changes in land use or pedestrian traffic patterns.

The assessment of impacts on traditional cultural resources requires knowledge of the specific qualities of the resource that are considered culturally valuable. For example, if a particular meadow is

valued for the species of medicinal plants that grow there, an increase or change in the amount of use of the meadow may not be an adverse impact as long as the plants are protected. If the same meadow is considered culturally significant, changes allowing increased visitor access/visitation or incompatible recreation activities would likely be considered adverse. Consequently, analysis of impacts on traditional cultural resources requires consultation with tribal governments, traditional cultural practitioners, and other traditionally associated American Indians.

Under NEPA, cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR § 1508.7). For traditional cultural resources, cumulative impacts are generally those that take place within a specified geographic area that contains similar or related resources. NEPA also requires a discussion of mitigation, and the appropriateness and effectiveness of mitigation. To best meet these requirements, ongoing tribal consultation over the life of the project will be critical, as well as adherence to the plan-specific programmatic agreement that is currently being developed.

American Indian traditional cultural resources in the Merced River corridor are qualitatively analyzed based on existing knowledge, and assessing what potential modifications could alter character-defining features. Actions specific to individual alternatives that would affect these historic properties are described under each alternative.

Appendix C contains mitigation measures that may reduce the potential for impacts, and contain provisions and requirements for consultation with traditionally associated cultural groups. Mitigation measure MM-AR-1 notes that National Register eligibility determinations, and potential impacts on prehistoric and ethnographic sites are determined in consultation with traditionally associated groups. This measure also contains provisions for appropriate protocols in the event that Native American remains are encountered. Mitigation Measure MM-AR-3 notes that the presence of Native American monitors may be appropriate during some ground disturbing activities, and consultation would occur prior to some ground-penetrating work such as excavation, trenching, drilling, or stump and root removal in culturally sensitive areas. This mitigation measure also notes appropriate protocol in the event that human remains are discovered.

### *Environmental Consequences of Alternative 1 (No Action)*

In this and following sections, impacts are summarized for different types of proposed management actions (including No Action) that would occur in each Wild and Scenic River segment. Many actions have been determined to have no impact on traditional cultural resources, typically because there is no geographic correlation between the action and any known ethnographic resources. In order to protect confidential resource data, ethnographic sites are not individually named nor are their exact locations relative to the management actions revealed.

The following discussion provides an overview of the types of impacts that could occur with regards to American Indian traditional cultural resources within the Merced River corridor from application of Alternative 1 (No Action). NPS recognizes that there may be National Register-eligible (but as yet not defined) TCPs within the study area, in all segments of the river corridor. Scientific data related to



archeological sites is addressed in “Archeological Resources” section earlier in this chapter. Archeological sites (currently listed, potentially eligible, and not-listed) may also have value for traditionally associated American Indians that have not yet been formalized; as such, these traditional values are not discussed with regard to NHPA. Resources that may qualify as significant resources under NEPA and NPS *2006 Management Policies* are primarily found in Yosemite Valley (Segment 2) and El Portal (Segment 4) (YNP 2010), and are discussed here.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

Traditionally associated American Indian communities continue to practice their spiritual ceremonies and conduct other traditional cultural practices in Yosemite as they have for thousands of years. The Valley is a traditional location for many seasonal ceremonies and events. Areas within Segment 2 are used for seasonal religious ceremonies and cultural gatherings, as well as life-cycle occasions such as weddings and funerals. Many of these events are held during the park’s peak visitation season, and require the use of the Yellow Pines group campground. Other important ongoing cultural practices include the traditional use of native plant species found within the meadows, riparian habitat, and black oak groves of the Valley.

Under Alternative 1 (No Action), management of ethnobotanical resources, access to traditional use plant populations and sacred sites, and culturally important views would remain unchanged from current conditions. No habitat restoration activities would be conducted in riparian or meadow areas, and no campsites or abandoned infrastructure and other facilities would be removed from known village sites and other archeological resources. No informal trails would be removed and restored in ethnographic sites, meaning that all park visitors could continue to access, and potentially damage, these resources through inappropriate use, trampling of ethnobotanically important plants, or artifact collection and vandalism. While many of the proposed restoration actions would have long-term, beneficial impacts on ethnographic resources that would not occur under Alternative 1, neither would there be a potential for adverse impacts associated with physical disturbance of resources and decreased access to important sites and traditional use plant population areas during restoration activities, which would also be possible under Alternatives 2–6.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Issues associated with Alternative 1 (No Action) are ongoing concerns by traditionally associated American Indians regarding maintenance of the populations of important native plant species, the decline in black oak seedling and sapling survival rates, unimpeded access to sacred sites or ceremonial locations (especially during peak visitor seasons), and protection of ethnohistoric village locations and archeological sites from visitor use impacts. Alternative 1 would provide no opportunities to improve populations of ethnobotanically important plants through removal of facilities or reductions in user capacity, nor would access to sacred sites and traditional use plant population areas be changed from the current, sometimes crowded, conditions.

## **Segment 4: El Portal**

### ***Impacts of Actions to Protect and Enhance River Values***

Segment 4 contains several locations along the Merced River that are known as traditional use areas for plants, notably those used in basketry. Traditionally associated American Indians and the NPS manage stands of redbud, willow, sourberry, and other materials for their use in woven baskets. Under Alternative 1 (No Action), no opportunities for increasing the populations and health of these species would occur.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Disruption of the habitat necessary to support ethnobotanical species, as well as limited access to the area could continue under Alternative 1 (No Action). These impacts are primarily a result of park administrative operations and existing habitat disruption in the form of heavily traveled roads and other developed areas. While no additional adverse impacts would occur under Alternative 1, there would also be no opportunity for improved access to or protection of ethnographic resources resulting from facilities removal or reduction in user capacity.

## **Segment 7: Wawona Campground and Store**

### ***Impacts of Actions to Protect and Enhance River Values***

Segment 7 contains a large archeological site, especially in the area of the northernmost campground “loop.” Similarly, there is a known archeological site in the area of the Wawona Store. Under Alternative 1 (No Action), no opportunities for limiting access to these areas would occur.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Issues associated with Alternative 1 (No Action) are ongoing concerns by traditionally associated American Indians regarding maintenance protection of archeological sites from visitor use impacts. Alternative 1 would provide no opportunities to alter these impacts that result from current, sometimes crowded, conditions.

## **Summary of Alternative 1 (No Action) Impacts**

Under Alternative 1 (No Action), impacts on traditional cultural resources would be negligible under NEPA criteria. There would be no planned changes in the treatment of traditional cultural resources in the Merced River corridor. Impacts on these resources would occur as a result of ongoing park operations and programs, such as facilities maintenance and repair, as well as visitor use. The projected 3% increase in annual visitation under Alternative 1 would potentially affect access to ceremonial locations by traditionally associated American Indians, especially during the peak season when many important traditional practices take place. Impacts on traditional cultural resources would occur throughout Segments 2 and 4 and be long term, minor to major, and adverse.

**Table 9-252** summarizes the kinds of traditional cultural resources that may be found within the Park, and NEPA-level analysis of the overall impact of no action. It highlights the context of proposed Alternative 1 (no-action), duration and type of impacts, and overall impact on resources. Ongoing consultation with traditionally associated American Indian tribes and groups would continue under Alternative 1 (No Action) to identify and understand potential adverse impacts and determine appropriate mitigation measures. As an example, monitoring by American Indian representatives of potential ground disturbing activities for ongoing park operations would likely be appropriate. Consultation with traditionally associated American Indian tribes and groups is also required under section 106 of NHPA.

### **Cumulative Impacts of Alternative 1 (No Action)**

Cumulative impacts on traditional cultural resources are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential impacts of Alternative 1 (No Action). The projects identified below include only those projects that could affect traditional cultural resources within the Merced River corridor.

#### ***Past Actions***

Past development, visitor use, natural events, and widespread disruption of cultural traditions has damaged ethnographic resources and their traditional cultural associations throughout the Yosemite area. Development of facilities within the Merced River corridor has disturbed or destroyed numerous ethnographic resources and compromised the integrity of habitat for traditionally important plant species. Appendix C contains the list of past actions that have resulted in cumulative impacts on environmental resources. With regard to traditional cultural resources such as areas of traditional plant use, actions at Cook's Meadow, Fern Springs, Merced River at Eagle Creek, and other restoration activities, as well as the *2004 Fire Management Plan* may improve conditions for native species. Those that include habitat restoration were developed and implemented in consultation with representatives of traditionally associated American Indian tribes and groups. Habitat restoration projects generally provide a beneficial impact for traditional use plant population areas. NPS continues to monitor the impacts of these actions.

#### ***Present and Future Actions***

Projects have the potential to result in adverse impacts, including damage to traditional use plant population areas and historic village or restricted access to traditional use places. Projects that could result in either beneficial or adverse impacts through management of ethnographic resources include the *Scenic Vista Management Plan*, *Vegetation Management Plan* and the upcoming *Yosemite Wilderness Stewardship Plan/EIS*. General restoration projects also provide the potential for restoration of native plant habitat, including plants used traditionally by American Indians. Beneficial impacts would result from the development of the Wahnog Indian Cultural Center by providing a location for traditional cultural activities and ceremonies, managed by culturally associated tribes and groups. The intensity of impacts from future operational actions depends on the nature, location, and design of the undertaking, as well as the quantity and nature of ethnographic resource(s) affected. Every effort would be made during the design phase to avoid adverse impacts. Where such avoidance is not feasible

**TABLE 9-252: EXAMPLES OF TRADITIONAL CULTURAL RESOURCES AND OVERALL IMPACTS OF ALTERNATIVE 1 (NO ACTION)**

Type of Resource	Context	Intensity	Duration of Impact	Type of Impact	Overall Impact
<b>Merced River</b>	Regional	Minor to major	Short to long-term	Indirect and direct adverse impacts	Unchanged from current conditions. Potential adverse impacts due to heavier visitor use and ongoing park operations and programs
<b>Yosemite Valley</b>	Regional	Minor to major	Short- to long- term	Indirect and direct adverse impacts	Unchanged from current conditions. Potentially adverse impacts due to heavier visitor use and ongoing park operations and programs.
<b>Ethnohistoric village areas</b>	Parkwide to segmentwide	Minor to major	Short- to long- term	Indirect and direct adverse impacts	Unchanged from current conditions. Potentially adverse impacts due to heavier visitor use and ongoing park operations and programs.
<b>Traditional use plant population areas</b>	Parkwide to segmentwide	Minor to major	Short- to long- term	Indirect and direct adverse impacts	Unchanged from current conditions. Potentially adverse impacts due to heavier visitor use and ongoing park operations and programs.
<b>Sites of spiritual significance</b>	Parkwide to segmentwide	Minor to Major	Short- to long- term	Indirect and direct adverse impacts	Unchanged from current conditions. Potentially adverse impacts due to heavier visitor use and ongoing park operations and programs.
<b>Archeological sites valued as traditional cultural resources</b>	Parkwide to segmentwide	Minor to Major	Short- to long- term	Indirect and direct adverse impacts	Unchanged from current conditions. Potentially adverse impacts due to heavier visitor use and ongoing park operations and programs.
<b>Ceremonial or traditional use sites</b>	Parkwide to segmentwide	Minor to Major	Short- to long- term	Indirect and direct adverse impacts	Unchanged from current conditions. Potentially adverse impacts due to heavier visitor use and ongoing park operations and programs.
<b>Places important to traditional history</b>	Parkwide to segmentwide	Minor to Major	Short- to long- term	Indirect and direct adverse impacts	Unchanged from current conditions. Potentially adverse impacts due to heavier visitor use and ongoing park operations and programs.
<b>Sites with other important qualities</b>	Parkwide	Negligible	Long-term	No impact	Unchanged from current conditions
	Parkwide to segmentwide	Minor to Major	Short- to long- term	Indirect and direct adverse impacts	Potentially adverse due to heavier visitor use and ongoing park operations and programs

or prudent, the park, in consultation with traditionally associated American Indian tribes and groups, would mitigate the impacts to the greatest extent possible, potentially reducing the intensity of the impacts.

#### ***Overall Cumulative Impacts of Alternative 1 (No Action)***

Alternative 1 (No Action) in consideration with past, present, and future actions would result in no change in the treatment and management of traditional cultural resources. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the servicewide 2008 programmatic agreement. Cumulative impacts of Alternative 1 on traditional cultural resources would be negligible under the NEPA significance criteria.

#### ***Environmental Consequences of Actions Common to Alternatives 2–6***

Many of the actions under Alternatives 2–6 to protect and enhance river values in Segment 2 would result in long-term, beneficial impacts on populations of ethnobotanically important plants, ecological stability of traditionally important locales, reduction or elimination of ongoing visitor use impacts on archeological sites and other traditional cultural resources, and improved clarity and understanding of traditionally important views. Table 9-253 groups and summarizes actions with similar impacts, although some individual actions are addressed in a more specific manner. Table 9-253 considers actions to protect and enhance river values, as well as those intended to manage visitor use and facilities.

Adverse impacts are possible during any action involving ground disturbance to a traditional cultural resource, or resulting from restricting access for traditionally associated American Indian tribes and groups to important areas.

Considering the actions common to Alternatives 2–6, impacts on these resources may be negligible under NEPA criteria, although this conclusion is dependent upon information learned during consultation with traditionally associated American Indian tribes and groups. As discussed in the “Archeological Resources” section analysis of actions common to Alternatives 2–6, there would be minor to major adverse impacts on known and unknown archeological resources under NEPA criteria, and an adverse effect under NHPA. While recognizing that archeological resources have the potential to be traditional cultural resources, discussions of archeological sites for their scientific value is addressed elsewhere. For this section, it is important to recognize that consultation with traditionally associated American Indian tribes and groups is also a NHPA requirement.

The proposed removal and reduction of various unused, outdated, inappropriate, or inadequate recreational, retail, employee housing, operational, and other facilities would remove visual clutter and non-traditional activities from the river corridor, thereby restoring some of the river’s traditional setting, a beneficial impact. As with all ground-disturbing activities, consultation with traditionally associated American Indians is recommended to ensure the no physical damage occurs to archeological or other ethnographic resources during demolition and restoration activities. Monitoring by traditionally associated American Indians may be required during these activities. Considering the actions common to Alternatives 2–6, assuming traditional cultural resources could be avoided, adverse impacts on these

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>All Segments - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
All segments	Parkwide: removal of informal trails that encroach onto sites designated as American Indian traditional cultural resources would result in a reduction of ongoing, minor to moderate impacts from trespassing, including erosion and destruction of natural vegetation in sites significant for traditional plant use areas, spiritual uses, ethnographic villages, and other sites.	To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity to meadow management efforts.  Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impact.  Overall impact on traditional cultural resources under Alternatives 2–6 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during restoration activities. <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.
All segments	Parkwide: decompacting soils and planting native vegetation on denuded areas could be a beneficial impact in those areas recorded as traditional use plant population areas, and proposed fencing and signage would direct visitor use to appropriate areas.	As above	As above
All segments	Parkwide: restoration of hydrologic processes and renewed use of low-intensity fire to restore meadows and black oak communities.	As above	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impact.  Overall could result in beneficial impacts on traditional ethnobotanical resources, unimpeded views of culturally important geologic features, and restoration of meadow-based sacred sites.  Use of fire, in particular, would help restore the conditions of the meadows to that maintained for centuries by the area's traditionally associated American Indians and would provide public recognition of the efficacy of traditional land management skills. <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>All Segments - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Hydrological Resource Actions</b>			
All segments	Parkwide: removal of riprap, use of bioengineering stabilization techniques, and subsequent revegetation of the riverbanks with riparian species could potentially result in a beneficial impact for traditional cultural resources associated with traditional plant use along the riverbanks, as well as restoring the river itself to a more natural condition consistent with traditional cultural resources. Incorporation of large woody debris and constructed logjams would also improve the natural condition of the river.	To avoid adverse impacts, or reduce impacts, hydrological resource actions should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity to meadow management efforts.  Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impact.  Overall impact on traditional cultural resources under Alternatives 2–6 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during hydrological resource actions.  <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.
All segments	Parkwide: directed visitor access, revegetation, protection, and stabilization of eroded riverbanks would potentially benefit American Indian traditional cultural resources directly associated with the river.	As above	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impact.  Protecting the riparian zone from new development, and removing or relocating campsites at least 100 feet away from the ordinary high-water mark could potentially result in a beneficial impact on traditional cultural resources associated with traditional plant use areas.  Use of fire, in particular, would help restore the conditions of the meadows to that maintained for centuries by the area's traditionally associated American Indians and would provide public recognition of the efficacy of traditional land management skills.  <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 1 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
1: Merced River above Nevada Fall	Segmentwide: rerouting of trails out of sensitive habitats, construction of fencing and/or boardwalks to elevate trails over wetlands, and removal of informal trails in meadow habitats.	To avoid adverse impacts, or reduce impacts, biological resource actions should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, to restore traditional cultural continuity to meadow management efforts, and to avoid archeological resources.  Monitoring by traditionally associated American Indians of activities may be warranted in some areas.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impact.  Overall impact on traditional cultural resources under Alternatives 2–6 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during biological resource actions. Removal of informal trails may have a beneficial impact on traditional plant use areas.  <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.  Consultation may result in mitigations that reduce adverse impacts.
<b>Segment 2 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
2: Yosemite Valley	Segmentwide: improvements to meadow hydrology and habitat through filling ditches and reinstating a low-intensity fire regime.	Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.  Monitoring by American Indian representatives of such ground disturbance would be appropriate.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.  Overall impact on traditional cultural resources under Alternatives 2–6 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during biological resource actions. Actions may have long-term, beneficial impacts on meadows.  <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.  Consultation may result in mitigations that reduce adverse impacts.



**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley	Segmentwide: removal of abandoned underground infrastructure and related facilities (parking and other ground disturbances) from various locations.	<p>Representatives of traditionally associated American Indian tribes and groups should be consulted regarding any specific project methods and locations that could result in additional impacts on ethnographic resources. These actions are likely to be highly controversial for traditionally associated American Indians, and many may feel that the adverse impacts would outweigh any beneficial impacts of this action.</p> <p>Representatives would likely want to monitor the removal activities and/or perform traditional ceremonies to restore ethnographic and/or spiritual integrity.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> Ultimately, by removing the infrastructure and revegetating the area with native plants, minor to moderate beneficial impacts could result.</p> <p><i>Intensity and type of impact:</i> If avoidance of removal activities is not feasible, adverse impacts would be moderate to major.</p> <p>Although areas of underground utilities were previously disturbed during original construction of the infrastructure, removal could result in adverse impacts on highly sensitive ethnographic/archeological resources.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Segmentwide: construction of elevated bicycle paths and boardwalks.	<p>If ground-disturbing activities associated with construction of the boardwalks could affect traditional plant use, spiritual, village, or other sites, then representatives from traditionally associated American Indian tribes and groups would be consulted and invited to collaborate on solutions.</p> <p>Monitoring by American Indian representatives of ground disturbing activities may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> Bicycle and pedestrian paths across meadows under Alternatives 2–6 might encroach on American Indian ethnographic sites (as well as archeological sites, as discussed elsewhere). Avoidance would be given preferential consideration, and result in a minor to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction could result in short-term and long-term impacts from disruptions to the setting of these sites both during construction activities and with use of such paths by park visitors.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Segmentwide: removal of infrastructure in Royal Arches meadow – a known important traditional use plant population area	<p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> Ultimately, by removing the infrastructure and revegetating the area with native plants, minor to moderate beneficial impacts could result.</p>

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley (cont.)			<p><i>Intensity and type of impact:</i> If avoidance of removal activities is not feasible, adverse impacts would be moderate to major.</p> <p>Although areas of underground utilities were previously disturbed during original construction of the infrastructure, removal could result in adverse impacts on highly sensitive ethnographic/archeological resources.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Segmentwide: restoration of floodplain areas that were formal campgrounds prior to the 1997 flood -- in the immediate vicinity of known traditional use plant population.	<p>Consultation with traditionally associated American Indians is recommended. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>Restoration activities (decompaction of soils, removal of fill material, and removal of invasive species) could lead to enhancement of the habitat and, ultimately, a beneficial impact on ethnobotanically important species.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2 – Yosemite Valley	Localized: unimproved parking area at Camp 6 has no mitigations for water quality and flood control. This action will move the unimproved parking area north closer to the Village Center and reroute Northside Drive to just above the 10-year floodplain. Meadow and floodplain ecosystems will be restored.	<p>As this is in an area of known archeological resources, Consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p>As above</p> <p>Restoration of meadow may result in new areas for traditional use plant population areas for seasonal uses. Consultation may promote cultural continuity of land management strategies.</p>

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Hydrologic Resource Actions</b>			
2: Yosemite Valley	Segmentwide: redirecting visitors away from sensitive riverbanks and overused areas near Valley bridges, beaches, and picnic areas, including revegetating and fencing eroded areas, removing riprap, and rebuilding the riverbank -- potentially occurring within traditional use plant population areas.	Consultation with traditionally associated American Indians is recommended. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies. Monitoring by American Indian representatives of such actions may be appropriate.	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>Redirecting visitor use to resilient sandbars may potentially allow for a long-term beneficial restoration of native plant habitat, providing that access to these areas is maintained for traditionally associated American Indians.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Segmentwide: redirection in portions of the East Valley campgrounds – intent to redirect campground visitors away from unstable slopes and toward resilient sandy beaches.	As above	As above
2: Yosemite Valley	Segmentwide: delineate and connect segments of the Valley Loop Trail. This will move the Valley Loop Trail out of the Wauhoga Designated Use Area.	<p>Actions should take into account the locations of ethnographic resources, and ensure that trail reconstruction would not affect archeological sites or other traditionally important areas.</p> <p>Monitoring of such actions by American Indian representatives may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>If portions of trail are rerouted away from resources, as determined appropriate by the park's American Indian consulting partners, this would result in a long-term beneficial impact. Should avoidance of resources not be practical, Consultation may result in mitigations that reduce impacts.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Hydrologic Resource Actions (cont.)</b>			
2: Yosemite Valley	Localized: restoration of riparian habitat at the site of the former Yosemite Lodge cabins and wellness center -- within the immediate vicinity of a known ethnographic site.	Consultation with traditionally associated American Indians is recommended. This would help to avoid any adverse impacts related to physical disturbance of known ethnographic resources.  Monitoring of such actions by American Indian representatives would likely be appropriate.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.  Overall impacts on traditional cultural resources would be beneficial, provided that physical impacts on ethnographic and other sites valued as traditional cultural resources could be avoided during restoration activities.  <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.  Consultation may result in mitigations that reduce adverse impacts.
<b>Segment 2 - Actions: Manage Visitor Use and Facilities</b>			
2: Yosemite Valley	Segmentwide: removal of several buildings and facilities, construction of new facilities and parking areas  Specific areas: expansion of Camp 4 (Sunnyside Campground) and Backpackers – would potentially encroach on nearby ethnographic resources  Improvements to visitor facilities at Bridalveil Fall  Construction of new parking lots and expansion of existing lots  Removal of Valley Garage Service and relocation to Government Utility Building  Expansion of Camp 6 parking into previous footprint of Valley Garage area	Yosemite Valley is an area known to have archeological sites and ethnographic uses such as village sites.  Consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.  Construction or removal activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.  Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas, especially in areas of ground disturbing activities.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.  Overall impact on traditional cultural resources under Alternatives 2–6 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during planned actions. Removal of some buildings may also redirect visitor activity away from known sites, or provide new opportunities for traditional plant use areas.  <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.  Consultation may result in mitigations that reduce adverse impacts.

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
2: Yosemite Valley (cont.)	<p>Construction of two-bay roads and trails maintenance building in proximity to the Government Utility Building</p> <p>Retain existing facilities and services of Ahwahnee Hotel, but remove pool and tennis courts associated with Hotel</p> <p>Remove old and temporary housing at Highland Court and the Thousand Cabins in the Yosemite Lodge area and replace with new housing</p> <p>Retain Yosemite Lodge maintenance and housekeeping</p> <p>Remove NPS Volunteer Office (former Wellness Center), post office, swimming pool, and snack stand in Yosemite Lodge area</p> <p>Remove Concessioner General Office in Yosemite Village (use infilled into other existing buildings)</p>	For those uses that would be relocated, the new locations of these facilities would need to be assessed for potential sites as the destination of each facility is being planned, to avoid inadvertent impact to traditional cultural resources in other areas. As above, consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.	
<b>Segments 3 and 4 - Actions: Protect and Enhance River Values</b>			
<b>Scenic Resource Actions</b>			
3: Merced River Gorge	Segmentwide: removal of encroaching conifers	<p>To avoid adverse impacts, or reduce impacts, any removal activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity of land management efforts.</p> <p>Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> may have a minor, beneficial impact on traditional cultural resources in Segment 3 through preservation and propagation of other important ethnobotanical resource.</p> <p><i>Intensity and type of impact:</i> If avoidance of known traditional cultural resources is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segments 3 and 4 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions</b>			
3 and 4: Merced River Gorge and El Portal	Segmentwide: removing informal trails, nonessential roads, surface paving, and imported rock	<p>Consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.</p> <p>Construction or removal activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians may be warranted in some areas, especially in areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to moderate beneficial impacts.</p> <p>If portions of trails are rerouted away from resources, as determined appropriate by the park's American Indian consulting partners, this would result in a long-term beneficial impact.</p> <p><i>Intensity and type of impact:</i> If avoidance of resources is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
4: El Portal	<p>Segmentwide: removal of abandoned infrastructure (includes area of abandoned El Portal Wastewater Treatment Plant).</p> <p>Restoration actions in the Abbieville/Trailer Village area</p>	<p>As above</p> <p>This area is in known proximity of archeological and ethnographic resources</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to moderate beneficial impacts.</p> <p>Overall impact on traditional cultural resources under Alternatives 2–6 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during planned actions. Removal of some buildings may also redirect visitor activity away from known sites, or provide new opportunities for traditional plant use areas.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, as well as archeological sites, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>

**TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segments 3 and 4 - Actions: Manage Visitor Use and Facilities</b>			
4: El Portal	Segmentwide: infill of employee housing units	As above, with regard to planning of housing units	As above
<b>Segments 5, 6, 7, and 8 - Actions: Protect and Enhance River Values</b>			
<b>Cultural Resource Actions</b>			
5: South Fork Merced River	Segmentwide: remove informal trails and charcoal rings from sensitive archeological resources	To avoid adverse impacts, or reduce impacts, removal activities should be planned in consultation with traditionally associated American Indians to avoid impacts to traditional cultural resources, and to ensure uninterrupted access to ethnographic resources during and after these activities  Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.	<i>Duration of Impact:</i> long-term  <i>Intensity and type of impact:</i> redirection of visitors away from sensitive archeological resources results in minor to moderate beneficial impacts. Overall impact on traditional cultural resources under Alternatives 2–6 is beneficial, provided that physical impacts on archeological resources is avoided during planned actions.
7: South Fork Merced River	Localized: some Wawona Campground sites removed that are either within the 100 foot floodplain, within 100-150 feet of the river or in culturally sensitive areas.	The campsites are currently located within a sensitive cultural area.  To avoid adverse impacts, or reduce impacts, removal of the campsites should be planned in consultation with traditionally associated American Indians.  Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.	<i>Duration of Impact:</i> long-term  <i>Type of impact:</i> Removal of the campsites would provide a minor to moderate benefit impact to this resource by eliminating a source of erosion and trampling. Restoration of the area would improve the integrity of the site setting.
<b>Segments 5, 6, 7, and 8 - Actions: Manage Visitor Use and Facilities</b>			
7: South Fork Merced River	Segmentwide: new formal river access and visitor amenities, such as restrooms and waste disposal, near the Wawona Swinging Bridge	As above, with regard to new construction	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.  Overall impact on traditional cultural resources under Alternatives 2–6 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during planned actions.

TABLE 9-253: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVES 2–6 (CONTINUED)

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
Segments 5, 6, 7, and 8 - Actions: Manage Visitor Use and Facilities (cont.)			
7: South Fork Merced River (cont.)			<i>Intensity and type of impact:</i> If avoidance of traditional cultural resources is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.



resources would be negligible under NEPA criteria. This conclusion is dependent upon information learned during consultation with traditionally associated American Indian tribes and groups. If avoidance of traditional cultural resources is not feasible, adverse impacts would be minor, moderate, to major, depending on the resource. Consultation with traditionally associated American Indians during and after the planning stages of proposed actions may result in mitigations that reduce adverse impacts.

### **Cultural Resource Actions**

All proposed actions to protect archeological sites from ongoing impacts of inappropriate uses (stock trails, informal trails, parking, climbing, unauthorized camping, and graffiti) would ultimately result in minor to moderate beneficial impacts to sites valued as traditional cultural resources. Consultation with traditionally associated American Indians would be vital to ensure continuous access to these sites for cultural uses. Consultation is also recommended to solicit American Indians' input on designs of the specific plans for site restoration, as well as development of interpretive, educational, and outreach materials. In most instances, monitoring by American Indian representatives of restoration activities would likely be appropriate.

### **Biological Resource Actions**

Specific projects to protect and enhance the river's biological values that would occur across all segments under Alternatives 2-6 include management of invasive plant species and other actions to stabilize and enhance populations of traditionally used native plants could have a beneficial long-term impact on ethnobotanical resources. Specific management methods, techniques, and timing should be discussed with the park's American Indian consulting partners to prevent unintended consequences to ecosystems, or inadvertently restricting access to ethnographic resources.

Under Alternatives 2–6, various actions would occur in each river segment to restore the Merced River and its interrelated habitats to more natural conditions. Abandoned underground infrastructure, such as sewer and water pipes and wastewater treatment facilities, would be removed from all river segments. Because abandoned underground infrastructure removal projects would be subject to review under NEPA and section 106 of the NHPA on an individual basis, impacts on traditional cultural resources would be assessed and mitigated as necessary when project-level plans are complete. Avoidance of ethnographic resources would first be attempted. Consultation with traditionally associated American Indian tribes and groups will be an integral part of the planning process. No additional impacts on these resources would result from the programmatic management actions.

### **Hydrologic/Geologic Resource Actions**

The proposed measures under Alternatives 2–6 to improve the free-flowing condition of the Merced River in various locations by use of brush layering, large woody debris, and constructed logjams to lessen the scouring effects of bridges and encourage channel complexity would not occur within or adjacent to any known ethnographic sites. Similarly, removal of old bridge footings and gaging station equipment would not directly affect known locations of ethnobotanical or other traditional uses. As consultation has confirmed, the river itself is a traditional cultural resource, and restoration to a more

natural condition would enhance its association as a traditional cultural resource in Segment 2. Monitoring by American Indian representatives of specific actions may be appropriate.

### Scenic Resource Actions

Scenic restoration management actions, and proposed removal of facilities and infrastructure (housing, tennis courts, irrigation lines, and ditches) from Yosemite Valley meadows under Alternatives 2–6 would allow for the enhancement of ethnobotanical resources in these areas. Because of the ethnographic sensitivity of the meadows, consultation with representatives from traditionally associated American Indian tribes and groups is recommended to determine the best way to maximize benefits to these Segment 2 sites.

### Summary of Impacts Common to Alternatives 2–6

Some of the management actions proposed for Alternatives 2–6 would have the potential to result in minor to moderate adverse impacts on known traditional cultural resources through actions related to restoration, construction, and facilities removal. These could result in short-term or long-term changes in the setting of the resource, destruction of native vegetation, changes in important views, or disruption through visitor use or lack of access. Consultation with representatives from traditionally associated American Indian tribes and groups is recommended to find design solutions for specific actions that would avoid or minimize short- and long-term impacts on traditional use plant population areas, archeological sites, spiritual sites, ethnographic village locations, and other significant sites. In some cases, monitoring by American Indian representatives of actions may be appropriate. Consultation may result in mitigations that reduce adverse impacts.

Many of the restoration actions associated with Alternatives 2–6 would result in minor to moderate long-term, beneficial impacts on known traditional cultural resources, either through restrictions on types or amounts of visitor use that can cause damage or influence the setting of traditional sites, or restoration of traditional use plant population areas.

### *Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration*

#### All River Segments

To avoid or reduce adverse impacts, restoration, visitor management, and construction activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access, and avoid areas of known traditional cultural resources. Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas. If avoidance is not feasible, adverse impacts would result. Consultation may result in mitigations that reduce adverse impacts. Text below describes actions specific to Alternative 2, and assumes that consultation and avoidance of impacts to traditional cultural resources would occur whenever possible. **Table 9-254** provides NEPA analysis of potential impacts to traditional cultural resources and recommendations for consultation.

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>All Segments - Actions: Manage Visitor Use and Facilities</b>			
All segments	Parkwide: management of swimming and boating access in all river segments under Alternative 2 would influence the traditional cultural resources related to the Merced River's setting and condition	To avoid adverse impacts, or reduce impacts, restriction of boating activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity to meadow management efforts.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> management of access results in minor to moderate beneficial impacts.  Eliminating commercial boating and implementing strict number restrictions on private boats within some river segments would result in the greatest beneficial impact on traditional cultural resources.
All segments	Parkwide: implementation of a day use reservation system would influence one of the most important aspects of traditional cultural association: access to park lands and resources	To avoid adverse impacts, or reduce impacts, implementation of a day use reservation system should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity to meadow management efforts.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> implementation of day use program could result in minor to moderate beneficial impacts.  In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. If both of these criteria are met, then it could reasonably be stated that the day use reservation system proposed under Alternative 2 would not negatively affect American Indian traditional cultural properties. Otherwise, implementation of a day use reservation system has the potential to adversely impact traditional cultural resources and would possibly be in conflict with the American Indian Religious Freedom Act.
<b>Segment 1 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
1: Merced River above Nevada Fall	Segmentwide: changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp	Some actions are proposed in areas with known archeological sites.  To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> avoidance of resources results in negligible to moderate beneficial impact.  Overall impact on traditional cultural resources could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during restoration activities.

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 1 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
1: Merced River above Nevada Fall (cont.)		Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas of ground disturbing activities.	<p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>As an example, construction may result in disruption of ethnobotanical species' habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segment 2 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
2: Yosemite Valley	Segmentwide: rerouting trails, bicycle paths, and roads in all Yosemite Valley meadows	<p>These actions have the potential to affect traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley	Localized: removal of housing and other development from between the Village Store and Ahwahnee Meadow would provide benefits to the ecology of the meadow	Proximity of an ethnohistoric village site suggests that adverse impacts could occur.  Consultation is recommended to determine the best way to achieve the restoration goals without inflicting damage on the site during earthmoving activities.  Monitoring by American Indian representatives of such ground disturbance would be appropriate.	As above  Construction may result in short-term disruption of ethnobotanical species' habitats, and may be an adverse impact. Restoration of meadow areas may have a long-term beneficial impact on the same plant use area.
2: Yosemite Valley	Localized: construction of 420 parking spaces Curry Orchard parking lot	This is in the vicinity of a known ethnohistoric village site.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of ethnographic resources.  Monitoring of ground disturbing activities by American Indian representatives may be appropriate.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.  <i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas would affect access to native flora	This is in the vicinity of known archeological sites.  Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.  Monitoring by American Indian representatives of such actions may be appropriate.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing traditional plan use areas.  <i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major  Consultation may result in mitigations that reduce impacts.

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley	Localized : removal of facilities and infrastructure, restoration of floodplain and riparian habitat, and conversion of the area into day use river access and picnicking in Housekeeping Camp	A large portion of Housekeeping Camp is located within an ethnohistoric village site.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.	As above  Removal and restoration efforts potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting.  Ground-disturbing activities may adversely impact known resources.
2: Yosemite Valley	Localized: removal of buildings in the Yosemite Lodge floodplain for restoration	As above	As above  While removal of unused facilities and restoration of vegetation would ultimately provide a long-term benefit for the site by restoring some of its traditional setting, the proposed actions (specifically, recontouring the ground surface) has the potential to adversely impact the physical integrity of the site.  Consultation may result in mitigations that reduce impacts.
<b>Hydrologic/Geologic Resource Actions</b>			
2: Yosemite Valley	Localized: removal of Sugar Pine and Ahwahnee Bridges, and rerouting multiuse trail between them, including restoration of native vegetation.	There are known archeological and ethnographic resources in this vicinity.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.  Monitoring by American Indian representatives of such ground disturbance would be appropriate.	<i>Duration of Impact: short- to long-term</i>  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  Bridge removal would have a beneficial impact on this resource by enhancing native vegetation species  <i>Intensity and type of impact:</i> Rerouting the trail to the north of the river may result in the trail encroaching on an ethnohistoric village site. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce impacts.

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities</b>			
2: Yosemite Valley	Segmentwide: reduced numbers of day use and overnight visitors proposed under Alternative 2 in Segment 2 would potentially have a beneficial impact on some types of traditional cultural resources.  Implementation of restricted access has the potential for adversely impacting access to traditional cultural resources.	Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. Otherwise, implementation of these actions has the potential for adversely impact access to traditional cultural resources and could possibly be in conflict with the American Indian Religious Freedom Act.  Consultation may result in mitigations that reduce impacts.
2: Yosemite Valley	Localized: removal of campsites at the Yellow Pine administrative group campsites	These actions would potentially impact a traditional use plant population area. Loss of the Yellow Pine campground as designated as tribal priority camping during annually scheduled traditional cultural events would also impact access to traditional cultural resources.  Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  <i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major  Consultation may result in mitigations that reduce impacts.
<b>Camp 6</b>			
2: Yosemite Valley	Localized: Move Camp 6 parking northward outside 10-year floodplain  Reroute Northside Drive south of the parking area  Formalize Camp 6/Village Center Parking Area with 550 parking places	Camp 6 is in the vicinity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites.  The proposed relocation of a parking area and rerouting of a portion of Northside Drive would be designed and planned in consultation with traditionally associated American Indians to avoid or minimize adverse impacts.	As above

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Curry Village Area</b>			
2: Yosemite Valley	Localized: removal of the Curry Village stables and associated lodging, followed by ecological restoration of the stables area, may affect native flora.	Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> The Curry Village stables are located in the vicinity of several traditional use plant population areas. Restoration following removal of the stables and associated lodging, would likely increase opportunities for native habitat to flourish, resulting in a minor to moderate beneficial effect.
<b>Yosemite Lodge and Camp 4</b>			
2: Yosemite Valley	Localized: removal of buildings in the Yosemite Lodge floodplain	There is a known ethnohistoric village site in this vicinity.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.  Monitoring by American Indian representatives of such ground disturbance would likely be warranted	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  Removal of buildings would have a beneficial impact on this resource by enhancing native vegetation species.  <i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of the ethnographic site. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce impacts.
2: Yosemite Valley	Localized: construction of a shuttle stop at Camp 4 (Sunnyside Campground)	There are known ethnographic resources in this vicinity.  To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.  Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  <i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce impacts.



**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Village and Housekeeping Camp</b>			
2: Yosemite Valley	Local: removal of facilities and infrastructure, restoration of floodplain and riparian habitat, and conversion of the area into day use river access and picnicking in Housekeeping Camp	<p>A large portion of Housekeeping Camp is located within an ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	As above
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas	<p>There are known traditional plan use and archeological resources in this vicinity.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p>As above</p> <p>Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing the native flora.</p>
<b>Segments 3 and 4 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
4: El Portal	Localized: restriction of parking and new building construction within a protection zone around a stand of valley oaks.	To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.	<p><i>Duration of Impact:</i> long-term</p> <p><i>Intensity and type of impact:</i> minor to moderate beneficial impacts.</p> <p>Removing current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove.</p>

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segments 3 and 4 - Actions: Manage Visitor Use and Facilities</b>			
4: El Portal	Localized: construction of replacement employee housing and administrative group camping in the Abbeville/Trailer Village area	<p>This area is in known proximity of archeological and ethnographic resources.</p> <p>Consultation with traditionally associated American Indian tribes and groups would determine the best uses for the Abbeville/Trailer Village area, especially in recognition that associated American Indians have a priority agreement for the administrative group campsites.</p> <p>Consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.</p> <p>Construction or removal activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians may be warranted in some areas, especially in areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>Overall impact on traditional cultural resources under Alternative 2 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during planned actions. Removal of some buildings may also redirect visitor activity away from known sites, or provide new opportunities for traditional plant use areas.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segments 5, 6, 7, and 8 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
7: South Fork Merced River	Localized: decommission and restore the Wawona Golf Course	<p>This area is in known proximity of archeological resources.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to avoid impacts to traditional cultural resources.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p>As above</p> <p>The golf course was constructed over an archeological site, and recontouring the ground surface to remove the artificial topography of the golf course would potentially disturb buried portions of the site.</p> <p>The meadow adjacent to the golf course is an American Indian traditional use area. Restoration of the gold course could have a beneficial impact.</p>

**TABLE 9-254: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 2 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segments 5, 6, 7, and 8 - Actions: Manage Visitor Use and Facilities</b>			
7: South Fork Merced River	Segmentwide: removal and relocation of two stock campsites from Wawona Stock Camp to the Wawona Stables area would affect traditional cultural resources.	<p>The campsites are currently located within a sensitive cultural area.</p> <p>To avoid adverse impacts, or reduce impacts, removal of the campsites should be planned in consultation with traditionally associated American Indians.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> long-term</p> <p><i>Type of impact:</i> Removal of the campsites would provide a minor to moderate benefit impact to this resource by eliminating a source of erosion and trampling. Restoration of the area would improve the integrity of the site setting.</p>
7: South Fork Merced River	Localized: redesign bus stop at Wawona Store to accommodate visitor use.	<p>This is in the general area of known archeological sites.</p> <p>To avoid adverse impacts, or reduce impacts, designing of the bus stop should be planned in consultation with traditionally associated American Indians.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce impacts.</p>

***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, there would be no actions to protect and enhance river values in all river segments beyond than those common to Alternatives 2–6.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

The management of swimming and boating access in all river segments under Alternative 2 would influence the traditional cultural resources related to the Merced River's setting and condition. Fewer boaters, in particular, would provide more opportunities for other visitors to experience the river in a more traditional state. Eliminating commercial boating and implementing strict number restrictions on private boats within some river segments would result in the greatest beneficial impact on traditional cultural resources, providing that traditionally associated American Indian tribes and groups do not have restricted access to important resources. Under Alternative 2, the park would implement a day use reservation system. One of the most important aspects of traditional cultural association is access to park lands and resources. In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. If both of these criteria are met, then it could reasonably be stated that the day use reservation system proposed under Alternative 2 would not adversely impact American Indian traditional cultural resources. Otherwise, implementation of a day use reservation system has the potential to be an adverse impact, and would possibly be in conflict with the American Indian Religious Freedom Act.

**Segment 1: Merced River Above Nevada Fall*****Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, there would be no actions to protect and enhance river values in Segment 1 beyond those common to Alternatives 2–6.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur across all segments under Alternative 2 include proposed changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp that would have the potential to both beneficially and adversely impact known archeological sites in the vicinity of these areas.

**Segment 2: Yosemite Valley*****Impacts of Actions to Protect and Enhance River Values***

Actions in the Segment 2, Yosemite Valley, have the potential to adversely impact ethnohistoric village sites, traditional use plant population areas, and/or archeological sites. These actions would be

designed and planned in consultation with traditionally associated American Indians to avoid or minimize impacts. Consultation may result in mitigation that reduces adverse impacts, and may result in beneficial impacts by directing activity away from known sites, and/or improving native vegetation.

**Biological Resource Actions.** Specific projects to protect and enhance the river's biological values that would occur in Segment 2 under Alternative 2 include rerouting trails, bicycle paths, and roads in all Yosemite Valley meadows, which has the potential to adversely impact traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources in Segment 2, as noted in **table 9-254**. Traditionally associated American Indian tribes and groups should be consulted to plan appropriate areas for reroutes and nondamaging methods for removing abandoned segments of trails.

The Curry Orchard parking lot and a portion of Stoneman Meadow are within the immediate vicinity of an ethnohistoric village site. The proposed partial restoration of the Curry Orchard parking lot under Alternative 2 could have a minor to moderate beneficial impact on this resource by restoring some of the setting integrity.

The proposed removal of housing and other development from between the Village Store and Ahwahnee Meadow would provide minor to moderate beneficial impacts to the ecology of the meadow, although the proximity of an ethnohistoric village site suggests that adverse impacts could occur. Consultation is recommended to determine the best way to achieve the restoration goals without inflicting damage on the site during earthmoving activities. A large portion of Housekeeping Camp is located within an ethnohistoric village site in Segment 2. The proposed removal of facilities and infrastructure, restoration of floodplain and riparian habitat, and conversion of the area into day use river access and picnicking under Alternative 2 would potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting. Ground-disturbing activities associated with demolition and removal of facilities could inadvertently affect the values of the site. Active restoration may also restrict access to the site.

The proposed removal of buildings in the Yosemite Lodge floodplain has the potential to adversely impact a large ethnohistoric village site in Segment 2. While removal of unused facilities and restoration of vegetation would ultimately provide a long-term benefit for the site by restoring some of its traditional setting, the proposed actions (specifically, recontouring the ground surface) has the potential to adversely impact both the physical integrity of the site, if archeological remains are present, and the ethnographic value of the resource.

The floodplains of the East Valley campgrounds contain traditional use plant population areas. The proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing the native flora. Access to traditional use plant population areas should be kept open during restoration activities through consultation with traditionally associated American Indians, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies. Impacts on the ethnographic values of nearby archeological sites valued as traditional cultural resources would also be discussed during consultation. Monitoring of ground disturbing activities by American Indian representatives may be required.

**Hydrologic/Geologic Resource Actions.** The multiuse trail between Sugar Pine Bridge and the Ahwahnee Bridge crosses a traditional use plant population area. Removal of these bridges under Alternative 2 would have a beneficial impact on this resource by enhancing native vegetation species. Rerouting the trail to the north of the river may result in the trail encroaching on known traditional cultural resources, including an archeological site and ethnohistoric village site. Consideration of this site is recommended when planning the rerouted trail location, and traditionally associated American Indian representatives may wish to monitor trail construction in this area.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

The Yellow Pine administrative group campsites are within a traditional use plant population area. Removal of the campsites and restoration of the area to a natural condition would result in beneficial impacts on ethnobotanical resources by enhancing native habitat and reducing visitor use impacts. This action could also have adverse impacts on traditional cultural resources because Yellow Pine campground is designated as tribal priority camping during annually scheduled traditional cultural events. Under Alternative 2, administrative group camping would be moved to the Abbieville/Trailer Village area of El Portal, an area with ethnographically sensitive sites that is also proposed for development of employee housing, causing an adverse impact. Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources. Impacts to specific geographic areas are discussed below.

**Curry Village.** The Curry Village stables are located in the vicinity of several traditional use plant population areas. Under Alternative 2, removal of the stables and associated lodging, followed by ecological restoration of the stables area, would likely increase opportunities for native habitat to flourish.

**Camp 6.** Camp 6 is in the vicinity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites. The proposed relocation of a parking area and rerouting of a portion of Northside Drive would be designed and planned in consultation with traditionally associated American Indians to avoid or minimize adverse impacts.

**Yosemite Lodge and Camp 4.** The proposed construction of a shuttle stop at Camp 4 would have the potential to adversely impact a number of nearby archeological and other ethnographic resources. The reduced numbers of day use and overnight visitors proposed under Alternative 2 in Segment 2 would potentially have a beneficial impact on some types of traditional cultural resources. Intensive visitor use affects the setting and feeling of traditional or spiritual sites and can impede access to these locations by cultural practitioners. Although visitor use can and does affect plant use areas, impacts are much more dependent on localized use specific to areas that contain these resources. A reduction in the overall visitor numbers would not necessarily reduce impacts on traditional use plant population areas.

Implementation of restricted access also has the potential for adversely impacting access to traditional cultural resources. One of the most important aspects of traditional cultural association is access to park lands and resources. In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must

be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. Otherwise, implementation of these actions has the potential for adversely affecting traditional cultural resources and could possibly be in conflict with the American Indian Religious Freedom Act.

The proposed conversion of the Yosemite Lodge and surrounding area to day use, camping, and parking, and associated removal and repurposing of various facilities under Alternative 2 would potentially affect the ethnographic values of a large village site (with some related archeological remains).

**Yosemite Village and Housekeeping Camp.** Under Alternative 2, a large number of campsites would be removed from the floodplain at all the East Valley campgrounds and habitat restoration would be conducted to revegetate and stabilize these areas of Segment 2. Several traditional use plant population areas are located in and around the current campgrounds, and these areas would potentially be affected by the proposed actions. Overall, the proposed actions would likely lead to long-term improvements in the health of native plant populations and, therefore, a beneficial impact on traditional cultural resources. To avoid adverse impacts during restoration activities, unrestricted access to these areas should be maintained for traditionally associated American Indians, as well as consultation on traditional land management strategies.

A large portion of Housekeeping Camp is located within an ethnohistoric village site in Segment 2. The proposed removal of all lodging facilities and most amenities and infrastructure (with the exception of one restroom for day users) would potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting. Ground-disturbing activities associated with demolition and removal of facilities could inadvertently adversely impact the values of the site. Active restoration may also restrict access to the site.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, there would be no actions to protect and enhance river values in Segment 3 beyond those common to Alternatives 2–6.

**Biological Resource Actions.** The proposed actions under Alternative 2 to restrict parking and new building construction within a protection zone around a stand of valley oaks in Segment 4 would result in a beneficial impact for these trees. Removing current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove and allow it to grow and flourish.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 2, there would be no actions to manage visitor use and facilities in Segment 3 beyond those common to Alternatives 2–6.

Under Alternative 2, the Abbieville/Trailer Village area would be used for replacement employee housing (405 beds) and administrative group camping, both of which would be relocated to El Portal,

from Yosemite Valley. This area has archeological and other traditional cultural resources present, and new construction could result in adverse impacts on these resources. Consultation with traditionally associated American Indian tribes and groups would determine the best uses for the Abbieville/Trailer Village area, especially in recognition that associated American Indians have a priority agreement for the administrative group campsites. Regarding the archeological and other traditional cultural resources present, consultation may result in mitigations that reduce impacts.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 2, the Wawona Golf Course would be decommissioned and restored to a natural condition. The golf course was constructed over an archeological site, which may retain sensitive cultural materials and traditional cultural resources. Recontouring the ground surface to remove the artificial topography of the golf course would potentially disturb buried portions of the site, as described in the “Archeological Resources” section earlier in this chapter. The meadow adjacent to the golf course is an American Indian traditional use area. Restoration of the golf course could have a beneficial impact.

Two stock campsites are proposed for removal from their current location in the Wawona stock camp and would be relocated to an area near the Wawona stables. Because the campsites are currently located within a sensitive cultural area, the removal of the campsites would provide a benefit to this resource by eliminating a source of erosion and trampling, and restoration of the area would improve the integrity of the site setting, providing a beneficial impact.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Removal of campsites from the Wawona Campground would reduce ongoing impacts on prehistoric and historic archeological site components. Although this action is primarily intended to be of benefit to the historic remains of U.S. Army Camp A.E. Wood, reduction in the intensity of camping would also have beneficial impacts for the physical integrity and ethnographic values of American Indian archeological remains.

### **Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

A portion of the management actions proposed under Alternative 2 would have the potential to result in adverse impacts, on known American Indian traditional cultural resources through actions related to restoration, construction, and facilities removal. These could result in short-term or long-term changes in the setting of the site, destruction of native vegetation, changes in important views, or disruption through visitor use or lack of access. Consultation with representatives from traditionally associated American Indian tribes and groups is recommended to find design solutions for specific actions, and would potentially avoid short- and long-term impacts on traditional use plant population areas, spiritual sites, ethnographic village locations, and other significant resources. Consultation with traditionally associated American Indian tribes and groups is required under NEPA and NHPA.



Many of the management actions associated with Alternative 2 would result in long-term, beneficial impacts on known traditional cultural resources, either through restrictions on types or amounts of visitor use that can cause damage, influencing the setting of traditional sites, or restoration of traditional use plant population areas.

### **Cumulative Impacts of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration**

#### ***Past Actions***

While none of the past actions listed in Appendix C specifically address traditional cultural resources, those that include habitat restoration were developed and implemented in consultation with representatives of traditionally associated American Indian tribes and groups. Habitat restoration projects generally provide a beneficial impact for traditional use plant population areas.

#### ***Present Actions***

The Yosemite *General Management Plan* contains provisions regarding proper management of traditional cultural resources and the circumstances under which consultation with traditionally associated groups is recommended. To date, none of the present cumulative scenario projects have resulted in measurable impacts on traditional use plant population areas, spiritual, village, or other sites.

#### ***Reasonably Foreseeable Future Actions***

There are no reasonably foreseeable future actions that have the potential to measurably affect traditional cultural resources.

### ***Overall Cumulative Impact from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration***

The combined past, present, and reasonably foreseeable future actions of the cumulative scenario would have a negligible or beneficial impact on traditional cultural resources after implementation of all associated mitigation and consultation, providing that impacts to traditional cultural resources are avoided. The proposed management actions associated with Alternatives 2, including actions common to Alternatives 2-6, may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings. Consultation with traditionally associated American Indian tribes or groups could result in mitigations that reduce cumulative impacts that may occur.

### ***Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

#### **All River Segments**

To avoid adverse impacts, restoration, visitor management, and construction activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access, and avoid areas of known traditional cultural resources. Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas. If avoidance is not feasible, adverse impacts would result. Consultation may result in mitigations that reduce impacts. Text below describes actions specific to Alternative 3, and assumes that consultation and avoidance of impacts to traditional cultural resources would occur whenever possible. **Table 9-255** provides NEPA analysis of potential impacts to traditional cultural resources and recommendations for consultation.

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 3, there would be no actions to protect and enhance river values in all river segments beyond those common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

The restrictions on boating in various sections of the Merced River would be in place. Commercial boating would be prohibited, but increased numbers of private boats would be allowed in Segment 2. Fewer boaters, in particular, would provide more opportunities for other visitors to experience the river in a more traditional state. Eliminating commercial boating and implementing strict number restrictions on private boats within some river segments would result in the greatest beneficial impact on traditional cultural resources, providing that traditionally associated American Indian tribes and groups do not have restricted access to important resources.

#### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 3, there would be no actions to protect and enhance river values in Segment 1 beyond those common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Biological Resource Actions.** Actions under Alternative 3 that would reduce or redesignate facilities and uses associated with Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp would have the potential to both beneficially and adversely impact known archeological sites in the vicinity of these areas.

**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>All Segments - Actions: Manage Visitor Use and Facilities</b>			
All segments	Parkwide: management of swimming and boating access in all river segments would influence the traditional cultural resources related to the Merced River's setting and condition	To avoid adverse impacts, or reduce impacts, restriction of boating activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity to meadow management efforts.	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact: management of access results in minor to moderate beneficial impacts.</i></p> <p><i>Eliminating commercial boating and implementing strict number restrictions on private boats within some river segments would result in the greatest beneficial impact on traditional cultural resources.</i></p>
<b>Segment 1 - Actions: Manage Visitor Use and Facilities</b>			
<b>Biological Resource Actions</b>			
1: Merced River above Nevada Fall	Segmentwide: changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp	<p>Some actions are proposed in areas with known archeological sites.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities.</p> <p>Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas of ground disturbing activities.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact: avoidance of resources results in negligible to moderate beneficial impact.</i></p> <p>Overall impact on traditional cultural resources could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during restoration activities.</p> <p><i>Intensity and type of impact: If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</i></p> <p>As an example, construction may result in disruption of ethnobotanical species' habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segment 2 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
2: Yosemite Valley	Segmentwide: rerouting trails, bicycle paths, and roads in all Yosemite Valley meadows	These actions have the potential to affect traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact: avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</i></p>

**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley (cont.)		<p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	<p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Localized: partial restoration of the Curry Orchard Day Use Parking Area to facilitate Stoneman Meadow restoration; removes 50 spaces for re-alignment to allow for a total of 300 parking spaces.	<p>This is in the vicinity of a known ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of ethnographic resources.</p> <p>Monitoring of ground disturbing activities by American Indian representatives may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p> <p>May provide a beneficial impact on traditional use plant population areas in these Segment 2 meadows. Nearby ethnographic village and/or archeological sites would be protected from adverse impacts during ground-disturbing restoration activities</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas would affect access to native flora	<p>This is in the vicinity of known archeological sites.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing traditional plan use areas.</p>

**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley (cont.)			<i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major Consultation may result in mitigations that reduce adverse impacts.
2: Yosemite Valley	Local: removal of facilities and infrastructure, restoration of floodplain and riparian habitat in Housekeeping Camp	A large portion of Housekeeping Camp is located within an ethnohistoric village site.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.	As above  Removal and restoration efforts potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting.  Ground-disturbing activities may adversely impact known resources.
2: Yosemite Valley	Local: removal of buildings in the Yosemite Lodge floodplain	As above  Proximity of an ethnohistoric village site suggests that adverse impacts could occur.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of ethnographic resources.  Monitoring of ground disturbing activities by American Indian representatives may be appropriate.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  Removal of unused facilities and restoration of vegetation would ultimately provide a long-term benefit for the site by restoring some of its traditional setting,  <i>Intensity and type of impact:</i> proposed actions (specifically, recontouring the ground surface) has the potential to affect both the physical integrity of the site. If avoidance is not feasible, impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.

**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Hydrologic/Geologic Resource Actions</b>			
2: Yosemite Valley	Localized: removal of Sugar Pine and Ahwahnee Bridges, and rerouting multiuse trail between them, including restoration of native vegetation.	<p>There are known archeological and ethnographic resources in this vicinity.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Bridge removal would have a beneficial impact on this resource by enhancing native vegetation species</p> <p><i>Intensity and type of impact:</i> Rerouting the trail to the north of the river may result in the trail encroaching on an ethnohistoric village site. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
<b>Segment 2 - Actions: Manage Visitor Use and Facilities</b>			
2: Yosemite Valley	<p>Segmentwide: reduced numbers of day use and overnight visitors proposed under Alternative 3 in Segment 2 would potentially have a beneficial impact on some types of traditional cultural resources</p> <p>Implementation of restricted access has the potential for adversely impacting access to traditional cultural resources.</p>	Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources.	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact:</i> In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. Otherwise, implementation of these actions has the potential for adversely impact access to traditional cultural resources and could possibly be in conflict with the American Indian Religious Freedom Act.</p> <p>Consultation may result in mitigations that reduce impacts.</p>

**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Camp 6</b>			
2: Yosemite Valley	<p>Localized: Move Camp 6 parking northward outside 10-year floodplain</p> <p>Reroute Northside Drive south of the parking area</p> <p>Formalize Camp 6/Village Center Parking Area with 550 parking places</p>	<p>Camp 6 is in the vicinity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites.</p> <p>The proposed relocation of a parking area and rerouting of a portion of Northside Drive would be designed and planned in consultation with traditionally associated American Indians to avoid or minimize adverse impacts.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact: avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</i></p> <p><i>Intensity and type of impact: If avoidance is not feasible, impacts would be minor, moderate, to major</i></p> <p><i>Consultation may result in mitigations that reduce impacts.</i></p>
<b>Curry Village Area</b>			
2: Yosemite Valley	<p>Local: removal of the Curry Village stables and associated lodging, followed by ecological restoration of the stables area, may affect native flora.</p>	<p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact: The Curry Village stables are located in the vicinity of several traditional use plant population areas. Restoration following removal of the stables and associated lodging, would likely increase opportunities for native habitat to flourish, resulting in a minor to moderate beneficial effect.</i></p>
2: Yosemite Valley	<p>Localized: extension of Upper Pines Campground would be constructed with new spaces for 36 recreational vehicles (RVs)</p>	<p>This is an area near a known ethnographic village site.</p> <p>To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact: avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</i></p> <p><i>Intensity and type of impact: Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</i></p> <p><i>Consultation may result in mitigations that reduce adverse impacts.</i></p>

**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Lodge and Camp 4</b>			
2: Yosemite Valley	Localized: removal of buildings in the Yosemite Lodge floodplain	<p>There is a known ethnohistoric village site in this vicinity.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would likely be warranted</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Removal of buildings would have a beneficial impact on this resource by enhancing native vegetation species.</p> <p><i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of the ethnographic site. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
2: Yosemite Valley	Localized: construction of a shuttle stop at Camp 4 (Sunnyside Campground)	<p>There are known ethnographic resources in this vicinity.</p> <p>To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
<b>Yosemite Village and Housekeeping Camp</b>			
2: Yosemite Valley	Localized: removal of facilities and infrastructure, restoration of floodplain and riparian habitat in Housekeeping Camp	<p>A large portion of Housekeeping Camp is located within an ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive</p>	As above



**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Village and Housekeeping Camp (cont.)</b>			
2: Yosemite Valley (cont.)		areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.  Monitoring by American Indian representatives of such ground disturbance would be appropriate.	
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas	There are known traditional plan use and archeological resources in this vicinity.  Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.  Monitoring by American Indian representatives of such actions may be appropriate.	As above  Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing the native flora.
<b>Segments 3 and 4 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
4: El Portal	Localized: restriction of parking and new building construction within a protection zone around a stand of valley oaks.	To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.	<i>Duration of Impact:</i> long-term <i>Intensity and type of impact:</i> minor to moderate beneficial impacts.  Removing current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove.
<b>Segments 3 and 4 - Actions: Manage Visitor Use and Facilities</b>			
4: El Portal	Localized: restoration of riparian areas in Abbeville	There are traditional cultural resources in the vicinity.  To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.	<i>Duration of Impact:</i> long-term <i>Intensity and type of impact:</i> minor to moderate beneficial impacts. New traditional use plant areas may result.

**TABLE 9-255: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS IN ALTERNATIVE 3 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segments 5, 6, 7, and 8 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
7: South Fork Merced River	Localized: decommission and restore the Wawona Golf Course	<p>This area is in known proximity of archeological resources.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to avoid impacts to traditional cultural resources.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>The meadow adjacent to the golf course is an American Indian traditional use area. Restoration of the gold course could have a beneficial impact.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>The golf course was constructed over an archeological site, and recontouring the ground surface to remove the artificial topography of the golf course would potentially disturb buried portions of the site.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segments 5, 6, 7, and 8 - Actions: Manage Visitor Use and Facilities</b>			
7: South Fork Merced River	Localized: removal and relocation of two stock campsites from Wawona Stock Camp to the Wawona Stables area would affect traditional cultural resources.	<p>The campsites are currently located within a sensitive cultural area.</p> <p>To avoid adverse impacts, or reduce impacts, removal of the campsites should be planned in consultation with traditionally associated American Indians.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> long-term</p> <p><i>Type of impact:</i> Removal of the campsites would provide a minor to moderate benefit impact to this resource by eliminating a source of erosion and trampling. Restoration of the area would improve the integrity of the site setting.</p>

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Rerouting trails, bicycle paths, and roads in all Yosemite Valley meadows has the potential to affect traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources in Segment 2. The Curry Orchard parking lot and a portion of Stoneman Meadow are within the immediate vicinity of an ethnohistoric village site. The proposed partial restoration of the Curry Orchard parking lot and Stoneman Meadow could have a minor beneficial impact on this resource by restoring some of the integrity of setting. Similarly, the proposed removal of facilities and infrastructure, restoration of floodplain and riparian habitat, and conversion of the area into day use river access and picnicking at Housekeeping Camp would potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the ethnohistoric village site's integrity of setting. Ground-disturbing activities associated with demolition and removal of facilities could inadvertently adversely impact the values of the site. Active restoration may also restrict access to the site.

The floodplains of the East Valley campgrounds contain traditional use plant population areas. The proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing the native flora. Access to traditional use plant population areas should be kept open during restoration activities through consultation with traditionally associated American Indians, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies. Impacts on the ethnographic values of nearby archeological sites valued as traditional cultural resources would also be discussed during consultation. Monitoring of ground disturbing activities by American Indian representatives may be required.

The proposed removal of buildings in the Yosemite Lodge floodplain has the potential to affect a large ethnohistoric village site in Segment 2. While removal of unused facilities and restoration of vegetation would ultimately provide a long-term beneficial impact for the site by restoring some of its traditional setting, the proposed actions (specifically, recontouring the ground surface) have the potential to adversely impact both the physical integrity of the site, if archeological remains are present, and the ethnographic value of the resource.

**Hydrologic/Geologic Resource Actions.** The multiuse trail between Sugar Pine Bridge and the Ahwahnee Bridge crosses a traditional use plant population area. Removal of these bridges would have a beneficial impact on this resource by enhancing native vegetation species. Rerouting the trail to the north of the river may result in the trail encroaching on an archeological site and ethnohistoric village site. Consideration of this site is recommended when planning the rerouted trail location, and traditionally associated American Indian representatives may wish to monitor trail construction in this area.

*Impacts of Actions to Manage User Capacities, Land Use, and Facilities*

**Curry Village.** The Curry Village stables are located in the vicinity of several traditional use plant population areas. Under Alternative 2, removal of the stables and associated lodging, followed by ecological restoration of the stables area, would likely increase opportunities for native habitat to flourish.

Proposed extension of Upper Pines Campground with new spaces for 36 recreational vehicles (RVs) in an area with known traditional cultural resources may result in adverse impacts. Consultation may result in mitigation that would reduce those adverse impacts.

**Camp 6.** Camp 6 is in the vicinity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites. The proposed relocation of a parking area and rerouting of a portion of Northside Drive would be designed and planned in consultation with traditionally associated American Indians to avoid or minimize adverse impacts.

**Yosemite Lodge and Camp 4.** The proposed construction of a shuttle stop at Camp 4 would have the potential to adversely affect a number of nearby archeological and other ethnographic resources.

Although Yosemite Lodge would not be converted to day use under Alternative 3, many of the facilities and infrastructure would be removed. Two new concessioner housing areas and employee parking spaces would be constructed in the Yosemite Lodge area under Alternative 3; this could introduce the potential for new adverse impacts from construction in a Segment 2 area known to contain archeological and other ethnographically sensitive resources.

**Yosemite Village and Housekeeping Camp.** A large portion of Housekeeping Camp is located within an ethnohistoric village site in Segment 2. The proposed removal of all lodging facilities and most amenities and infrastructure (with the exception of one restroom for day users) would potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting. Ground-disturbing activities associated with demolition and removal of facilities could inadvertently affect the values of the site. Active restoration may also restrict access to the site.

Under Alternative 3, a number of campsites would be removed from the East Valley campgrounds than under. Additionally, an extension of Upper Pines Campground would be constructed with new spaces for 36 recreational vehicles (RVs). Overall, the proposed actions would likely lead to long-term improvements in the health of native plant populations and, therefore, a beneficial impact on traditional cultural resources. However, some adverse affects are anticipated because the proposed new campground loop would be constructed near a known ethnographic village site.

**Segments 3 and 4: Merced River Gorge and El Portal***Impacts of Actions to Protect and Enhance River Values*

**Biological Resource Actions.** Under Alternative 3, the valley oak protection zone proposed would include an area on the east side of El Portal Road. The larger oak protection zone under Alternative 3

has the potential for minor to moderate beneficial impacts on the valley oaks. Consultation with traditionally associated American Indian tribes and groups would ensure uninterrupted access to ethnographic resources during these activities, and restore traditional cultural continuity of land management efforts.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 3, 35 existing housing units would remain at the Abbieville/Trailer Village area in Segment 4; additional employee housing and administrative group camping would not be relocated here from the Valley, new parking would not be constructed, and riparian areas next to the river would be restored. Riparian restoration would have a potential beneficial impact for nearby traditional cultural resources, when accomplished in consultation with traditionally associated American Indian tribes and groups.

**Segments 5, 6, 7, and 8: South Fork Merced River**

***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 3, the Wawona Golf Course would be decommissioned and restored, and two stock campsites would be moved from the Wawona stock camp to the Wawona stables. The golf course was constructed over an archeological site, which may retain sensitive cultural materials and traditional cultural resources. Recontouring the ground surface to remove the artificial topography of the golf course would potentially disturb buried portions of the site, as described in the “Archeological Resources” section earlier in this chapter. The meadow adjacent to the golf course is an American Indian traditional use area. Restoration of the gold course could have a beneficial impact.

Two stock campsites are proposed for removal from their current location in the Wawona stock camp and would be relocated to an area near the Wawona stables. Because the campsites are currently located within a sensitive cultural area, the removal of the campsites would provide a benefit to this resource by eliminating a source of erosion and trampling, and restoration of the area would improve the integrity of the site setting.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Campsites would be removed from the Wawona Campground under Alternative 3; this would have beneficial impacts for the physical integrity and ethnographic values of American Indian archeological remains.

**Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Some of the management actions proposed under Alternative 3 would have the potential to result in minor to moderate impacts to known traditional cultural resources through actions related to restoration, construction, and facilities removal. These could result in short-term or long-term changes in the setting of the site, destruction of native vegetation, changes in important views, or

disruption through visitor use or lack of access. Consultation with representatives from traditionally associated groups to find design solutions for specific actions would avoid or minimize short-term and long-term adverse impacts on traditional use plant population areas, spiritual sites, ethnographic village locations, archeological sites, and other significant sites.

Many of the management actions associated with Alternative 3 would result in long-term, beneficial impacts on known traditional cultural resources, either through restrictions on types or amounts of visitor use that can cause damage, restrict access, or influence the setting of traditional sites, or restoration of traditional use plant population areas. There would be slightly less habitat restoration, but also slightly less ground disturbance as a result of demolition, construction, and restoration activities.

### **Cumulative Impacts of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

Cumulatively considerable projects that could affect American Indian traditional cultural resources are the same as those identified for Alternative 2, and include past, present, and reasonably foreseeable actions in the study area.

#### ***Overall Cumulative Impact from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration***

The combined past, present, and reasonably foreseeable future actions of the cumulative scenario would have a negligible or beneficial impact on traditional cultural resources after implementation of all associated mitigation and consultation, providing that impacts to traditional cultural resources are avoided. The proposed management actions associated with Alternatives 3, including actions common to Alternatives 2-6, may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings. Consultation with traditionally associated American Indian tribes or groups could result in mitigations that reduce cumulative impacts that may occur.

### ***Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration***

To avoid or reduce adverse impacts, restoration, visitor management, and construction activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access, and avoid areas of known traditional cultural resources. Monitoring of ground disturbance by traditionally associated American Indians of activities would likely be warranted in some areas. If avoidance is not feasible, adverse impacts would result. Consultation may result in mitigations that reduce impacts. Text below describes actions specific to Alternative 4, and assumes that consultation and avoidance of impacts to traditional cultural resources would occur whenever possible. Table 9-256 provides NEPA analysis of potential impacts to traditional cultural resources and recommendations for consultation.

**TABLE 9-256: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 4**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>All Segments - Actions: Manage Visitor Use and Facilities</b>			
All segments	Parkwide: management of swimming and boating access in all river segments under Alternative 2 would influence the traditional cultural resources related to the Merced River's setting and condition	To avoid adverse impacts, or reduce impacts, restriction of boating activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity to meadow management efforts.	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> management of access results in minor to moderate beneficial impacts.</p> <p>Eliminating commercial boating and implementing strict number restrictions on private boats within some river segments would result in the greatest beneficial impact on traditional cultural resources.</p>
<b>Segment 1 - Actions: Manage Visitor Use and Facilities</b>			
<b>Biological Resource Actions</b>			
1: Merced River above Nevada Fall	Segmentwide: changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp	<p>Some actions are proposed in areas with known archeological sites.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities.</p> <p>Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to moderate beneficial impact.</p> <p>Overall impact on traditional cultural resources could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during restoration activities.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>As an example, construction may result in disruption of ethnobotanical species' habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segment 2 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
2: Yosemite Valley	Segmentwide: rerouting trails, bicycle paths, and roads in all Yosemite Valley meadows	These actions have the potential to affect traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p>

**TABLE 9-256: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 4 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley (cont.)		<p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	<p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Localized: partial restoration of the Curry Orchard Day Use Parking Area to facilitate Stoneman Meadow restoration	<p>This is in the vicinity of a known ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of ethnographic resources.</p> <p>Monitoring of ground disturbing activities by American Indian representatives may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p> <p>May provide a beneficial impact on traditional use plant population areas in these Segment 2 meadows. Nearby ethnographic village and/or archeological sites would be protected from adverse impacts during ground-disturbing restoration activities</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas would affect access to native flora	<p>This is in the vicinity of known archeological sites.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing traditional plan use areas.</p>



**TABLE 9-256: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 4 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley (cont.)			<i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major Consultation may result in mitigations that reduce impacts.
2: Yosemite Valley	Localized : removal of facilities and infrastructure, restoration of floodplain and riparian habitat, and conversion of the area into day use river access and picnicking in Housekeeping Camp	A large portion of Housekeeping Camp is located within an ethnohistoric village site.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.	As above  Removal and restoration efforts potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting.  Ground-disturbing activities may adversely impact known resources.
<b>Hydrologic/Geologic Resource Actions</b>			
2: Yosemite Valley	Localized: removal of Sugar Pine and Ahwahnee Bridges, and rerouting multiuse trail between them, including restoration of native vegetation.	There are known archeological and ethnographic resources in this vicinity.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.  Monitoring by American Indian representatives of such ground disturbance would be appropriate.	<i>Duration of Impact: short- to long-term</i>  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  Bridge removal would have a beneficial impact on this resource by enhancing native vegetation species  <i>Intensity and type of impact:</i> Rerouting the trail to the north of the river may result in the trail encroaching on an ethnohistoric village site. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce impacts.

**TABLE 9-256: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 4 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities</b>			
2: Yosemite Valley	Segmentwide: reduced numbers of day use and overnight visitors proposed under Alternative 2 in Segment 2 would potentially have a beneficial impact on some types of traditional cultural resources.  Implementation of restricted access has the potential for adversely impacting access to traditional cultural resources.	Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. Otherwise, implementation of these actions has the potential for adversely impact access to traditional cultural resources and could possibly be in conflict with the American Indian Religious Freedom Act.  Consultation may result in mitigations that reduce impacts.
<b>Camp 6</b>			
2: Yosemite Valley	Localized: Move Camp 6 north from the river to facilitate riparian restoration goals  Formalize Camp 6/Village Center Parking Area with 750 parking places  Construct a pedestrian underpass and roundabout at the Village Drive/Northside Drive intersection to address traffic congestion and pedestrian/vehicle conflicts.	Camp 6 is in the vicinity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.	<i>Duration of Impact:</i> short- to long-term <i>Intensity and type of impact:</i> avoidance of resources results in negligible impact <i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major  The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the physical integrity of resources in the area.  Consultation may result in mitigations that reduce impacts.
<b>Curry Village</b>			
2: Yosemite Valley	Localized: removal of the Curry Village stables and associated lodging, followed by ecological restoration of the stables area, may affect native flora.	To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.	<i>Duration of Impact:</i> short- to long-term <i>Type of impact:</i> beneficial  The Curry Village stables are located in the vicinity of several traditional use plant population areas. Restoration following removal of the stables and associated lodging, would likely increase opportunities for native habitat to flourish.

**TABLE 9-256: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 4 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Lodge and Camp 4</b>			
2: Yosemite Valley	Localized: construction of a shuttle stop at Camp 4 (Sunnyside Campground)	<p>There are known ethnographic resources in this vicinity.</p> <p>To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
2: Yosemite Valley	Localized: construction of new employee housing at Yosemite Lodge	<p>There is a known ethnohistoric village site in this vicinity.</p> <p>This action would be planned in consultation with traditionally associated American Indians. Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbing activities would likely be required.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible impact</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major</p> <p>The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the physical integrity of the site.</p> <p>Consultation may result in mitigations that reduce impacts.</p>

**TABLE 9-256: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 4 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Village and Housekeeping Camp</b>			
2: Yosemite Valley	Localized: removal of facilities and infrastructure, restoration of floodplain and riparian habitat, and conversion of the area into day use river access and picnicking in Housekeeping Camp	<p>A large portion of Housekeeping Camp is located within an ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	As above
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas	<p>There are known traditional plan use and archeological resources in this vicinity.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p>As above</p> <p>Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing the native flora.</p>
<b>Segments 3 and 4 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
4: El Portal	Localized: restriction of parking and new building construction within a protection zone around a stand of valley oaks.	To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.	<p><i>Duration of Impact:</i> long-term</p> <p><i>Intensity and type of impact:</i> minor to moderate beneficial impacts.</p> <p>Removing current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove.</p>

**TABLE 9-256: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 4 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segments 3 and 4 - Actions: Manage Visitor Use and Facilities</b>			
4: El Portal	Localized: construction of replacement employee housing in the Abbieville/Trailer Village area.	<p>This area is in known proximity of archeological and ethnographic resources.</p> <p>Consultation with traditionally associated American Indian tribes and groups would determine the best uses for the Abbieville/Trailer Village area, especially in recognition that associated American Indians have a priority agreement for the administrative group campsites.</p> <p>Consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.</p> <p>Construction or removal activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians may be warranted in some areas, especially in areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>Overall impact on traditional cultural resources under Alternative 2 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during planned actions. Removal of some buildings may also redirect visitor activity away from known sites, or provide new opportunities for traditional plant use areas.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segments 5, 6, 7, and 8 - Actions: Manage Visitor Use and Facilities</b>			
7: South Fork Merced River	Segmentwide: removal and relocation of two stock campsites from Wawona Stock Camp to the Wawona Stables area would affect traditional cultural resources.	<p>The campsites are currently located within a sensitive cultural area.</p> <p>To avoid adverse impacts, or reduce impacts, removal of the campsites should be planned in consultation with traditionally associated American Indians.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> long-term</p> <p><i>Type of impact:</i> Removal of the campsites would provide a minor to moderate benefit impact to this resource by eliminating a source of erosion and trampling. Restoration of the area would improve the integrity of the site setting.</p>

## **All River Segments**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, there would be no actions to protect and enhance river values in all river segments beyond those common to Alternatives 2–6.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, more private boaters would be allowed in Segment 2 of the Merced River, although a permit would be required. Commercial boats would be allowed with a commercial use authorization. These actions would result in a minor beneficial impact over current conditions.

Proposed changes in parking, traffic management, and public transportation under Alternative 4 would have no impact on traditional cultural resources provided that traditionally associated American Indians are guaranteed access to the park for traditional cultural events. Parking and/or public transportation fee waivers for nonrecreational use could also be required to maintain appropriate access to the park, as required under the American Indian Religious Freedom Act.

## **Segment 1: Merced River Above Nevada Fall**

### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, there would be no actions to protect and enhance river values in Segment 1 beyond those common to Alternatives 2–6.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

## **Biological Resource Actions**

Actions under Alternative 4 would reduce use at Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp. The overall impacts of the proposed actions would have the potential to both beneficially (by avoiding sites) and adversely impact known archeological sites in the vicinity of these areas.

## **Segment 2: Yosemite Valley**

### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Under Alternative 4, actions propose restoration of Stoneman Meadow and portions of the Curry Orchard parking lot. The proposed partial restoration of the Curry Orchard parking lot could have a minor beneficial impact on this resource by restoring some of the setting integrity.

Alternative 4 actions for the Yosemite Lodge area would not include removal of any buildings from the floodplain except for those included in the actions common to Alternatives 2–6. Rerouting of some trails, roads, and bicycle paths would occur, and some trail would be elevated onto boardwalks. No roads or bicycle paths would be rerouted out of meadows. These actions have the potential to impact traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources in Segment 2. Traditionally associated American Indian tribes and groups should be consulted to plan appropriate areas for reroutes and nondamaging methods for removing abandoned segments of trails.

The park would remove campsites from the East Valley campgrounds and somewhat restore the floodplain area. The proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing the native flora. Access to traditional use plant population areas should be kept open during restoration activities through consultation with traditionally associated American Indians, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies. Impacts on the ethnographic values of nearby archeological sites valued as traditional cultural resources would also be discussed during consultation.

Actions to remove facilities from Housekeeping Camp, restore habitat, and provide formal river access would be less under Alternative 4 than under Alternative 3, with some lodging units remaining and less riparian ecosystem being restored. As a large portion of Housekeeping Camp is located within an ethnohistoric village site in Segment 2, the proposed actions would potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting. Ground-disturbing activities associated with demolition and removal of facilities could inadvertently adversely impact the values of the site. Active restoration may also restrict access to the site.

**Hydrologic/Geologic Resource Actions.** Removal of the Ahwahnee and Sugar Pine bridges and rerouting of the trail between these bridges would occur. Rerouting the trail to the north of the river may result in the trail encroaching on an archeological site and an ethnohistoric village site. Consideration of this site is recommended when planning the rerouted trail location, and traditionally associated American Indian representatives may wish to monitor trail construction in this area.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Curry Village.** Removal of the Curry Village stables and associated lodging, followed by ecological restoration of the stables area, may affect native flora. To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.

**Camp 6.** Moving Camp 6 parking north from the river will facilitate riparian restoration goals. This action has a potentially beneficial impact. The Camp 6/Village Parking Area will be formalized with 750 parking places. To address traffic congestion and pedestrian/vehicle conflicts, a pedestrian underpass and roundabout will be constructed at the Village Drive/Northside Drive intersections. The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the

physical integrity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites. Consultation may result in mitigations that reduce impacts.

**Yosemite Lodge and Camp 4.** A Camp 4 shuttle stop would be constructed under Alternative 4, and would have the potential to adversely impact a number of nearby archeological and other ethnographic resources.

Under Alternative 4, predicted numbers of day and overnight visitors would be reduced compared to current peak day visitors. Intensive visitor use impacts the setting and feeling of traditional or spiritual sites and can impede access to these locations by cultural practitioners. Although visitor use can and does affect traditional use plant population areas, impacts are much more dependent on localized use specific to areas that contain these resources. A reduction in the overall visitor numbers would not necessarily reduce impacts on plant use sites. One of the most important aspects of traditional cultural association is access to park lands and resources. Under Alternative 4, American Indian access for traditional cultural events must be guaranteed, and fee waiver passes for nonrecreational uses must be honored regardless of any visitor limits. Otherwise, implementation of these actions has the potential for adversely impacting traditional cultural resources and would possibly be in conflict with the American Indian Religious Freedom Act.

Actions at Yosemite Lodge include construction of two new concessioner housing areas and employee parking spaces. Associated removal and repurposing of various facilities would potentially adversely impact the ethnographic values of a large village site (with some related archeological remains).

**Yosemite Village and Housekeeping Camp.** Under Alternative 4, some lodging units and other facilities would remain at Housekeeping Camp. The proposed removal of facilities, amenities and infrastructure would potentially have a long-term, beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the ethnohistoric village site's integrity of setting. Ground-disturbing activities associated with demolition and removal of facilities could inadvertently adversely impact the values of the site. Active restoration may also restrict access to the site.

Under Alternative 4, a number of campsites would be removed from the East Valley campgrounds, but several areas would be proposed for construction of new campgrounds. Additional walk-in, drive-in, and RV spaces would be created in areas adjacent to existing campgrounds, in areas of former campgrounds, or next to other existing facilities such as the Curry Village stables and Yosemite Lodge. These actions would result in some beneficial impacts, but also have the potential for adverse impacts on traditional cultural resources, as several of the proposed new campground areas would be constructed near known traditional use plant population areas and/or ethnographic village sites.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** The valley oak protection zone proposed under Alternative 4 would remove current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove and allow it to grow and flourish.



### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 4, the Abbieville/Trailer Village area in Segment 4 would be used for high-density replacement employee housing (258 beds) relocated from the Valley to El Portal. This area has archeological and other ethnographic resources present, and new construction would result in adverse impacts on these resources. Consultation with traditionally associated American Indian tribes and groups is recommended to determine the best uses for the Abbieville/Trailer Village area.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 4, the Wawona Golf Course would remain operational and open for use; no impacts on traditional cultural resources would occur from this use. Two stock campsites would be removed; because the campsites are currently located within a sensitive cultural area, the removal of the campsites would provide a benefit to this resource by eliminating a source of erosion and trampling, and restoration of the area would improve the integrity of the site setting.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Campsites would be removed from the Wawona Campground under Alternative 4. Impacts on ethnographically important resources would be the same as described above.

### **Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Some of the management actions proposed under Alternative 4 would have the potential to result in minor to moderate adverse impacts on known traditional cultural resources through actions related to restoration, construction, and facilities removal. These could result in short-term or long-term changes in the setting of the site, destruction of native vegetation, changes in important views, or disruption through visitor use or lack of access. Consultation with representatives from traditionally associated American Indian tribes and groups is recommended to find design solutions for specific actions that would avoid or minimize short- and long-term impacts on traditional use plant population areas, spiritual sites, ethnographic village locations, and other significant sites.

Some of the management actions associated with Alternative 4 would result in long-term, beneficial impacts on known traditional cultural resources, either through restrictions on types or amounts of visitor use that can cause damage, restrict access, or influence the setting of traditional sites, or restoration of traditional use plant population areas. Fewer existing facilities would be removed under Alternative 4, and a greater amount of new construction of campsites, parking lots, and other facilities would occur.

### **Cumulative Impacts of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

Cumulatively considerable projects that could affect American Indian traditional cultural resources are the same as those identified for Alternative 2, and include past, present, and reasonably foreseeable actions in the study area.

#### ***Overall Cumulative Impact from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration***

The combined past, present, and reasonably foreseeable future actions of the cumulative scenario would have a negligible or beneficial impact on traditional cultural resources after implementation of all associated mitigation and consultation, providing that impacts to traditional cultural resources are avoided. The proposed management actions associated with Alternatives 4, including actions common to Alternatives 2-6, may have reduced or negligible adverse impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings. Consultation with traditionally associated American Indian tribes or groups could result in mitigations that reduce cumulative impacts that may occur.

#### ***Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

To avoid or reduce adverse impacts, restoration, visitor management, and construction activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access, and avoid areas of known traditional cultural resources. Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas. If avoidance is not feasible, adverse impacts would result. Consultation may result in mitigations that reduce impacts. Text below describes actions specific to Alternative 5, and assumes that consultation and avoidance of impacts to traditional cultural resources would occur whenever possible. **Table 9-257** provides NEPA analysis of potential impacts to traditional cultural resources and recommendations for consultation.

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, there would be no actions to protect and enhance river values in all segments beyond those common to Alternatives 2-6.

**TABLE 9-257: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 5**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>All Segments - Actions: Manage Visitor Use and Facilities</b>			
All segments	Parkwide: management of swimming and boating access in all river segments under Alternative 2 would influence the traditional cultural resources related to the Merced River's setting and condition	To avoid adverse impacts, or reduce impacts, restriction of boating activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and to restore traditional cultural continuity to meadow management efforts.	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> management of access results in minor to moderate beneficial impacts.</p> <p>Eliminating commercial boating and implementing strict number restrictions on private boats within some river segments would result in the greatest beneficial impact on traditional cultural resources.</p>
All segments	Segmentwide: a progressive day use reservation system would potentially have a beneficial impact on some types of traditional cultural resources	Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources.	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> management of access results in minor to moderate beneficial impacts.</p> <p>In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. Otherwise, implementation of these actions has the potential for adversely affecting traditional cultural resources and could possibly be in conflict with the American Indian Religious Freedom Act.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
<b>Segment 1 - Actions: Manage Visitor Use and Facilities</b>			
<b>Biological Resource Actions</b>			
1: Merced River above Nevada Fall	Segmentwide: changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp	<p>Some actions are proposed in areas with known archeological sites.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities.</p> <p>Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Type of impact:</i> No ecosystem restoration would occur, and impacts on traditional cultural resources would likely be a minor beneficial impact.</p> <p><i>Type of impact:</i> If avoidance is not feasible, impacts would be negligible to minor.</p> <p>As no ecosystem restoration would occur, and impacts on traditional cultural resources would likely be a minor adverse impact.</p> <p>Consultation may result in mitigations that reduce impacts.</p>

**TABLE 9-257: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 5 (CONTINUED)**

River Segment	Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Analysis under NEPA
<b>Segment 2 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
2: Yosemite Valley	Segmentwide: rerouting trails, bicycle paths, and roads in all Yosemite Valley meadows	<p>These actions have the potential to affect traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Localized: partial restoration of the Curry Orchard Day Use Parking Area to allow for a total of 400 parking spaces.	<p>This is in the vicinity of a known ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of ethnographic resources.</p> <p>Monitoring of ground disturbing activities by American Indian representatives may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p> <p>May provide a beneficial impact on traditional use plant population areas in these Segment 2 meadows. Nearby ethnographic village and/or archeological sites would be protected from adverse impacts during ground-disturbing restoration activities</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>

**TABLE 9-257: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 5 (CONTINUED)**

River Segment	Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Analysis under NEPA
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas would affect access to native flora	<p>This is in the vicinity of known archeological sites.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing traditional plan use areas.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major</p> <p>Consultation may result in mitigations that reduce impacts.</p>
<b>Hydrologic/Geologic Resource Actions</b>			
2: Yosemite Valley	Localized: removal of Sugar Pine Bridge and the rerouting of the multiuse trail have the potential to affect an ethnohistoric site while restoring native vegetation.	<p>There is a known archeological site and ethnographic village site in this vicinity.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Bridge removal would have a beneficial impact on this resource by enhancing native vegetation species</p> <p><i>Intensity and type of impact:</i> Rerouting the trail to the north of the river may result in the trail encroaching on an ethnohistoric village site. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce impacts.</p>

**TABLE 9-257: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 5 (CONTINUED)**

River Segment	Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Analysis under NEPA
<b>Segment 2 - Actions: Manage Visitor Use and Facilities</b>			
2: Yosemite Valley	Segmentwide: Visitor use is limited through parking management. As parking reaches full capacity in the Valley, cars would be redirected to West Valley overflow parking, and then to overflow parking in El Portal and Gateway communities.	Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources.	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> In order for the establishment of a day use reservation system not to have an adverse impact on traditional cultural resources, (1) American Indian access for traditional cultural events must be guaranteed, and (2) tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. Otherwise, implementation of these actions has the potential for adversely impact access to traditional cultural resources and could possibly be in conflict with the American Indian Religious Freedom Act.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
<b>Camp 6</b>			
2: Yosemite Valley	<p>Localized: Move Camp 6 north from the river to facilitate riparian restoration goals</p> <p>Formalize Camp 6/Village Center Parking Area with 850 parking places</p> <p>Construct a pedestrian underpass and roundabout at the Village Drive/Northside Drive intersection to address traffic congestion and pedestrian/vehicle conflicts.</p>	<p>Camp 6 is in the vicinity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible impact</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major</p> <p>The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the physical integrity of the site.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
<b>Yosemite Lodge and Camp 4</b>			
2: Yosemite Valley	Localized: construction of new employee housing at Yosemite Lodge	<p>There is a known ethnohistoric village site in this vicinity.</p> <p>This action would be planned in consultation with traditionally associated American Indians. Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible impact</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major</p> <p>The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the physical integrity of the site.</p> <p>Consultation may result in mitigations that reduce impacts.</p>

**TABLE 9-257: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 5 (CONTINUED)**

River Segment	Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Analysis under NEPA
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Lodge and Camp 4 (cont.)</b>			
2: Yosemite Valley (cont.)		ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.  Monitoring by American Indian representatives of such ground disturbing activities would likely be required.	
2: Yosemite Valley	Localized: creation of additional walk-in, drive-in, and RV spaces in areas adjacent to existing campgrounds and in areas of former campgrounds	There are known traditional cultural resources in this vicinity.  Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.  Monitoring by American Indian representatives of such actions may be appropriate.	<i>Duration of Impact:</i> short- to long-term  <i>Type of impact:</i> avoidance of resources would result in minor beneficial effect  <i>Type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major  Consultation may result in mitigations that reduce impacts.
2: Yosemite Valley	Localized: construction of a shuttle stop at Camp 4 (Sunnyside Campground)	There are known ethnographic resources in this vicinity.  To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.  Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  <i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce impacts.

**TABLE 9-257: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 5 (CONTINUED)**

River Segment	Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Analysis under NEPA
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Village and Housekeeping Camp</b>			
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas	There are known traditional plan use and archeological resources in this vicinity.  Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.  Monitoring by American Indian representatives of such actions may be appropriate.	As above  Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing the native flora.
2: Yosemite Valley	Localized: construction of a roundabout to address traffic conflicts at the bank three-way intersection with Northside Drive	There are known traditional cultural resources in this vicinity.  To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.  Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.	<i>Duration of Impact: short- to long-term</i>  <i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.  <i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce impacts.
<b>Segments 3 and 4 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
4: El Portal	Localized: restriction of parking and new building construction within a protection zone around a stand of valley oaks.	To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.	<i>Duration of Impact:</i> long-term  <i>Intensity and type of impact:</i> minor to moderate beneficial impacts.  Removing current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove.



**TABLE 9-257: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 5 (CONTINUED)**

River Segment	Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Analysis under NEPA
<b>Segments 3 and 4 - Actions: Manage Visitor Use and Facilities</b>			
4: El Portal	Localized: construction of replacement employee housing in the Abbieville/Trailer Village area.	<p>This area is in known proximity of archeological and ethnographic resources.</p> <p>Consultation with traditionally associated American Indian tribes and groups would determine the best uses for the Abbieville/Trailer Village area, especially in recognition that associated American Indians have a priority agreement for the administrative group campsites.</p> <p>Consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.</p> <p>Construction or removal activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians may be warranted in some areas, especially in areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>Overall impact on traditional cultural resources under Alternative 2 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during planned actions. Removal of some buildings may also redirect visitor activity away from known sites, or provide new opportunities for traditional plant use areas.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segments 5, 6, 7, and 8 - Actions: Manage Visitor Use and Facilities</b>			
7: South Fork Merced River	Segmentwide: removal and relocation of two stock campsites from Wawona Stock Camp to the Wawona Stables area would affect traditional cultural resources.	<p>The campsites are currently located within a sensitive cultural area.</p> <p>To avoid adverse impacts, or reduce impacts, removal of the campsites should be planned in consultation with traditionally associated American Indians.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> long-term</p> <p><i>Type of impact:</i> Removal of the campsites would provide a minor to moderate benefit impact to this resource by eliminating a source of erosion and trampling. Restoration of the area would improve the integrity of the site setting.</p>

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 5, a number of private boaters would be allowed in Segment 2 of the Merced River, but a permit would be required. Commercial boats would not be allowed under Alternative 5. Fewer boaters, in particular, would provide more opportunities for other visitors to experience the river in a more traditional state. Implementing number restrictions on private boats within some river segments would result in a beneficial impact on traditional cultural resources, providing that traditionally associated American Indian tribes and groups do not have restricted access to important resources.

Under Alternative 5, a progressive day use reservation system would be implemented by the park, along with other phased traffic and parking management systems that would be activated when demand exceeds a certain level. One of the most important aspects of traditional cultural association is access to park lands and resources. To ensure that the establishment of a day use reservation system would not have an adverse impact on traditional cultural resources, American Indian access for traditional cultural events must be guaranteed, and tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. If both of these criteria are met, then it could reasonably be stated that the progressive day use reservation system proposed under Alternative 5 would not adversely affect American Indian traditional cultural resources. Otherwise, implementation of a day use reservation system has the potential to adversely affect traditional cultural resources and would possibly be in conflict with the American Indian Religious Freedom Act.

**Segment 1: Merced River Above Nevada Fall*****Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, there would be no actions to protect and enhance river values in Segment 1 beyond those common to Alternatives 2–6.

***Impacts of Actions to Manage User Capacities, Land Use, and Facilities*****Biological Resource Actions**

Under Alternative 5, there would be no reduction in use at Little Yosemite Valley Campground, although bear boxes would be removed. Bear boxes and flush toilets would also be removed from Merced Lake Backpackers Campground, and the Merced Lake High Sierra Camp would be reduced to 42 beds. No ecosystem restoration would occur, and impacts on traditional cultural resources (both beneficial and adverse) would be minor.

**Segment 2: Yosemite Valley*****Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Under Alternative 5, the actions proposed to reroute trails, roads, and bicycle paths. Some trail would be rerouted, and some trail would be elevated onto boardwalks. No roads or bicycle paths would be rerouted out of meadows. Traditionally associated American Indian

tribes and groups should be consulted to plan appropriate areas for reroutes and nondamaging methods for removing abandoned segments of trails.

There would be no restoration of Stoneman Meadow under Alternative 5; instead, the Curry Orchard parking lot would be redesigned to improve drainage and hydrologic connectivity in Stoneman Meadow. The proposed partial restoration of the Curry Orchard parking lot could have a slight beneficial impact on this resource by restoring some of the setting integrity.

Under Alternative 5, the park would remove some campsites from the East Valley campgrounds and restore less floodplain area. The floodplains of the East Valley campgrounds contain traditional use plant population areas. The removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a local, long-term, minor beneficial impact on traditional cultural resources by increasing and enhancing the native flora. Monitoring of ground disturbing activities by American Indian representatives may be required.

Actions to remove facilities from Housekeeping Camp, restore habitat, and provide formal river access would leave most lodging units and only 1 acre of riparian ecosystem would be restored. The removal of facilities and infrastructure and restoration of floodplain and riparian habitat would potentially have a local, long-term, minor beneficial impact on traditional cultural resources by reducing the intensity of use and thereby improving the site's integrity of setting. Ground-disturbing activities associated with demolition and removal of facilities could inadvertently adversely impact the values of the site. Active restoration may also restrict access to the site.

Under Alternative 5, actions in the Yosemite Lodge area would not include removal of any buildings from the floodplain except for those included in the actions common to Alternatives 2–6.

**Hydrologic/Geologic Resource Actions.** Under Alternative 5, only the Sugar Pine Bridge would be removed and the adjacent multiple use trail would be rerouted to the north. The Ahwahnee Bridge would remain. Rerouting the trail to the north of the river may result in the trail encroaching on traditional cultural resources. Consideration of this site is recommended when planning the rerouted trail location, and traditionally associated American Indian representatives may wish to monitor trail construction in this area.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Camp 6.** Moving Camp 6 parking north from the river will facilitate riparian restoration goals. This action has a potentially beneficial impact. The Camp 6/Village Parking Area will be formalized with 750 parking places. To address traffic congestion and pedestrian/vehicle conflicts, a pedestrian underpass and roundabout will be constructed at the Village Drive/Northside Drive intersections. The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the physical integrity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites. Consultation may result in mitigations that reduce impacts. Actions (and impacts) at Yosemite Lodge would be the same under Alternative 5 as under Alternative 4, including the construction of two new concessioner housing areas and employee parking spaces. Associated removal and repurposing of various facilities would potentially affect the ethnographic values of a large village site (with some related archeological remains).

**Yosemite Lodge and Camp 4.** The proposed construction of a shuttle stop at Camp 4 would have the potential to adversely affect a number of nearby archeological and other ethnographic resources.

Construction of new employee housing at Yosemite Lodge would potentially adversely impact a known ethnohistoric village site in this vicinity. This action would be planned in consultation with traditionally associated American Indians. Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of traditional cultural resources.

Under Alternative 5, predicted numbers of day and overnight visitors would be approximately the same as current peak day demand. Intensive visitor use affects the setting and feeling of traditional or spiritual sites and can impede access to these locations by cultural practitioners. Although visitor use can and does affect plant traditional use plant population areas, impacts are much more dependent on localized use specific to areas that contain these resources. A change in the overall visitor numbers would not necessarily alter impacts on traditional use plant population areas. One of the most important aspects of traditional cultural association is access to park lands and resources. Under Alternative 5, American Indian access for traditional cultural events must be guaranteed, and fee waiver passes for nonrecreational uses must be honored regardless of any progressive day use reservation system or visitor limits. Otherwise, implementation of these actions has the potential for adversely affecting traditional cultural resources and would possibly be in conflict with the American Indian Religious Freedom Act.

**Yosemite Village and Housekeeping Camp.** Under Alternative 5, most lodging units and other facilities would remain at Housekeeping Camp. There would be no measurable beneficial impacts over present conditions, but adverse impacts related to continued high-intensity visitor use of the area would still occur, as described for Alternative 1.

Under Alternative 5, some campsites would be removed from the East Valley campgrounds. Several areas would be proposed for the construction of new campgrounds. Additional walk-in, drive-in, and RV spaces would be created in areas adjacent to existing campgrounds and in areas of former campgrounds, but not next to other existing facilities. Several traditional use plant population areas are located in and around the current campgrounds, and these areas would potentially be affected by the proposed actions. To avoid adverse impacts during restoration activities, unrestricted access to these areas should be maintained for traditionally associated American Indians, as well as consultation on traditional land management strategies.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** The proposed actions to restrict parking and new building construction within a protection zone around a stand of valley oaks in Segment 4 would result in a beneficial impact for these trees. Removing current facilities and imported fill, then decompacting soils and revegetating

with native oak-compatible understory species would improve the health of this grove and allow it to grow and flourish.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Any construction of replacement employee housing would adversely affect archeological and other traditional cultural resources in the Abbeville/Trailer Village area. This area has archeological and other traditional cultural resources present, and new construction would likely result in local, long-term adverse impacts on these resources. Consultation with traditionally associated American Indian tribes and groups would determine the best uses for the Abbeville/Trailer Village area, especially in recognition that associated American Indians have a priority agreement for the administrative group campsites. Consultation may result in mitigations that reduce impacts.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 5, the Wawona Golf Course would remain open. Two stock campsites would be removed from the Wawona stock camp, but under Alternative 5 these campsites would be relocated to the Wawona Maintenance area. Because the campsites are currently located within a sensitive cultural area, the removal of the campsites would provide a benefit to this resource by eliminating a source of erosion and trampling, and restoration of the area would improve the integrity of the site setting.

### **Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Some of the management actions proposed under Alternative 5 would have the potential to result in minor to moderate adverse impacts on known American Indian traditional cultural resources through actions related to restoration, construction, and facilities removal. These could result in short-term or long-term changes in the setting of the site, destruction of native vegetation, changes in important views, or disruption through visitor use or lack of access. Consultation with representatives from traditionally associated American Indian tribes and groups is recommended to find design solutions for specific actions in order to minimize short-term impacts and avoid long-term impacts on traditional use plant population areas, spiritual sites, ethnographic village locations, and other significant sites.

Some of the Alternative 5 management actions would result in long-term, beneficial impacts on known American Indian traditional cultural resources, either through restrictions on types or amounts of visitor use that can cause damage, restrict access, or influence the setting of traditional sites, or restoration of traditional use plant population areas.

### **Cumulative Impacts of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

Cumulatively considerable projects that could affect American Indian traditional cultural resources are the same as those identified for Alternative 2, and include past, present, and reasonably foreseeable actions in the study area.

#### ***Overall Cumulative Impact from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration***

The combined past, present, and reasonably foreseeable future actions of the cumulative scenario would have a negligible or beneficial impact on traditional cultural resources after implementation of all associated mitigation and consultation, providing that impacts to traditional cultural resources are avoided. The proposed management actions associated with Alternatives 5, including actions common to Alternatives 2-6, may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings. Consultation with traditionally associated American Indian tribes or groups could result in mitigations that reduce cumulative impacts that may occur.

#### ***Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

To avoid or reduce adverse impacts, restoration, visitor management, and construction activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access, and avoid areas of known traditional cultural resources. Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas. If avoidance is not feasible, adverse impacts would result. Consultation may result in mitigations that reduce impacts. Text below describes actions specific to Alternative 6, and assumes that consultation and avoidance of impacts to traditional cultural resources would occur whenever possible. Table 9-258 provides NEPA analysis of potential impacts to traditional cultural resources and recommendations for consultation.

### **All River Segments**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, there would be no actions to protect and enhance river values in all river segments beyond those common to Alternatives 2-6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

Under Alternative 6, the largest number of boats would be allowed on the Wild and Scenic River area of the Merced River out of Alternatives 2-6. Permits would be required for private boats, and commercial boats would be allowed by concessioners.

**TABLE 9-258: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 6**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>All Segments - Actions: Manage Visitor Use and Facilities</b>			
1: Merced River above Nevada Fall	Segmentwide: changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp	<p>Some actions are proposed in areas with known archeological sites.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities.</p> <p>Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to moderate beneficial impact.</p> <p>Overall impact on traditional cultural resources could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during restoration activities.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>As an example, construction may result in disruption of ethnobotanical species' habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
1: Merced River above Nevada Fall	Segmentwide: changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp	<p>Some actions are proposed in areas with known archeological sites.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities.</p> <p>Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to moderate beneficial impact.</p> <p>Overall impact on traditional cultural resources could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during restoration activities.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>As an example, construction may result in disruption of ethnobotanical species' habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>

**TABLE 9-258: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 1 - Actions: Manage Visitor Use and Facilities</b>			
<b>Biological Resource Actions</b>			
1: Merced River above Nevada Fall	Segmentwide: changes to the Little Yosemite Valley Campground, Merced Lake Backpackers Campground, and Merced Lake High Sierra Camp	<p>Some actions are proposed in areas with known archeological sites.</p> <p>To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities.</p> <p>Monitoring by traditionally associated American Indians of activities would likely be warranted in some areas of ground disturbing activities.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to moderate beneficial impact.</p> <p>Overall impact on traditional cultural resources could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during restoration activities.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>As an example, construction may result in disruption of ethnobotanical species' habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segment 2 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
2: Yosemite Valley	Segmentwide: rerouting trails, bicycle paths, and roads in all Yosemite Valley meadows	<p>These actions have the potential to affect traditional cultural resources, including archeological sites, traditional use plant population areas, or other American Indian traditional cultural resources</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of archeological and ethnographic resources, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.</p> <p>Monitoring by American Indian representatives of such ground disturbance would be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>



**TABLE 9-258: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions</b>			
2: Yosemite Valley	Localized: partial restoration of the Curry Orchard Day Use Parking Area to allow for a total of 400 parking spaces.	<p>This is in the vicinity of a known ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to physical disturbance of ethnographic resources.</p> <p>Monitoring of ground disturbing activities by American Indian representatives may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in negligible to moderate beneficial impact.</p> <p>May provide a beneficial impact on traditional use plant population areas in these Segment 2 meadows. Nearby ethnographic village and/or archeological sites would be protected from adverse impacts during ground-disturbing restoration activities</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Localized: removal of campsites and asphalt and restoration of native vegetation within the East Valley campground areas would affect access to native flora	<p>This is in the vicinity of known archeological sites.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, beneficial impact on traditional cultural resources by increasing and enhancing traditional plan use areas.</p> <p><i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
2: Yosemite Valley	Localized: removal of buildings in the Yosemite Lodge floodplain	<p>This has the potential to affect a large ethnohistoric village site.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p>Removal of unused facilities and restoration of vegetation would ultimately provide a long-term benefit for the site by restoring some of its traditional setting,</p>

**TABLE 9-258: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Protect and Enhance River Values (cont.)</b>			
<b>Biological Resource Actions (cont.)</b>			
2: Yosemite Valley (cont.)			<i>Intensity and type of impact:</i> proposed actions (specifically, recontouring the ground surface) has the potential to affect both the physical integrity of the site. If avoidance is not feasible, impacts would be minor, moderate, to major.  Consultation may result in mitigations that reduce adverse impacts.
2: Yosemite Valley	Local: removal of facilities in Housekeeping Camp	As above	As above
<b>Segment 2 - Actions: Manage Visitor Use and Facilities</b>			
2: Yosemite Valley	Segmentwide: no reduction of the numbers of day use and overnight visitors is proposed under Alternative 6 in Segment 2.	Intensive visitor use impacts the setting and feeling of traditional or spiritual sites, and can impede access to these locations by cultural practitioners.  Project planners would consult with traditionally associated American Indian tribes and groups to determine the course of action that would result in the least adverse impacts on traditional cultural resources.	<i>Duration of Impact:</i> short- to long-term  <i>Type of impact:</i> avoidance of resources would result in negligible impact and beneficial impact  <i>Type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major  Consultation may result in mitigations that reduce impacts.
<b>Camp 6</b>			
2: Yosemite Valley	Localized: Move Camp 6 north from the river to facilitate riparian restoration goals  Formalize Camp 6/Village Center Parking Area with 850 parking places  Construct a pedestrian underpass and roundabout at the Village Drive/Northside Drive intersection to address traffic congestion and pedestrian/vehicle conflicts.	Camp 6 is in the vicinity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites.  Consultation with traditionally associated American Indians is recommended for any actions that would involve use of heavy machinery or temporary restrictions on access to ethnographically sensitive areas. This would help to avoid any adverse impacts related to continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies.	<i>Duration of Impact:</i> short- to long-term  <i>Intensity and type of impact:</i> avoidance of resources results in negligible impact  <i>Intensity and type of impact:</i> If avoidance is not feasible, impacts would be minor, moderate, to major  The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the physical integrity of the site.  Consultation may result in mitigations that reduce impacts.

**TABLE 9-258: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Lodge and Camp 4</b>			
2: Yosemite Valley	Localized: construction of new employee housing and lodge redesign at Yosemite Lodge	<p>There are known ethnographic resources in this vicinity.</p> <p>To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact: short- to long-term</i></p> <p><i>Intensity and type of impact:</i> avoidance of resources and rerouting away from traditional cultural resources results in minor to moderate beneficial impact.</p> <p><i>Intensity and type of impact:</i> Demolition and ground disturbing activities has the potential to adversely impact the physical integrity of known sites. If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Consultation may result in mitigations that reduce impacts.</p>
2: Yosemite Valley	Local: construction of new walk-in, drive-in, and RV spaces adjacent to existing campgrounds and in areas of former campgrounds within the East Valley	<p>There are known traditional use plant areas and archeological sites in the vicinity.</p> <p>Consultation with traditionally associated American Indian tribes and groups would be conducted prior to the commencement of this type of work.</p> <p>Monitoring by American Indian representatives of such actions may be appropriate.</p>	As above
2: Yosemite Valley	Localized: construction of a shuttle stop at Camp 4 (Sunnyside Campground)	<p>There are known ethnographic resources in this vicinity.</p> <p>To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	As above

**TABLE 9-258: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segment 2 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
<b>Yosemite Lodge and Camp 4 (cont.)</b>			
2: Yosemite Valley	Local: Construction of Bank three-way intersection and a roundabout at the intersection with Northside Drive	<p>There are known ethnographic resources in this vicinity</p> <p>To avoid adverse impacts, or reduce impacts, construction activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of ground disturbing activities by traditionally associated American Indians would likely be warranted in some areas.</p>	As above
<b>Segments 3 and 4 - Actions: Protect and Enhance River Values</b>			
<b>Biological Resource Actions</b>			
4: El Portal	Localized: restriction of parking and new building construction within a protection zone around a stand of valley oaks.	To avoid adverse impacts, or reduce impacts, restoration activities should be planned in consultation with traditionally associated American Indians.	<p><i>Duration of Impact:</i> long-term</p> <p><i>Intensity and type of impact:</i> minor to moderate beneficial impacts.</p> <p>Removing current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove.</p>
<b>Segments 3 and 4 - Actions: Manage Visitor Use and Facilities</b>			
4: El Portal	Localized: construction of replacement employee housing in the Abbieville/Trailer Village area.	<p>This area is in known proximity of archeological and ethnographic resources.</p> <p>Consultation with traditionally associated American Indian tribes and groups would determine the best uses for the Abbieville/Trailer Village area, especially in recognition that associated American Indians have a priority agreement for the administrative group campsites.</p> <p>Consultation with traditionally associated American Indian tribes and groups is recommended during the planning stages.</p>	<p><i>Duration of Impact:</i> short- to long-term</p> <p><i>Intensity and type of impact:</i> avoidance of resources results in negligible to major beneficial impacts.</p> <p>Overall impact on traditional cultural resources under Alternative 2 could be beneficial, provided that physical impacts on archeological, ethnographic, and other sites valued as traditional cultural resources could be avoided during planned actions. Removal of some buildings may also redirect visitor activity away from known sites, or provide new opportunities for traditional plant use areas.</p>

**TABLE 9-258: PROPOSED ACTIONS AND IMPACTS UNDER ACTIONS COMMON TO ALTERNATIVE 6 (CONTINUED)**

River Segment	Context of Proposed Actions and Impacts to Resources	Consultation with Traditionally Associated American Indian Tribes or Groups	Duration, Intensity, and Type of Impact
<b>Segments 3 and 4 - Actions: Manage Visitor Use and Facilities (cont.)</b>			
4: El Portal (cont.)		<p>Construction or removal activities would be planned in consultation with traditionally associated American Indians to ensure uninterrupted access to ethnographic resources during these activities, and avoid known traditional cultural resource.</p> <p>Monitoring of activities by traditionally associated American Indians may be warranted in some areas, especially in areas of ground disturbing activities.</p>	<p><i>Intensity and type of impact:</i> If avoidance is not feasible, adverse impacts would be minor, moderate, to major.</p> <p>Construction and removal may result in disruption of ethnobotanical species' habitats, and may be an adverse impact.</p> <p>Consultation may result in mitigations that reduce adverse impacts.</p>
<b>Segments 5, 6, 7, and 8 - Actions: Manage Visitor Use and Facilities</b>			
7: South Fork Merced River	Segmentwide: removal and relocation of two stock campsites from Wawona Stock Camp to the Wawona Stables area would affect traditional cultural resources.	<p>The campsites are currently located within a sensitive cultural area.</p> <p>To avoid adverse impacts, or reduce impacts, removal of the campsites should be planned in consultation with traditionally associated American Indians.</p> <p>Monitoring of activities by traditionally associated American Indians would likely be warranted in some areas.</p>	<p><i>Duration of Impact:</i> long-term</p> <p><i>Type of impact:</i> Removal of the campsites would provide a minor to moderate benefit impact to this resource by eliminating a source of erosion and trampling. Restoration of the area would improve the integrity of the site setting.</p>

Under Alternative 6, a progressive day use reservation system would be implemented by the park, along with other phased traffic and parking management systems that would be activated when demand exceeds a certain level. One of the most important aspects of traditional cultural association is access to park lands and resources. To ensure that the establishment of a day use reservation system would not have an adverse impact on traditional cultural resources, American Indian access for traditional cultural events must be guaranteed, and tribal fee waiver passes for nonrecreational uses must be honored regardless of any day use reservation system in place. If both of these criteria are met, then it could reasonably be stated that the progressive day use reservation system proposed under Alternative 6 would not adversely impact American Indian traditional cultural resources. Otherwise, implementation of a day use reservation system has the potential to adversely affect traditional cultural resources and would possibly be in conflict with the American Indian Religious Freedom Act.

### **Segment 1: Merced River Above Nevada Fall**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, there would be no actions to protect and enhance river values in Segment 1 beyond those common to Alternatives 2–6.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Biological Resource Actions.** Under Alternative 6, there would be no reduction in use at Little Yosemite Valley Campground, although bear boxes would be removed. Bear boxes and flush toilets would also be removed from Merced Lake Backpackers Campground, and the Merced Lake High Sierra Camp would be reduced to 60 beds. No ecosystem restoration would occur, and impacts on traditional cultural resources (both beneficial and adverse) would likely be minimal.

### **Segment 2: Yosemite Valley**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Proposed actions under Alternative 6 include: rerouting of trails, roads, and bicycle paths in Segment 2; redesign of Curry Orchard parking lot; restoration and campsite removal actions at East Valley campgrounds; actions to remove facilities from Housekeeping Camp. For these actions, impacts could occur on ethnographic resources, both beneficial and adverse. The proposed partial redesign of the Curry Orchard parking lot could have a slight beneficial impact on this resource by restoring some of the setting integrity. Traditionally associated American Indian tribes and groups should be consulted to plan appropriate areas for reroutes and nondamaging methods for removing abandoned segments of trails and campsites.

Under Alternative 6, actions for the Yosemite Lodge area include removal of buildings in the floodplain and recontouring/restoration, and a new parking lot would be added for lodging units. While removal of unused facilities and restoration of vegetation would ultimately provide a long-term benefit for the site by restoring some of its traditional setting, the proposed actions (specifically,

recontouring the ground surface) has the potential to affect both the physical integrity of the site, if archeological remains are present, and the ethnographic value of the resource.

**Hydrologic/Geologic Resource Actions.** Under Alternative 6, both the Sugar Pine and Ahwahnee bridges would remain and the multiuse trail between these bridges would also stay in its current alignment.

### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

**Camp 6.** Moving Camp 6 parking north from the river will facilitate riparian restoration goals. This action has a potentially beneficial impact. The Camp 6/Village Parking Area will be formalized with 850 parking places. To address traffic congestion and pedestrian/vehicle conflicts, a pedestrian underpass and two roundabout will be constructed at the Village Drive/Northside Drive intersections. The proposed actions (specifically, ground disturbance and recontouring) have the potential to affect the physical integrity of known ethnohistoric village sites, traditional use plant population areas, and/or archeological sites. Consultation may result in mitigations that reduce impacts. Associated removal and repurposing of various facilities would potentially impact the ethnographic values of a large village site (with some related archeological remains).

**Yosemite Lodge and Camp 4.** Actions at Yosemite Lodge include construction of two new concessioner housing areas and employee parking spaces. In addition, the lodge would be redesigned out of the floodplain, and a new three-story building would be constructed with 44 lodging units. This construction would have the potential to adversely impact known traditional cultural resources in the immediate vicinity of Yosemite Lodge.

A Camp 4 shuttle stop and Bank three-way intersection roundabout would be constructed under Alternative 6, and a roundabout would be constructed at the three-way intersection with Northside Drive. Because this roundabout would also be located in a sensitive ethnographic area, potential adverse impacts would be possible. Consultation would be recommended.

Under Alternative 6, available parking and lodging for day use and overnight visitors would meet the current peak day demand and the projected demand for the next five years, allowing for 3% annual growth. Intensive visitor use affects the setting and feeling of traditional or spiritual sites, and can impede access to these locations by cultural practitioners. Although visitor use can and does affect traditional use plant population areas, impacts are much more dependent on localized use specific to areas that contain these resources. A change in the overall visitor numbers would not necessarily alter impacts on plant use sites. One of the most important aspects of traditional cultural association is access to park lands and resources. Under Alternative 6, American Indian access for traditional cultural events in Segment 2 must be guaranteed, and fee waiver passes for nonrecreational uses must be honored regardless of any progressive day use reservation system or visitor limits. Otherwise, implementation of these actions has the potential to adversely affect traditional cultural resources and would possibly be in conflict with the American Indian Religious Freedom Act.

**Yosemite Village and Housekeeping Camp.** Under Alternative 6, most lodging units and all other facilities would remain at Housekeeping Camp. There would be negligible beneficial impacts over existing conditions, but minor, adverse impacts on traditional cultural resources related to continued

high-intensity visitor use of the area would still occur. Under Alternative 6, some campsites would be removed from the East Valley campgrounds. Several areas would be proposed for the construction of new campgrounds. New walk-in, drive-in, and RV spaces would be added in areas adjacent to existing campgrounds and in areas of former campgrounds, as well as near Yosemite Lodge, but no campsites would be constructed at the Curry Village stables. The proposed removal of campsites and asphalt and restoration of native vegetation within the campground areas would ultimately provide a long-term, minor beneficial impact on traditional cultural resources by increasing and enhancing the native flora. Access to traditional use plant population areas should be kept open during restoration activities through consultation with traditionally associated American Indians, allow for continuous access to traditional use plant population areas for seasonal uses, and promote cultural continuity of land management strategies. Impacts on the ethnographic values of nearby archeological sites valued as traditional cultural resources would also be discussed during consultation. Traditionally associated American Indian tribes and groups should be consulted to plan appropriate areas for new construction.

### **Segments 3 and 4: Merced River Gorge and El Portal**

#### ***Impacts of Actions to Protect and Enhance River Values***

**Biological Resource Actions.** Under Alternative 6, there would also be a proposed valley oak protection zone. Removing current facilities and imported fill, then decompacting soils and revegetating with native oak-compatible understory species would improve the health of this grove and allow it to grow and flourish.

#### ***Impacts of Actions to Manage User Capacities, Land Use, and Facilities***

The proposed housing at the Abbieville/Trailer Village area in Segment 4 under Alternative 6 would include high-density units for 258 employees and remote parking for 200 vehicles. This area has archeological and other traditional cultural resources present, and new construction would likely result in adverse impacts on these resources. Consultation with traditionally associated American Indian tribes and groups would determine the best uses for the Abbieville/Trailer Village area.

### **Segments 5, 6, 7, and 8: South Fork Merced River**

#### ***Impacts of Actions to Protect and Enhance River Values***

Under Alternative 6, the Wawona Golf Course would remain open, and two stock campsites would be relocated from the Wawona stock camp to the Wawona stables. Because the campsites are currently located within a sensitive cultural area, the removal of the campsites would provide a benefit to this resource by eliminating a source of erosion and trampling, and restoration of the area would improve the integrity of the site setting.



### **Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Some of the management actions proposed under Alternative 6 would have the potential to result in minor to moderate adverse impacts on known American Indian traditional cultural resources through actions related to restoration, construction, and facilities removal. These could result in short-term or long-term changes in the setting of the site, destruction of native vegetation, changes in important views, or disruption through visitor use or lack of access. Consultation with representatives from traditionally associated American Indian tribes and groups to find design solutions for specific actions would avoid or reduce short-term and long-term impacts on traditional use plant population areas, spiritual sites, ethnographic village locations, and other significant sites.

Some of the management actions associated with Alternative 6 would result in long-term beneficial impacts to known American Indian traditional cultural resources, either through restrictions on types or amounts of visitor use that can cause damage, restrict access, or influence the setting of traditional sites, or traditional use plant population areas.

### **Cumulative Impacts of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

Cumulatively considerable projects that could affect American Indian traditional cultural resources are the same as those identified for Alternative 2, and include past, present, and reasonably foreseeable actions in the study area.

### ***Overall Cumulative Impact from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration***

The combined past, present, and reasonably foreseeable future actions of the cumulative scenario would have a negligible or beneficial impact on traditional cultural resources after implementation of all associated mitigation and consultation, providing that impacts to traditional cultural resources are avoided. The proposed management actions associated with Alternatives 6, including actions common to Alternatives 2-6, may have reduced or negligible adverse impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings. Consultation with traditionally associated American Indian tribes or groups could result in mitigations that reduce cumulative impacts that may occur.

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## GROWTH INDUCEMENT

### Affected Environment

The purpose of this section is to disclose whether the alternatives of the *Merced River Plan/DEIS* is likely to foster additional growth, either directly or indirectly. The fact that a project may result in additional growth does not imply that such growth is either detrimental or beneficial. For example, actions that advance the purpose and need of the plan would likely be considered beneficial. Conversely, a project that fosters growth that would conflict with the goals and policies would likely be considered detrimental.

This section evaluates the potential growth inducement consequences of the management actions contained in each alternative and how the alternatives could affect the regional economy. As documented in the “Visitor Experience/Recreation” section of this chapter, there were 3.9 million annual visitors to Yosemite National Park in 2010 and 3.95 million in 2011, slightly fewer than the all-time record of 4.0 million in 1996. Yosemite visitors spend millions of dollars on entrance fees, campgrounds, hotel lodging, meals, transportation, and other goods and services both inside the park and in gateway communities outside the park. As a result, visitor spending is an important source of income and employment for the park, the primary park concessioner, and the gateway communities. In addition, the National Park Service (NPS) operating budget pays employees and contractors to perform duties and provide services within the park, which, like visitor spending, provides revenue to support the economy of the surrounding region.

The region affected by the park includes the four surrounding counties: Madera, Mariposa, Mono, and Tuolumne. As part of the socioeconomic analysis, economic and statistical profiles were developed for each county to assess the importance of tourism and NPS spending to the region. The profiles provide an economic baseline with detailed information on the size of each county’s principal economic sectors in terms of economic output, employment, and other relevant economic indicators.

### *Regional Economy*

The region evaluated in the socioeconomic analyses below includes all the gateway communities immediately adjacent to Yosemite National Park and the four counties that house them: Madera, Mariposa, Mono, and Tuolumne. The four main access roads to the park pass through the four gateway counties; Highway 41 passes through Madera and Mariposa counties, Highway 140 passes through Mariposa County, Highway 120 east passes through Mono County, and Highway 120 west passes through Tuolumne County.

Yosemite National Park is located primarily in Mariposa and Tuolumne counties, with a small southern portion in Madera County. The developed areas along the main river corridor and the South Fork Merced River, including Yosemite Valley, the El Portal Administrative Site, and Wawona are located within the jurisdiction of Mariposa County. Merced, Stanislaus, San Joaquin, and Fresno Counties were excluded from the affected region because, in these much more populous and urbanized counties, it is difficult to distinguish the portions of the tourist economies that are associated with

Yosemite versus other tourist destinations. Also, tourism is a relatively small component of these counties' overall economies.

### ***Regional Comparison***

#### **Population**

In 2010 the population of the region of economic study was almost 240,000. The socioeconomic section of this chapter provides details of the historical growth rates for this region during the past 40 years. The region containing the gateway communities to Yosemite National Park has been growing much more rapidly than the state of California as a whole, though it is important to note that this regional growth percentage is relative to the small baseline of four counties that are largely rural in character.

As described in the Socioeconomic section, substantial growth is projected to continue into the future, both in the region of impact and in the state as a whole. However, incomes in all four of the counties are less than the average for California as a whole. Per-capita incomes are lowest in Madera County, though household sizes tend to be larger; therefore, with more potential workers per household, household incomes in Madera are comparable to those in the neighboring counties. The poverty rate is also the highest in Madera County.

#### **Employment**

As further described in the Socioeconomics section of this section, the total employment was approximately 102,000 in the four-county area in 2010. Madera County, with the largest and most urbanized population, had the largest employment base in the region, accounting for approximately 57% of total employment. Mariposa County, which includes Yosemite Valley, El Portal, and Wawona, accounted for approximately 8% of total employment in the affected region. The Service sector, which includes most of the businesses most directly impacted by tourism and visitor spending, accounts for 45% of the total region, and 59% of Mariposa County, which includes Yosemite Valley.

According to the Local Area Unemployment Statistics program of the U.S. Bureau of Labor Statistics, in 2010 the total civilian labor force in the four-county region was 106,429, of which 90,509 were employed. The statewide unemployment rate in California at the time was 12.4%. Only Mariposa County was slightly better off with an unemployment rate of 12.1%. The other three counties were between 14.0% and 15.6% (with the highest in the most populous county, Madera). The region's average unemployment rate in 2010 was 14.8%.

#### **Economic Output**

Economic output is a measure of productivity. Measures of economic output vary, depending on the Industry sector. For the Agricultural and Trade sectors, output is measured by the value of products sold. In the Manufacturing sector, output is a measure of the value added by the manufacturer or the value of shipments. In the Service sector, output is measured as receipts in dollars. In 2010, the estimated total output of goods and services for the four-county region was approximately

\$12.5 billion. Madera and Tuolumne counties, which are more urbanized with cities such as Madera and Sonora, produce the majority of the region's economic output. The almost entirely rural counties of Mariposa and Mono contributed only 16% of the output. However, 57% of Mariposa's output was generated in the tourism-heavy services sector.

### ***Madera County***

According to the California Employment Development Department, almost a quarter of Madera County employment (23%) was on farms in 2010. When the Food Processing, Service, and Trade sectors of the economy are considered as well, agriculture's dominance in Madera County is obvious. The Leisure and Hospitality sector of the economy accounted for a little more than 6% of the jobs. Federal employment amounted to 300 jobs, or approximately 0.7% of county employment. In terms of fiscal resources, the transient occupancy tax only accounts for approximately 1% of Madera County's General Fund.

Madera County reaches from the crest of the Sierra Nevada range to the San Joaquin River on the Central Valley floor. The majority of the county's population and employment are concentrated along the Highway 99 corridor in the Central Valley. None of the developed parts of Yosemite National Park are in Madera County, but the county includes the headwaters of both the South Fork and the main stem of the Merced River in the high country at the southern end of the park. Because of its large geographic size and diversity of the economy of Madera County, tourism associated with the park is not particularly important to the county as a whole. On the other hand, the eastern communities in the county, specifically Oakhurst and Bass Lake, are much more dependent on Yosemite tourism.

### ***Mariposa County***

According to the Employment Development Department, tourism is Mariposa County's main industry and the area's largest employer, with more than a third (37%) of all jobs in the Leisure and Hospitality sector in 2010. The county's primary recreation area/tourist attraction is Yosemite National Park, much of which lies within the county, including the developed areas of Yosemite Valley, Wawona, and El Portal Administrative Site. Other major recreation areas in Mariposa County include Stanislaus National Forest and Sierra National Forest, as well as the U.S. Forest Service/Bureau of Land Management recreation areas along the Merced River. Other recreation resources in Mariposa County include Lake Don Pedro, Lake McSwain, and Lake McClure where camping is available.

Mariposa County's economy is very different than Madera County's. Less than 1% of Mariposa employment is on farms. In contrast, with the national park and forests, federal employment is much more important, accounting for approximately 800 jobs or 16% of county employment in 2010.

From a fiscal standpoint, Mariposa is the most dependent on tourism of the four counties. Almost a quarter of the \$42 million Mariposa County General Fund is derived from the Transient Occupancy Tax (TOT), or approximately \$10 million in the most recent fiscal year. The TOT is levied at the rate of 10% of the room rate and is collected from Bed and Breakfasts and transient rentals (e.g., Vacation Rentals by Owner), as well as from traditional hotels and motels. In addition, there is another 1% tax on transient rooms in the form of a Tourism Business Improvement District Assessment (TBID). All of

the accommodations in Yosemite Valley, as well as those in Wawona, contribute to Mariposa's General Fund through the TOT and generate money for the TBID, as well.

Another way to look at it is Mariposa County collects 62% of the entire TOT generated within the four-county region.

### ***Mono County***

Mono County is one of the least populated counties in California and is the gateway county for visitors entering through the eastern park entrance. Park access via this entrance is limited in the winter because the entrance is typically closed from November to late May as a result of snowfall. Lodging, food, beverage, and other services are central to Mono County's economy, which is also bolstered by extensive natural resources and recreational opportunities.

According to Employment Development Department data for 2010, the Leisure and Hospitality sector accounted for almost half (49%) of all employment in Mono County. Federal employment constituted approximately 200 jobs or about 3% of all employment.

Mono County only collects about \$2 million per year in Transient Occupancy Taxes, but because it is such a small county, that amount constitutes 7% of the county's General Fund.

### ***Tuolumne County***

The Tuolumne River watershed portion of Yosemite National Park is in the southeastern portion of Tuolumne County. The county also contains significant national forest lands and the Emigrant Wilderness, with recreation destinations scattered throughout. In addition to Yosemite, other recreational attractions in Tuolumne County include Columbia State Park, Stanislaus National Forest, Dodge Ridge Ski Area, and Pinecrest Lake.

The bulk of Tuolumne County's economy is clustered on private lands along Highways 49 and 108, as well as centered in the town of Sonora. According to the Employment Development Department, the Leisure and Hospitality sector accounted for about 12% of the jobs in Tuolumne County in 2010. Federal employment was approximately 400 jobs at that time, or about 3% of county jobs. The TOT in Tuolumne County generates about \$2 million per year, representing approximately 4% of the General Fund.

### ***Trends in Visitation to the Park***

Visitation grew explosively at the beginning of the 20th century, only to crash along with the economy in the early 1930s. Then, growth began again, only to be halted by World War II. The post-war era showed strong, long-term growth, peaking in 1996. In 1987, when the Merced was designated a Wild and Scenic River, visitation to the park stood at 3.2 million. The effects of the flood in early 1997, which dramatically reduced the inventory of overnight accommodations in Yosemite Valley, can be seen over the subsequent decade. The strong growth trend observed prior to 1997 can be seen again in recent years.

## ***Growth-Inducing Impacts***

While not required under NEPA, the California Environmental Quality Act (CEQA), section 15126.2(d), requires a discussion of the potential for a proposed plan to foster economic or population growth, including ways in which a project could remove an obstacle to growth. Specifically, Section 15126.2(d) requires that plans discuss “the ways in which the proposed project could foster economic development or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment . . . [and also] discuss the characteristics of some projects which may encourage and facilitate other activities that could substantially affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment.”

A growth-inducing project would directly or indirectly

- foster economic or population growth or additional housing
- remove obstacles to growth
- tax community services or facilities to such an extent that new services or facilities would be necessary
- encourage or facilitate other activities that cause significant environmental effects

Proposed management actions for Alternatives 2–6 will be evaluated in terms of the context, intensity, and duration of socioeconomic impacts and whether impacts were considered beneficial or adverse to the socioeconomic environment.

- **Context.** The context of the impact considers whether the impact would be local or regional. Like the analysis under socioeconomic, the analysis of growth inducement differs from other resource areas in that even “local” impacts are not confined to any one river segment. For purposes of this analysis, local impacts would be those that occur parkwide within Yosemite National Park. Regional impacts would be impacts in the four-county area around the park (Tuolumne, Mono, Mariposa, and Madera), including all gateway communities. Growth Inducement will be discussed under the heading of “All River Segments.”
- **Intensity.** The intensity of the impact considers whether effects would be negligible, minor, moderate, or major.
  - ***Negligible*** impacts are considered not detectable and are expected to have no discernible effect on growth.
  - ***Minor*** impacts are slightly detectable and are not expected to have an overall effect on the character of the social and economic environment and on local or regional growth.
  - ***Moderate*** impacts are detectable, without question, and could have an appreciable effect on the character of the social and economic environment and on local or regional growth.

- **Major** impacts are considered to have a substantial, highly noticeable influence on the social and economic environment and local or regional growth altering the environment over the long run.

In addition, impacts are recognized as indeterminate if the intensity of their effects on the on local or regional growth could not be readily identified (especially when compared with the potential influence of other social and economic factors and/or when data limitations exist).

- **Duration.** The duration of the impact considers whether the impact would occur in the short term or the long term. A short-term impact would be temporary and would be associated with transitional types of activities. A long-term impact would have an ongoing effect on the socioeconomic environment.
- **Type of Impact.** While other impacts were evaluated in terms of whether they would be beneficial or adverse to the socioeconomic environment, it must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment

## Environmental Consequences of Alternative 2: Self-reliant Visitor Experiences and Extensive Floodplain Restoration

### *All River Segments*

Although the entire regional economy may shrink somewhat due to the actions proposed under Alternative 2, the potential shift of some visitor spending from inside the park to gateway communities could create some pressure for new growth in localized areas outside the park. Growth pressures for new visitor-serving commercial facilities would be strongest in communities offering convenient access to the park. To the extent that additional employment is added due to additional commercial business and/or growth in commercial facilities, there may be an indirect inducement for growth in housing stock to accommodate new workers. Residential growth pressures would be strongest in communities that offer an attractive residential environment within reasonable commute distance of jobs, which may be the same communities that receive the visitor-serving growth. New residents may add additional children to local school districts, increasing the load on the educational system but also provide additional average daily attendance reimbursement revenue from the state to the local districts. Additional resident household spending could further increase the need for grocery stores, gas stations, and other commercial facilities.

While the socioeconomic impacts of Alternative 2 are negligible from a regional standpoint, there is potential for long-term growth-inducing impacts on one or more gateway communities because these communities would likely respond to the potential need for additional accommodations and services no longer provided within Yosemite under this alternative.



## **Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration**

### ***All River Segments***

Although the entire regional economy may shrink somewhat due to the actions under Alternative 3, the shift of some visitor spending from inside the park to gateway communities could create some pressure for new growth in localized areas outside the park. Growth pressures for new visitor-serving commercial facilities would be strongest in communities offering convenient access to the park. To the extent that additional employment is added due to additional commercial business and/or growth in commercial facilities, there may be an indirect inducement for growth in housing stock to accommodate new workers. Residential growth pressures would be strongest in communities that offer an attractive residential environment in reasonable commute distance of jobs, which may or may not be the same communities as those receiving the visitor-serving growth. New residents may add additional children to local school districts, increasing both the load on the educational system, but also providing additional average daily attendance reimbursement revenue from the state to the local districts. Additional resident household spending could further increase the need for grocery stores, gas stations, and other commercial facilities.

While the impacts of Alternative 3 are negligible from a regional standpoint, there is potential for long-term growth inducing impacts on one or more gateway communities as these communities would likely respond to the potential need for additional accommodations and services that are no longer provided within Yosemite under this alternative.

## **Environmental Consequences of Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration**

### ***All River Segments***

Although the entire regional economy may shrink somewhat due to the actions in Alternative 4, the shift of some visitor spending from inside the park to gateway communities could create some pressure for new growth in localized areas outside the park. Growth pressures for new visitor-serving commercial facilities would be strongest in communities offering convenient access to the park. To the extent that additional employment is added due to additional commercial business and/or growth in commercial facilities, there may be an indirect inducement for growth in housing stock to accommodate new workers. Residential growth pressures would be strongest in communities that offer an attractive residential environment in reasonable commute distance of jobs, which may or may not be the same communities as those receiving the visitor-serving growth. New residents may add additional children to local school districts, increasing both the load on the educational system, but also providing additional average daily attendance reimbursement revenue from the state to the local districts. Additional resident household spending could further increase the need for grocery stores, gas stations, and other commercial facilities.

While the impacts of Alternative 4 are negligible from a regional standpoint, there is potential for long-term growth-inducing impacts on one or more gateway communities as these communities would likely respond to the potential need for additional accommodations and services that are no longer provided within Yosemite under this alternative.

### **Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration**

#### ***All River Segments***

Although the entire regional economy would likely remain about the same as today due to the actions under Alternative 5, this alternative may result in a minor shift of some visitor spending from inside the park to gateway communities. In the long-term, growth-inducement impacts would therefore be similar to those of current conditions, with regional communities providing employment and services similar to current levels.

### **Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration**

#### ***All River Segments***

Given that accommodations for overnight stays in the park would increase under Alternative 6, and day use access would become slightly more constrained, more visitor service could be provided in the park and there would potentially be less demand pressure on facilities in gateway communities. Alternative 6 would not contribute to growth outside of the park.

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
1. Geology, Geohazards, and Soils					
<u>Segment 1</u> <i>Soils:</i> Meadow recovery from former pack stock grazing would continue to have local, long-term, minor, beneficial impacts. On a segmentwide and local level there would be long-term, minor, adverse impacts to soil resources at the extensive network of social trails in Segment 1.  Existing visitor use and facilities would continue to result in segment-wide, long-term, minor, adverse impacts.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> The removal of minor structures would have a local long-term, minor, beneficial impact on soil resources by resulting in a slight reduction in the stresses on soils from visitor uses, overnight camping, and presence of infrastructure.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> The removal of minor structures would have a local long-term, minor, beneficial impact on soil resources by resulting in a slight reduction in the stresses on soils from visitor uses, overnight camping, and presence of infrastructure.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> The removal of minor structures would have a local long-term, minor, beneficial impact on soil resources by resulting in a slight reduction in the stresses on soils from visitor uses, overnight camping, and presence of infrastructure.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Restoration actions and reductions in overnight accommodations would have a local, long-term, minor, beneficial impact on soil resources.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> The general level of visitor use would slightly increase and visitor impacts, such as soil compaction and informal trail use, would continue. Restoration actions, however, would reduce the stresses on soils. The overnight accommodation actions would thus result in long-term, local, minor, adverse impacts on soil resources.
<u>Segment 2</u> <i>Soils:</i> Restoration projects in Yosemite Valley meadows and on the riverbanks would result in local, long-term, minor to moderate, beneficial impacts.  Continued riverbank erosion and trampling from informal trails and a stock trail would result in local, long-term, minor to moderate, adverse impacts.  The presence of disturbed ground, construction-related fills, and the general coverage and density of developed facilities would continue to result in a segmentwide, long-term, moderate, adverse impact on soil resources.  <i>Geohazards:</i> Implementation of the 2012 Yosemite Valley Geologic Hazard Guidelines and associated visitor use and facilities actions would result in local, long-term, moderate, beneficial impacts with respect to geohazards.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Removal of campsites, informal trails, and other restoration actions would result in local, long-term, moderate beneficial impacts with respect to soil resources. On a segmentwide level, impacts would be long-term, minor and beneficial.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Geohazards:</i> Reduced visitation and removal of lodging from the rockfall hazard areas would reduce exposure to geohazards, which is a segment-wide, long-term, moderate, beneficial impact.  <i>Soils:</i> The removal of buildings, tent cabins and parking and reduced visitation would improve soils conditions and allow for soils to support plant growth resulting in local, long-term, minor, beneficial impacts. New concessioner housing and parking would directly affect soils through compaction and paving, resulting in local, long-term, minor, adverse impacts.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Removal of campsites, informal trails, and other restoration actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources. On a segmentwide level, impacts would be long-term, minor and beneficial.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Geohazards:</i> Reduced visitation and removal of lodging from the rockfall hazard areas would reduce exposure to geohazards, which is a segment-wide, long-term, moderate, beneficial impact.  <i>Soils:</i> Transportation, recreation, and restoration actions would restore floodplains, reduce parking areas, and spread out rafting takeout locations. These actions would improve soil conditions through decompaction and revegetation, and also potentially decrease foot traffic and associated soil stressors. This would have a local, long-term, minor to moderate, beneficial impact on soil resources.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Removal of campsites, informal trails, and other restoration actions would result in local, long-term, minor to moderate, beneficial impacts with respect to soil resources. On a segmentwide level, impacts would be long-term, minor and beneficial.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Geohazards:</i> Reduced visitation and removal of lodging from the rockfall hazard areas would reduce exposure to geohazards, which is a segment-wide, long-term, minor to moderate, beneficial impact.  <i>Soils:</i> Reduced lodging units and parking spaces would decrease impacts on soils, resulting in local, long-term, minor to moderate, beneficial impacts on soil resources.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Removal of campsites, informal trails, and other restoration actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources. On a segmentwide level, impacts would be long-term, minor and beneficial.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Geohazards:</i> Reduced visitation and removal of lodging from the rockfall hazard areas would reduce exposure to geohazards, which is a segment-wide, long-term, minor, beneficial impact.  <i>Soils:</i> Increased overnight accommodations and parking spaces would result in impacts to soils, though they would not occur within sensitive meadow soils and riparian areas. Thus, actions would have long-term, local, negligible. Reductions in concessioner employee housing and visitor-use management actions would reduce the number of structures within the valley and include restoration. Therefore these actions would have a local, long-term,	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Removal of campsites, informal trails, and other restoration actions would result in local, long-term, moderate, beneficial impacts with respect to soil resources. On a segmentwide level, impacts would be long-term, minor and beneficial.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Geohazards:</i> Reduced visitation and removal of lodging from the rockfall hazard areas would reduce exposure to geohazards, which is a segment-wide, long-term, negligible, beneficial impact.  <i>Soils:</i> Increased overnight accommodations and parking spaces would result in impacts to soils, though they would be moved away from sensitive meadow soils and riparian areas. Thus, actions would have long-term, local, minor, adverse impacts on soil resources. Transportation impacts would result in local, long-term, minor adverse effects. Visitor-use management actions would include restorative actions, therefore these actions would have a local, long-term, negligible, beneficial

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
				minor, beneficial impact.	impact.
1. Geology, Geohazards, and Soils (cont.)					
<u>Segment 3 &amp; 4</u>  <i>Soils:</i> Vehicles and foot traffic would continue to affect soils near valley oak trees in El Portal which would be a local, long-term, minor, adverse impact on soils supporting valley oak trees.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Oak protection activities would result in long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> New housing facilities at Abbieville, El Portal Village Center, and Rancheria would disturb soil resources through installation, compaction, and paving, and would also lead to further compaction of soils and/or increased susceptibility to erosion through increased foot traffic. Therefore, these actions would result in a long-term, local, minor, adverse impact on soil resources.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Oak protection activities would result in long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.  <i>Impacts of Actions to Manage Visitor Use and Facilities:</i>  <i>Soils:</i> Facility actions would remove existing housing units at Abbieville and El Portal Trailer Court and restore the floodplain. These actions would result in long-term, minor beneficial impact at the local level. New housing development at El Portal Village Center and Rancheria Flatt would permanently disturb soil resources, resulting in a long-term, minor, adverse, impact.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Oak protection activities would result in long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Facility actions would remove existing housing units at Abbieville and El Portal Trailer Court and restore the floodplain. These actions would result in long-term, minor beneficial impact at the local level. New housing development at El Portal Village Center and Rancheria Flatt would permanently disturb soil resources, resulting in a long-term, minor, adverse, impact.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Oak protection activities would result in long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Facility actions would remove existing housing units at Abbieville restore the floodplain. These actions would result in long-term, minor beneficial impact at the local level. New housing development at El Portal Village Center Rancheria Flatt would permanently disturb soil resources, resulting in a long-term, minor, adverse, impact.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Oak protection activities would result in long-term, local, moderate, beneficial impact on soils. In a segmentwide context, the actions would result in a minor, beneficial impact on soil resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Facility actions would remove existing housing units at Abbieville restore the floodplain. These actions would result in long-term, minor beneficial impact at the local level. New housing development at Abbieville, El Portal Village Center, and Rancheria Flatt would permanently disturb soil resources, resulting in a long-term, minor, adverse, impact.
<u>Segment 5,6,7, &amp; 8</u>  <i>Soils:</i> Continued riverbank erosion and soil compaction at Wawona Store picnic area and Wawona Campground would result in local, long-term, minor, adverse impacts.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Actions include removal of the Wawona Golf Course, which would result in local, long-term, moderate beneficial impacts.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Soil stresses would be decreased due to the elimination of stable rides, the reduction in the number of visitors, and removal of campsites. These actions would have a local, long-term, minor to moderate, beneficial impact on soils in the Wawona area.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Actions include removal of the Wawona Golf Course, which would result in local, long-term, moderate, beneficial impacts.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Soil stresses would be reduced, resulting in local, long-term, minor to moderate, beneficial impacts.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Actions include removal of relocation of the stock use campsite, which would result in local, long-term, minor beneficial impacts.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Soil stresses would be reduced, resulting in local, long-term, minor, beneficial impacts.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Actions include relocation of the stock use campsite, which would result in local, long-term, minor beneficial impacts.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Soil stresses would be reduced, resulting in local, long-term, minor, beneficial impacts.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Soils:</i> Actions include relocation of the stock use campsite, which would result in local, long-term, minor beneficial impacts.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  <i>Soils:</i> Soil stresses would be reduced, resulting in local, long-term, minor, beneficial impacts.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
1. Geology, Geohazards, and Soils (cont.)					
<u>Cumulative</u>  <i>Geohazards:</i> Past and present projects, combined with Alternative 1 expose visitor to risks from earthquakes and rock falls, which is a parkwide, long-term, moderate, adverse impact. Continued stabilization and rehabilitation work, and policy restrictions from development in rock-fall hazard zones in Segment 2, would provide some local, long-term, moderate, beneficial impacts.  <i>Soils</i> – A combination of adverse impacts from and beneficial impacts from restoration activities on soil resources would likely result in an overall balance which is considered a parkwide, long-term, negligible, adverse, cumulative effect.	<u>Cumulative</u>  <i>Geohazards</i> – At a parkwide level, Alternative 2, in combination with past, present, and reasonably foreseeable future projects, would result in a negligible, adverse, cumulative effect with respect to exposure of park visitors and facilities to geohazards.  <i>Soils</i> – Cumulatively, a combination of adverse and beneficial impacts would occur. Beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) would likely outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternative 2 would result in a parkwide, minor to moderate, beneficial, cumulative impact.	<u>Cumulative</u>  <i>Geohazards</i> – At a parkwide level, Alternative 2, in combination with past, present, and reasonably foreseeable future projects, would result in a minor to moderate, beneficial impact with respect to exposure of park visitors and facilities to geohazards.  <i>Soils</i> – Cumulatively, a combination of adverse and beneficial impacts would occur. Beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) would likely outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternative 2 would result in a parkwide, minor to moderate, beneficial, cumulative impact.	<u>Cumulative</u>  <i>Geohazards</i> – At a parkwide level, Alternative 2, in combination with past, present, and reasonably foreseeable future projects, would result in a minor to moderate, beneficial impact with respect to exposure of park visitors and facilities to geohazards.  <i>Soils</i> – Cumulatively, a combination of adverse and beneficial impacts would occur. Beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) would likely outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternative 2 would result in a parkwide, minor, beneficial, cumulative impact.	<u>Cumulative</u>  <i>Geohazards</i> – At a parkwide level, Alternative 2, in combination with past, present, and reasonably foreseeable future projects, would result in a minor, beneficial impact with respect to exposure of park visitors and facilities to geohazards.  <i>Soils</i> – Cumulatively, a combination of adverse and beneficial impacts would occur. Beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) would likely outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternative 2 would result in a parkwide, minor, beneficial, cumulative impact.	<u>Cumulative</u>  <i>Geohazards</i> – At a parkwide level, Alternative 2, in combination with past, present, and reasonably foreseeable future projects, would result in a negligible, beneficial impact with respect to exposure of park visitors and facilities to geohazards.  <i>Soils</i> – Cumulatively, a combination of adverse and beneficial impacts would occur. Beneficial impacts (e.g., meadow/riparian restoration, removal of informal trails, directing of visitors away from sensitive areas) would likely outweigh adverse impacts (which would generally be short term or highly localized). Combined with the generally positive impacts of past, present, and reasonably foreseeable future projects, Alternative 2 would result in a parkwide, negligible, beneficial, cumulative impact.
2. Hydrology, Floodplains and Water Quality					
<u>Segment 1</u>  The continued presence of the Nevada Fall Diversion Dam would slightly alter the natural processes of the Merced River, but would not have an overall affect on the character of the river. Water quality would be expected to remain high, with isolated instances of minor contamination, especially after storm events, but would not be expected to exceed water quality standards. These actions would have a local, long-term, negligible to minor, adverse impact on water quality	<u>Segment 1</u>  Hydrology. Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced promoting dispersed camping. Concentrated campgrounds would be removed and replaced with dispersed camping, reducing the potential for informal trails and vegetation trampling, leading to an increase in the ability of the soil to infiltrate runoff. This action would result in a local, long-term, negligible, beneficial impact on hydrology.  Water Quality. These actions would reduce erosion and would result in a local, long-term, negligible, beneficial, impact on water quality.	<u>Segment 1</u>  Hydrology. Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced promoting dispersed camping. Concentrated campgrounds would be removed and replaced with dispersed camping, reducing the potential for informal trails and vegetation trampling, leading to an increase in the ability of the soil to infiltrate runoff. This action would result in a local, long-term, negligible, beneficial impact on hydrology.  Water Quality. These actions would reduce erosion and would result in a local, long-term, negligible, beneficial, impact on water quality.	<u>Segment 1</u>  Hydrology. Overnight capacities for both Little Yosemite Valley and Merced Lake would be reduced promoting dispersed camping. Concentrated campgrounds would be removed and replaced with dispersed camping reducing the potential for informal trails and vegetation trampling. This action would result in a local, long-term, negligible, beneficial impact on hydrology.  Water Quality. These actions would reduce erosion and would result in a local, long-term, negligible, beneficial, impact on water quality.	<u>Segment 1</u>  Hydrology. The reduction in capacity at Merced Lake High Sierra Camp would slightly reduce the amount of localized vegetation trampling, leading to an increase in the ability of the soil to infiltrate runoff. This action would result in a local, long-term, negligible, beneficial impact on hydrology.  Water Quality. The reduction in capacity at Merced Lake High Sierra Camp would slightly reduce the amount of localized vegetation trampling, leading to a decrease in erosion. This action would result in a local, long-term, negligible, beneficial impact on water quality.	<u>Segment 1</u>  Hydrology. The continuation of current levels of visitor use and concentrated camping may increase informal trails and vegetation trampling, and would result in a local, long-term, negligible, adverse impact on hydrology.  Water Quality. The continuation of current levels of visitor use and concentrated camping may increase informal trails and vegetation trampling, increasing the potential for erosion, resulting in a local, long-term, negligible, adverse impact on water quality.

Segment 1 – Above Nevada Falls  
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Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
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Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
2. Hydrology, Floodplains and Water Quality (cont.)					
<u>Segment 2</u> Hydrology. Bridges would continue to constrict flow, exacerbate scour, and cause streambank erosion leading to continued impediments to hydrology and the free-flowing character of the Merced River. This would cause corridorwide, long-term, moderate, adverse impacts on hydrology. Continued concentrated visitor use on riverbanks would adversely affect floodplains and would constitute a corridorwide, long-term, minor, adverse impact on hydrology. Water quality in Segment 2 would be expected to remain high, with isolated instances of minor contamination especially after storm events, but would not be expected to exceed water quality standards.	<u>Segment 2</u> Hydrology. Removal of Stoneman, Sugarpine, and Ahwahnee bridges, among other development from 100-year floodplain, and restoration and/or redevelopment of these areas would have local, long-term, moderate, beneficial impact on hydrology.  Water Quality. These actions would reduce polluted stormwater runoff, channel scour, and erosion, resulting in local, long-term, minor, beneficial impact on water quality.  Floodplains: These actions would also reduce water surface elevations during floods, thereby resulting in a local, long-term, minor, beneficial impact on floodplains.	<u>Segment 2</u> Hydrology. Removal of Stoneman, Sugarpine, and Ahwahnee bridges, among other development from within 150 feet of the river, and restoration and/or reconfiguration of these areas would have local, long-term, minor to moderate, beneficial impact on hydrology.  Water Quality. These actions would reduce polluted stormwater runoff, channel scour, and erosion, resulting in local, long-term, minor, beneficial impact on water quality.  Floodplains: These actions would also reduce water surface elevations during floods, thereby resulting in a local, long-term, minor, beneficial impact on floodplains.	<u>Segment 2</u> Hydrology. Removal of Sugarpine and Ahwahnee bridges, among other development from within 150 feet of the river, and restoration and/or reconfiguration of these areas would have local, long-term, minor to moderate, beneficial impact on hydrology.  Water Quality. These actions would reduce polluted stormwater runoff, channel scour, and erosion, resulting in local, long-term, minor, beneficial impact on water quality.  Floodplains: These actions would also reduce water surface elevations during floods, thereby resulting in a local, long-term, minor, beneficial impact on floodplains.	<u>Segment 2</u> Hydrology. Removal of Sugarpine Bridge, among other development from within 100 feet of the river, and restoration and/or reconfiguration of these areas would have local, long-term, minor, beneficial impact on hydrology.  Water Quality. These actions would reduce polluted stormwater runoff, channel scour, and erosion, resulting in local, long-term, negligible to minor, beneficial impact on water quality.  Floodplains: These actions would also reduce water surface elevations during floods, thereby resulting in a local, long-term, negligible, beneficial impact on floodplains.	<u>Segment 2</u> Hydrology. Placement of large wood and constructed logjams along the bases of Sugarpine, Ahwahnee, and Stoneman Bridges, removal of development from within 100 feet of the river, and development and redevelopment of areas beyond, would have a local, long-term, negligible to minor, beneficial impacts on hydrology.  Water Quality. These actions would reduce polluted stormwater runoff, channel scour, and erosion, resulting in local, long-term, negligible, beneficial impact on water quality.  Floodplains: These actions would also reduce water surface elevations during floods, thereby resulting in a local, long-term, negligible, beneficial impact on floodplains.
<u>Segments 3 and 4</u> Hydrology. Infrastructure along Highway 140; riprap along the river and abandoned infrastructure and imported fill remain, affecting natural river processes. Local, long-term, minor, adverse impact on hydrology.  Water Quality. Off-street and roadside parking areas and fuel station would continue to be located underneath valley oaks having the potential to introduce hydrocarbons and sediment to the river, resulting in a long-term, negligible, adverse local, impact on water quality.	<u>Segments 3 and 4</u> Hydrology. Oak protection, removal of fill, and decompaction would promote infiltration in the area, resulting in a local, long-term, negligible, beneficial impact on hydrology.  Construction of new concessioner employee housing at Abbieville and Rancheria Flatt would involve vegetation removal, soils compaction, and increased areas of impervious surfaces, contributing to local, long-term, minor, adverse impacts on hydrology.  Water Quality. Oak protection actions would have a long-term, negligible, beneficial impact on water quality.  New housing development would have a local long-term, negligible, adverse impact on water quality.	<u>Segments 3 and 4</u> Hydrology. Oak protection, removal of fill, and decompaction and parking restrictions would promote infiltration in the area, resulting in a local, long-term, negligible, beneficial impact on hydrology.  Construction of new concessioner employee housing at Abbieville and Rancheria Flatt would involve vegetation removal, soils compaction, and increased areas of impervious surfaces, contributing to local, long-term, minor, adverse impacts on hydrology.  Water Quality. These actions would also have a local long-term, negligible, adverse impact on water quality.	<u>Segments 3 and 4</u> Hydrology. Oak protection, removal of fill, and decompaction and parking restrictions would promote infiltration in the area, resulting in a local, long-term, negligible, beneficial impact on hydrology.  Construction of new concessioner employee housing at Abbieville and Rancheria Flatt would involve vegetation removal, soils compaction, and increased areas of impervious surfaces, contributing to local, long-term, minor, adverse impacts on hydrology.  Water Quality. These actions would also have a local long-term, negligible, adverse impact on water quality.	<u>Segments 3 and 4</u> Hydrology. Oak protection, removal of fill, and decompaction and parking restrictions would promote infiltration in the area, resulting in a local, long-term, negligible, beneficial impact on hydrology.  Construction of new concessioner employee housing at Abbieville and Rancheria Flatt would involve vegetation removal, soils compaction, and increased areas of impervious surfaces, contributing to local, long-term, minor, adverse impacts on hydrology.  Water Quality. These actions would also have a local long-term, negligible, adverse impact on water quality.	<u>Segments 3 and 4</u> Hydrology. Oak protection, removal of fill, and decompaction and parking restrictions would promote infiltration in the area, resulting in a local, long-term, negligible, beneficial impact on hydrology.  Construction of new concessioner employee housing at Abbieville and Rancheria Flatt would involve vegetation removal, soils compaction, and increased areas of impervious surfaces, contributing to local, long-term, minor, adverse impacts on hydrology.  Water Quality. These actions would also have a local long-term, negligible, adverse impact on water quality.

Segment 1 – Above Nevada Falls  
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Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
<b>2. Hydrology, Floodplains and Water Quality (cont.)</b>					
<u>Segments 5, 6, 7, and 8</u> Facilities such as the Wawona Store Picnic Area, the impoundment and surface water withdrawals from the South Fork would present a local, long-term, minor, adverse impact on hydrology	<u>Segments 5, 6, 7, and 8</u> Hydrology. The removal and restoration of the Wawona Golf Course and campsites would result in a decrease of trampling and an increase in native vegetation and soil infiltration. Impervious surfaces would be reduced, thereby restoring the hydrologic regime resulting in a local, long-term minor, beneficial impact on hydrology.  Water Quality. These actions would decrease trampling, established vegetation would be less likely to erode, which would reduce fine sediment loads resulting in a local, long-term, negligible, beneficial impact on water quality.  Floodplain. These actions would also increase connectivity between the South Fork Merced River and its floodplain. This would result in a local, long-term, minor, beneficial impact on floodplains.	<u>Segments 5, 6, 7, and 8</u> Hydrology. The removal and restoration of the Wawona Golf Course and campsites sites would result in a decrease of trampling and an increase in native vegetation and soil infiltration. Impervious surfaces would be reduced, thereby restoring the hydrologic regime resulting in a local, long-term minor, beneficial impact on hydrology.  Water Quality. These actions would decrease trampling, established vegetation would be less likely to erode, which would reduce fine sediment loads resulting in a local, long-term, negligible, beneficial impact on water quality.  Floodplain. These actions would also increase connectivity between the South Fork Merced River and its floodplain. This would result in a local, long-term, minor, beneficial impact on floodplains.	<u>Segments 5, 6, 7, and 8</u> Hydrology. The removal and restoration of campsites sites would result in a decrease of trampling and an increase in soil infiltration. Impervious surfaces would be reduced, thereby restoring the hydrologic regime resulting in a local, long-term minor, beneficial impact on hydrology.  Water Quality. These actions would decrease trampling, established vegetation would be less likely to erode, which would reduce fine sediment loads resulting in a local, long-term, negligible, beneficial impact on water quality.  Floodplains. These actions would also increase connectivity between the South Fork Merced River and its floodplain. This would result in a local, long-term, minor, beneficial impact on floodplains.	<u>Segments 5, 6, 7, and 8</u> Hydrology. The removal and restoration of campsites sites would result in a decrease of trampling and an increase in soil infiltration. Impervious surfaces would be reduced, thereby restoring the hydrologic regime resulting in a local, long-term minor, beneficial impact on hydrology.  Water Quality. These actions would decrease trampling, established vegetation would be less likely to erode, which would reduce fine sediment loads resulting in a local, long-term, negligible, beneficial impact on water quality.  Floodplains. These actions would also increase connectivity between the South Fork Merced River and its floodplain. This would result in a local, long-term, minor, beneficial impact on floodplains.	<u>Segments 5, 6, 7, and 8</u> Hydrology. The removal and restoration of campsites sites would result in a decrease of trampling and an increase in soil infiltration. Impervious surfaces would be reduced, thereby restoring the hydrologic regime resulting in a local, long-term minor, beneficial impact on hydrology.  Water Quality. These actions would decrease trampling, established vegetation would be less likely to erode, which would reduce fine sediment loads resulting in a local, long-term, negligible, beneficial impact on water quality.  Floodplains. These actions would also increase connectivity between the South Fork Merced River and its floodplain. This would result in a local, long-term, minor, beneficial impact on floodplains.
<u>Cumulative</u> Overall development and recreational uses within the Merced River watershed have resulted in local, long-term, moderate, adverse impacts on natural hydrology, water quality, and floodplains throughout the Yosemite region.	<u>Cumulative</u> The removal of riprap, removal of three bridges and unnecessary infrastructure, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, moderate to major, beneficial cumulative impacts on hydrology, and floodplains, and a local, long-term, minor to moderate, beneficial cumulative impact on water quality.	<u>Cumulative</u> The removal of riprap, removal of three bridges and unnecessary infrastructure, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, moderate to major, beneficial cumulative impacts on hydrology and floodplains, and a local, long-term, minor to moderate, beneficial cumulative impact on water quality	<u>Cumulative</u> The removal of riprap, removal of three bridges and unnecessary infrastructure, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, moderate, beneficial cumulative impacts on hydrology and floodplains, and a local, long-term, minor to moderate, beneficial cumulative impact on water quality	<u>Cumulative</u> Under Alternative 5, removal of riprap, removal of one bridge and unnecessary infrastructure, installation of logjams and other hydrology-enhancing actions, restoration of meadow hydrology, and improvements to wastewater collection would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, moderate, beneficial cumulative impacts on hydrology and floodplains, and local, long-term, minor to moderate, beneficial cumulative impacts on water quality.	<u>Cumulative</u> Removal of riprap and unnecessary infrastructure, restoration of meadow hydrology, installation of logjams and other hydrologic would result in increased alluvial processes, reconnection of the Merced River to its floodplain, and enhanced water quality. This would contribute to local, long-term, minor, beneficial cumulative impacts on hydrology, floodplains, and water quality.

Segment 1 – Above Nevada Falls  
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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
3. Vegetation and Wetlands					
<u>Segment 1</u> Impacts on vegetation and wetland resources in Segment 1 under the No-action Alternative would be local, long-term, and minor adverse.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in a local, long-term, minor, beneficial impact on plant communities and wetlands in Segment 1.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in a local, long-term, negligible, beneficial impact on plant communities and wetlands in Segment 1.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in continued local, long-term, minor, adverse impacts on vegetation and wetlands within Segment 1.
<u>Segment 2</u> Impacts on vegetation and wetland resources in Segment 2 through implementation of the No-action Alternative are considered to be local, long-term, and moderate adverse.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of approximately 271 acres of vegetation and 47.92 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of approximately 32.27 acres of vegetation, primarily located near previously developed areas, resulting in a long-term, local, minor to moderate, adverse impacts to the affected plant communities. Actions to manage visitor use and facilities would result in the loss of 2.72 acres of jurisdictional wetlands.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 3 would result in the restoration of approximately 230 acres of vegetation and 39.85 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 31.66 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts these communities. Actions to manage visitor use and facilities would result in the loss of 2.72 acres of jurisdictional wetlands.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 4 would result in the restoration of 194 acres of vegetation and 44.52 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 31.70 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the permanent loss of 1.17 acres of jurisdictional wetlands.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 5 would result in the restoration of 182 acres of vegetation and 40.37 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 34.64 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the permanent loss of 1.17 acres of jurisdictional wetlands.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 6 would result in the restoration of 156 acres of vegetation and 37.32 acres of wetland, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 34.64 acres of vegetation primarily located near previously developed areas, resulting in long-term, local, minor to moderate, adverse impacts to these communities. Actions to manage visitor use and facilities would result in the loss of 1.17 acres of jurisdictional wetlands.
<u>Segment 3 &amp; 4</u> The impacts on valley oaks in Segment 4 (the El Portal area) are considered local, long-term, and moderate adverse.  Impacts on wetlands and aquatic resources in Segments 3 and 4 under the No-action Alternative are considered to be local, long-term, and minor adverse.	<u>Segment 3 &amp; 4</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 13 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands.	<u>Segment 3 &amp; 4</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 13 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands.	<u>Segment 3 &amp; 4</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 12 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands.	<u>Segment 3 &amp; 4</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 12 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands.	<u>Segment 3 &amp; 4</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 would result in the restoration of 12 acres of vegetation and 0.05 acres of wetland, resulting in long-term, local, moderate, beneficial impacts on vegetation and wetlands.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River



TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
3. Vegetation and Wetlands (cont.)					
<u>Segment 3 &amp; 4</u> (cont.)	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to vegetation and wetlands.
<u>Segment 5, &amp; 8</u>  Impacts on vegetation and wetland resources in Segments 5 and 8, under the No-action Alternative, are considered to be local, long-term, and minor adverse.	<u>Segment 5, 6, 7 &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 2 would result in the restoration of 52 acres of vegetation, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands.	<u>Segment 5,6, 7 &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 3 would result in the restoration of 48 acres of vegetation, resulting in long-term, segmentwide, major, beneficial impacts on vegetation and wetlands.	<u>Segment 5, 6, 7 &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 3 would result in the restoration of seven acres of vegetation, resulting in long-term, segmentwide, minor, beneficial impacts on vegetation and wetlands.	<u>Segment 5, 6, 7 &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 5 would result in the restoration of three acres of vegetation, resulting in long-term, segmentwide, minor, beneficial impacts on vegetation and wetlands.	<u>Segment 5, 6, 7 &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 6 would result in the restoration of three acres of vegetation, resulting in long-term, segmentwide, minor, beneficial impacts on vegetation and wetlands.
<u>Segment 6 &amp; 7</u>  Impacts on wetland and riparian resources in Segment 7, under the No-action Alternative, would be local, long-term, and moderate adverse. Impacts to habitat due to visitor use and existing infrastructure would result in local, long-term, minor, and adverse.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to vegetation and wetlands.
<u>Cumulative</u>  Past, present, and future effects, in conjunction with the local, long-term, minor, adverse impacts of Alternative 1, would result in long-term, minor, adverse, impacts on wetlands.	<u>Cumulative</u>  While Alternative 2 would not contribute toward adverse cumulative effects, the cumulative trend of other actions would result in long-term, minor adverse effects on regional vegetation patterns.	<u>Cumulative</u>  While Alternative 3 would not contribute toward adverse cumulative effects, the cumulative trend of other actions would result in long-term, minor, adverse effects on regional vegetation patterns	<u>Cumulative</u>  While Alternative 4 would not contribute toward adverse cumulative effects, the cumulative trend of other actions would result in long-term, minor, adverse effects on regional vegetation patterns.	<u>Cumulative</u>  While Alternative 5 would not contribute toward adverse cumulative effects, the cumulative trend of other actions would result in long-term, minor, adverse effects on regional vegetation patterns.	<u>Cumulative</u>  While Alternative 6 would not contribute toward adverse cumulative effects, the cumulative trend of other actions would result in long-term, minor, adverse effects on regional vegetation patterns
4. Wildlife					
<u>Segment 1</u>  Overall, wildlife habitat in the Yosemite Wilderness would remain undisturbed under Alternative 1, with site-specific exceptions associated with trail corridors. Impacts would be local, minor, and long term adverse.  Continuation of current wilderness policies, including protection of natural	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The reduction in overnight facilities and overnight visitors represents a reduction in human presence, human-related pressures on wildlife, and reduced future impacts on wildlife habitat in localized areas of Segment 1. Collectively, actions	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Alternative 3 would reduce the amount of infrastructure and visitor use in Segment 1, resulting in a local, long-term, minor, beneficial impact on wildlife.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Alternative 4 would reduce the amount of infrastructure in Segment 1 of the Merced River corridor through the removal of the Merced Lake High Sierra Camp and associated infrastructure. Collectively, actions to manage visitor	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Alternative 5 would accommodate the same kinds and amounts of use that exist today in Segment 1, with a slight reduction in overnight visitors. Collectively, actions to manage visitor use and facilities would result in local, long-	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Collectively, actions to maintain similar kinds and levels of use as current levels would result in impacts similar to that described for Alternative 1 (No Action): continued local, long-term, minor, adverse impacts on wildlife in Segment 1.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
4. Wildlife (cont.)					
<u>Segment 1</u> (cont.)  processes, visitor education with an emphasis on Leave-No-Trace practices, use of the wilderness trailhead quota system, and restrictions on amounts and locations of overnight use, would protect intact natural habitats, including the distribution, numbers, population composition, and interaction of native species. In general, adverse impacts on wildlife resources in Segment 1 under Alternative 1 would be local, minor, and long term.	  to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts on wildlife.		  use and facilities under Alternative 4 would result in local, long-term, minor, beneficial impacts on wildlife in Segment 1.	  term, minor beneficial impacts on wildlife. The removal and conversion of existing improvements would result in local, short-term, adverse impacts on wildlife. Adhering to proposed mitigation measures in Appendix I would reduce these short-term impacts to minor and adverse.	
<u>Segment 2</u>  Continuation of current practices would result in long-term, minor, adverse impacts on aquatic and terrestrial wildlife associated with riverine habitat (including meadows and riparian habitat adjacent to the river).  Streambank destabilization in the vicinity of wood removal would continue, causing a local, long-term, minor, adverse impact on aquatic habitat for fisheries and wildlife. By allowing the former Upper River and Lower River Campgrounds to passively revert to natural conditions, Alternative 1 would result in long-term, local, minor, beneficial impact on wildlife. Continued conifer encroachment would result in local, long term, minor, and adverse impacts.  Impacts of Actions to Manage User Capacity, Land Use, and Facilities Existing improvements and visitor use would continue to affect the size, structure, productivity, and continuity (within habitat and between habitats) of wildlife habitats. Overall, adverse impacts on wildlife resources would be local, minor, and long term.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of approximately 268 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of approximately 24.48 acres of wildlife habitat primarily located near previously developed areas, resulting in a long-term, local, minor, adverse impact to wildlife.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of 228 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 28.79 acres of wildlife habitats primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts wildlife.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 4 would result in the restoration of 194 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 31.70 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 5 would result in the restoration of 174 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 34.64 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segment 2 under Alternative 6 would result in the restoration of 166 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in the loss of 34.64 acres of wildlife habitats and additional use over existing conditions, resulting in long-term, segmentwide, minor, adverse impacts to wildlife.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
4. Wildlife (cont.)					
<u>Segment 3 &amp; 4</u>  Current conditions would continue to result in long-term, local, minor, adverse impacts on channel free-flow, water quality, riparian habitat development, and aquatic and terrestrial wildlife that inhabit these habitats. Current practices would result in long-term, local, minor, adverse impacts on valley oak habitat, thereby affecting wildlife species that depend on this habitat type.  Visitor pass-through use would continue to be the majority of use. Impacts from current actions to manage visitor use and facilities would result in continued long-term, local, negligible, adverse impacts on wildlife habitat and wildlife species in these segments.	<u>Segment 3 &amp; 4</u>	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 11 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 12 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 under Alternative 4 would result in the restoration of 11 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 under Alternative 5 would result in the restoration of nine acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 3 and 4 under Alternative 6 would result in the restoration of nine acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.
<u>Segment 5,6,7, &amp; 8</u>  Continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use, would protect intact natural habitats, including the distribution, numbers, population composition, and interaction of native species. Overall, adverse impacts on	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 2 would result in the restoration of 46 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 3 would result in the restoration of 46 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 4 would result in the restoration of five acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 5 would result in the restoration of two acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 6 would result in the restoration of two acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
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Segment 7 - Wawona  
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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
4. Wildlife (cont.)					
<u>Segment 5,6,7, &amp; 8 (cont.)</u>  wildlife resources are local, long-term, and negligible. There is less pressure by anglers on the South Fork Merced River fisheries than on the main stem because of the difficult access and terrain. There would therefore be short-term, local, negligible, adverse impacts on fisheries under Alternative 1.  Visitor use in Segments 5 and 6 would remain very low, There are no overnight lodging accommodations in Segment 8. For the coniferous and deciduous forests adjacent to Wawona (Segment 7), habitat fragmentation caused by existing development and use would continue to affect wildlife, and would result in long-term, minor, adverse impacts on wildlife. Planned habitat restoration would mitigate for some of these adverse impacts, resulting in long-term, negligible, adverse impacts on wildlife.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.
<u>Cumulative</u>  Although general effects associated with Alternative 1 would be negligible, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be regional, minor, adverse, and long term.	<u>Cumulative</u>  Because the actions proposed for Alternative 2 would further increase the habitat value of the Merced River corridor, it would contribute towards a long-term, cumulative, beneficial effect on fish and wildlife and may, in some cases, reverse local population declines for some species. Songbirds, reptiles, and amphibians in particular would benefit cumulatively from Alternative 2 because the quantity of preferred habitat (meadows and riparian) would see a net increase.	<u>Cumulative</u>  Because the actions proposed for Alternative 3 would further increase the habitat value of the Merced River corridor, this alternative would contribute toward a long-term, cumulative, beneficial effect on fish and wildlife and may, in some cases, offset or reverse local population declines for some species. Songbirds, reptiles, and amphibians in particular would benefit cumulatively from Alternative 3 because there would be a net increase in quantity of preferred habitat (meadows and riparian) compared to existing amounts	<u>Cumulative</u>  While Alternative 4 would cumulatively contribute beneficial impacts, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be long term, minor, and beneficial.	<u>Cumulative</u>  Although general effects associated with Alternative 5 would be beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative, would be long term and negligible.	<u>Cumulative</u>  While the cumulative contribution associated with Alternative 6 would be minor and adverse, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative, would also be long term, minor, and adverse.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

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Segment 7 - Wawona  
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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
5. Special Status Species					
<u>Segment 1</u> Currently, special status species or their habitats are affected by trampling, human disturbance, grazing and stock use. Impacts from habitat loss and competition for resources also affect these species through nonnative species encroachment. These adverse impacts would continue under Alternative 1 and be local, minor, and long-term.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> In the long-term, restoration actions would have a local, long-term, minor, beneficial impact on special status wildlife and plant species in the upper Merced watershed.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> In the long-term, restoration actions would have a local, long-term, minor, beneficial impact on special status wildlife and plant species in the upper Merced watershed. Beneficial impacts would be somewhat less than those described for Alternative 2.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Management actions would have a local, long-term, minor, beneficial impact on special status plant and wildlife species that use coniferous forests in the upper Merced River watershed.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> In the long-term, programmatic management actions would have a local, long-term, minor, beneficial impact on special status wildlife species that use coniferous forests in the upper Merced watershed. Beneficial effects would be less pronounced than Alternatives 2 and 3.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Alternative 6 would maintain the current level of use within Segment 1. Collectively, actions to maintain similar kinds and levels of use as current levels would result in continued local, long-term, minor, adverse impacts on special status species within Segment 1.
<u>Segment 2</u> In general, when combined with existing habitat management programs, the ongoing adverse effects on habitat combined with continued visitor use and the foreseeable increase in visitors under Alternative 1 would result in local, long-term, minor, adverse effects on rare, threatened, and endangered species within Segment 2.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i> A total of 268 acres of riparian, floodplain meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 2, resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these management actions would have long-term, moderate, beneficial impacts on species of special status plants and wildlife that use the Merced River and adjacent meadows and riparian habitats in Yosemite Valley. <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Vegetation removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Overall, these actions would result in local, long-term, minor, beneficial impacts on special status plant and animals in Segment 2.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i> A total of 228 acres of riparian, floodplain, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 3, resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these management actions would have long-term, moderate, beneficial impacts on species of special status plants and wildlife that use the Merced River and adjacent meadows and riparian habitats in Yosemite Valley. <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Vegetation removed under Alternative 2 would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Overall, these actions would result in local, long-term, minor, beneficial impacts on special status plant and animals in Segment 2, although somewhat less so than Alternative 2.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i> A total of 194 acres of floodplain, riparian, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 4, resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these management actions would have long-term, moderate, beneficial impacts on species of special status plants and wildlife that use the Merced River and adjacent meadows and riparian habitats in Yosemite Valley. <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Restoring habitat following the removal of facilities and parking lots would increase the extent and contiguity of habitat for special status species; limiting day use activities and roadside parking would reduce impacts to sensitive habitats such as riparian woodland and wet meadows. These actions would result in local, long-term, minor, beneficial impacts on special status plant and animals in Segment 2.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i> A total of 174 acres of floodplain, riparian, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 5, resulting in direct benefits to fish and wildlife that use these habitat types. Thus, over time these habitat restoration management actions would have long-term, moderate, beneficial impacts on species of special status plants and wildlife that use the Merced River and adjacent meadows and riparian habitats in Yosemite Valley. <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Maintaining and constructing new overnight camping and lodging facilities would maintain dense levels of the built environment within the Valley, resulting in long-term, minor, adverse impacts on wildlife in Segment 2 from human presence and human-related pressures (noise, human food, vegetation trampling, etc.).	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i> A total of 166 acres of floodplain, riparian, meadow, woodland, and forest habitat would be restored in Segment 2 under Alternative 6, resulting in direct benefits to fish and wildlife that use these habitat types. Over time, these management actions would have long-term, moderate, beneficial impacts on special status plants and wildlife species that use the Merced River and adjacent meadows and riparian habitats in Yosemite Valley <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Constructing new overnight camping and lodging facilities would maintain and intensify dense levels of the built environment within the Valley, resulting in segmentwide, long-term, minor, adverse impacts on wildlife from human presence and human-related pressures (such as noise, human food, and vegetation trampling).

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Segment 7 - Wawona  
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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
6. Lightscares					
<u>Segment 1, 5 &amp; 8</u> There are no actions proposed under Alternative 1 that would explicitly affect lighting, and impacts would be local, negligible to minor, and adverse.	<u>Segment 1, 5 &amp; 8</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Reduced visitation and modifications to existing campgrounds would reduce nighttime lighting, and removal of the Merced Lake High Sierra Camp would eliminate sources of nighttime lighting in the vicinity of the camp. The associated impact on Segment 1 would be local, long-term, minor, and beneficial.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Reduced visitation and modifications to existing campgrounds would reduce nighttime lighting, and removal of the Merced Lake High Sierra Camp would eliminate sources of nighttime lighting in the vicinity of the camp. The associated impact on Segment 1 would be local, long-term, minor, and beneficial.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Reduced visitation could improve the lightscape environment within Segment 1. With a slight reduction in designated camping only and retention of several campground facilities, sources of artificial lighting would remain concentrated within these areas. However, the removal and conversion of the Merced Lake High Sierra Camp would eliminate nighttime lighting in the vicinity of the camp. The resulting impact on the park’s lightscape environment would be local, long-term, minor, and beneficial.	<u>Segment 1, 5 &amp; 8</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Visitation, wilderness access quotas, and designated camping would not be expected to change, while modifications to overnight accommodations would be nominal within Segment 1. As such, potential sources of artificial night lighting would continue. Reduction in units at the Merced Lake High Sierra Camp would reduce slightly the amount of artificial lighting in the vicinity of the camp. The resulting long-term impact would be local, negligible, and beneficial.	<u>Segment 1</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Visitation and wilderness access quotas would remain the same, as well as operation of the Merced Lake High Sierra Camp at capacity, and modifications to overnight accommodations would be nominal.  As such, potential sources of artificial night lighting would continue. The resulting impact on the environment would be local, long-term, negligible to minor, and adverse.
<u>Segment 3 &amp; 6</u> Increased visitation could result in a relatively minor increase in transient night lighting from greater numbers of cars traveling through Segment 3, or from exterior safety lighting in Wawona, adjacent to Segment 6. As a result, impacts are considered to have a local, long-term, negligible, adverse effect.	<u>Segment 3 &amp; 6</u> No impact.	<u>Segment 3, 5, 6 &amp; 8</u> No impact.	<u>Segment 3, 5, 6 &amp; 8</u> No impact.	<u>Segment 3 &amp; 6</u> No impact.	<u>Segment 3, 5, 6 &amp; 8</u> No impact.
<u>Segment 2,4 &amp; 7</u> Lighting would continue to be most intense around those existing developed areas, but no new substantial sources of night lighting are anticipated. However, with increased visitation, potential sources of additional lighting could include those associated with increased nighttime traffic and greater numbers of overnight campground visitors during nonpeak seasons. Long-term implications would be local, negligible to minor, and adverse.	<u>Segment 2,4 &amp; 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  A substantial number of lodging and residential units and campsites would be removed or relocated within Segment 2. These actions would increasing sources of nighttime lighting in some areas, but decrease lightscape impacts overall. The resulting impact on lightscares within Segments 2 would be local, long-term, beneficial, and moderate.  The park would construct new housing within the Old El Portal, Abbieville and Rancheria areas of Segment 4, contributing to area lightscape impacts.	<u>Segment 2, 4 &amp; 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  A substantial number of lodging and residential units would be removed or relocated, and number of campsites slightly increased within Segment 2 These actions would increasing sources of nighttime lighting in some areas, but decrease lightscape impacts overall. The resulting impact on lightscares within Segments 2 would be local, long-term, beneficial, and moderate.  The park would construct new housing within the Rancheria area of Segment 4, contributing to area lightscape impacts.	<u>Segment 2,4 &amp; 7</u>  A considerable number of lodging and residential units would be removed or relocated, and number of campsites substantially increased within Segment 2 These actions would increasing sources of nighttime lighting in some areas, but decrease lightscape impacts overall. The resulting impact on lightscares within Segments 2 would be local, long-term, beneficial, and minor.  The park would construct new housing within the Rancheria area of Segment 4, contributing to area lightscape impacts. However, with mitigation, the long-term	<u>Segment 2,4 &amp; 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  A considerable number of residential units would be removed, while lodging and campsite capacities would increase within Segment 2 These actions would increasing sources of nighttime lighting in several areas, and decrease lightscape impacts in others. The resulting impact on lightscares within Segments 2 would be local, long-term, negligible, and adverse.  The park would construct new housing within the Rancheria area of Segment 4, contributing to area lightscape impacts.	<u>Segment 2,4 &amp; 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  A considerable number of residential units would be removed, while lodging and campsite capacities would increase substantially within Segment 2 These actions would increasing sources of nighttime lighting throughout the developed areas of the valley, The resulting impact on lightscares within Segments 2 would be local, long-term, minor, and adverse.  The park would construct new employee housing within the Abbieville and Rancheria areas of Segment 4,

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
6. Lightscapes (cont.)					
<u>Segment 2,4 &amp; 7</u> (cont.)	However, with mitigation, the long-term impact associated with the project would be local, moderate, and adverse.  Within Segment 7, the Wawona stables would be removed and 32 campsites eliminated which would reduce lightscape impacts, and the long-term effect would be local, minor, and beneficial.	However, with mitigation, the long-term impact associated with the project would be local, minor, and adverse.  Within Segment 7, the Wawona stables would be removed and 27 campsites eliminated, which would reduce lightscape impacts. The long-term effect would be local, minor, and beneficial.	impact associated with the project would be local, minor to moderate, and adverse.  Within Segment 7, the Wawona stables would be removed and 27 campsites eliminated, which would reduce lightscape impacts. The long-term effect would be local, negligible, and beneficial.	However, with mitigation, the long-term impact associated with the project would be local, minor to moderate, and adverse.  Within Segment 7, the park would remove 13 campsites from the Wawona Campground, reducing overnight visitation and lightscape impacts. The effect would be long-term, local, negligible, and beneficial.	contributing to area lightscape impacts. However, with mitigation, the long-term impact associated with the project would be local, moderate, and adverse.  Within Segment 7, the Wawona stables would be removed and 13 campsites eliminated from the Wawona Campground, reducing overnight visitation and lightscape impacts. The effect would be long-term, local, negligible, and beneficial.
<u>Cumulative</u>  A long-term, park-wide, negligible to minor, adverse	<u>Cumulative</u>  Past actions, specifically the construction of housing for employees previously residing in hazard prone areas within Yosemite Valley, have slightly increased the amount of artificial lighting within the park. Present actions may result in regional increases in night-sky impacts, and the introduction of a few new individual sources of lighting within the park, but a continued overall reduction in the impacts associated with in-park lighting. As a result, cumulative effects would be local, long-term, minor to moderate, and beneficial.	<u>Cumulative</u>  There are no anticipated development projects outside of those described that would contribute to light pollution within the park. Combined impacts of past and present actions, including those originating from outside the park, the cumulative effect of actions would be local, long-term, minor to moderate, and beneficial.	<u>Cumulative</u>  There are no anticipated development projects outside of those described that would contribute to light pollution within the park. Combined impacts of past, present, and reasonably foreseeable actions, including those originating from outside the park, the cumulative long-term effect of actions would be local minor, and beneficial.	<u>Cumulative</u>  There are no anticipated development projects outside of those described that would contribute to light pollution within the park. Combined impacts of past, present, and reasonably foreseeable actions, including those originating from outside the park, the cumulative effect of would be local, long-term, negligible, and adverse.	<u>Cumulative</u>  There are no anticipated development projects outside of those described that would contribute to light pollution within the park. Combined impacts of past, present, and reasonably foreseeable actions, including those originating from outside the park, the cumulative effect of would be local, long-term, minor, and adverse.
7. Soundscapes					
<u>Segment 1</u>  Under this alternative a gradual increase in annual visitation over the next five years would occur, and a rise in human-related sounds would contribute to a long-term, negligible to minor, adverse impact on the soundscape environment.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions related to visitor use and facilities would require construction efforts which would yield construction noise. Where these operations are near sensitive receivers, and short-term, moderate, adverse impacts on soundscapes would occur. Changes to the trailhead quota system and removal of campsites would reduce long-term noise exposure in these areas, having an overall long-term, negligible to minor, beneficial impact on soundscapes.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions related to visitor use and facilities would require construction efforts which would yield construction noise. Where these operations are near sensitive receivers, and short-term, moderate, adverse impacts on soundscapes would occur. Changes to the trailhead quota system and removal of campsites would reduce long-term noise exposure in these areas, having an overall long-term, negligible to minor, beneficial impact on soundscapes.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  This alternative would require construction efforts that would yield construction noise that is short-term. Where these operations are near sensitive receivers, they would be expected to have short-term, moderate, adverse impacts. Changes to the trailhead quota system and removal of the Merced Lake High Sierra Camp would reduce noise exposure having an overall long-term, negligible to minor, beneficial impact on the soundscape environment.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Removal of certain facilities and infrastructure would yield short-term construction noise. Where these operations are near sensitive receivers, they would be expected to have short-term, moderate, adverse impacts. Reductions in the number of Merced Lake High Sierra Camp overnight visitors would reduce noise exposure having an overall long-term, negligible, beneficial impact.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Removal and replacement of certain facilities and infrastructure would yield short-term construction noise. Where these operations are near sensitive receivers, they would be expected to have short-term, moderate, adverse impacts on soundscapes in the vicinity.

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
7. Soundscapes (cont.)					
<u>Segment 2</u>  Crowding and congestion would contribute to an increase of unnatural sounds. The continuation of present visitation trends would, therefore, contribute to a long-term, negligible to minor, adverse impact on the soundscape.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i> Impacts on the natural soundscape environment within areas where removal of buildings, rerouting and revegetating the Valley Loop Trail, and restorative actions would be short-term, minor to moderate, and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Construction noise and associated traffic would have a short-term, moderate, adverse impact. The reduction in lodging, campsites, and overall visitation would combine to reduce noise within these areas of Yosemite Valley, resulting in a long-term, minor to moderate, beneficial impact on the soundscape environment.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Impacts on the natural soundscape environment within areas where removal of buildings, rerouting and revegetating the Valley Loop Trail, and restorative actions would be short-term, minor to moderate, and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  New camping and parking facilities would result in construction noise that have a short-term, moderate, adverse impact. In the long-term, minor impacts to soundscapes while the removal of lodging, campsites and parking would result in long-term, minor to moderate, beneficial impacts in other areas.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Noise from demolition/construction work related to restoration activities would have a short-term, minor, adverse impacts.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  New camping and parking facilities would result in construction noise that have a short-term, moderate, adverse impact. In the long-term, minor impacts to soundscapes while the overall decrease in lodging and residential units, along with total visitation, would result in long-term, minor, beneficial impacts within Segment 2.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Projects involve rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail, as well as other restoration activities and removal of a bridge, would result in a short-term, minor to moderate, adverse impact.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Removal of residential units, construction of new campgrounds and lodging, and parking improvements would have a short-term, moderate, adverse impact. New camping, lodging, and parking facilities would result in long-term, minor, adverse impacts to soundscapes. Overall, reduced visitation and employee housing within the valley would contribute to long-term, negligible to minor, beneficial impacts on the soundscape environment of Segment 2.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Projects proposed involve removing buildings, restoration activities, as well as rerouting, revegetating, and constructing a boardwalk along a portion of the Valley Loop Trail. The resulting impacts would be short-term, minor to moderate, and adverse to the soundscapes.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Parking improvements, construction of a roundabout and underpass, new lodging and campsite development at several locations, which would result in short-term, moderate, adverse noise impacts. New camping, lodging, and parking facilities, along with overall increased visitation, would result in long-term, negligible, adverse impacts on the Soundscape environment of Segment 2.
<u>Segment 3 &amp; 4</u>  Higher noise levels caused by vehicular use near roadways would persist, and the frequency and duration of transitory sound sources would increase with park visitation. The continued trends in visitor-related noise would result in a long-term, negligible to minor, adverse impact.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Proposed actions to protect and restore areas around valley oaks would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Noise from demolition/ construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. New employee housing would contribute to increased noise associated with housing occupation in Abbieville and Rancheria, and impacts would be long-term, minor, and adverse.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Proposed actions to protect and restore areas around valley oaks would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Noise from demolition/ construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria. The expected impact on soundscapes would be long-term, negligible to minor, and adverse.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Proposed actions to protect and restore areas around valley oaks would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Noise from demolition/ construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria. The expected impact on soundscapes would be long-term, minor, and adverse.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Proposed actions to protect and restore areas around valley oaks would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Noise from demolition/ construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Rancheria. The expected impact on soundscapes would be long-term, minor, and adverse.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Proposed actions to protect and restore areas around valley oaks would result in short-term, moderate, adverse impacts on soundscapes in the project vicinity.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Noise from demolition/ construction work would be expected to have a short-term, moderate, adverse impact on noise-sensitive uses in the vicinity. The construction of new employee housing would contribute to increased noise associated with housing occupation in Abbieville and Rancheria. The expected impact on soundscapes would be long-term, minor, and adverse.

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Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
7. Soundscapes (cont.)					
<u>Segment 5,6,7, &amp; 8</u> The increase in visitor-related noise exposure in Segments 5, 6, and 8 is speculative due to continued limited accessibility to these areas. Therefore, it is not known whether visitation to these areas would increase relative to existing conditions.  Noise levels caused by visitor crowding and congestion would continue in Segment 7, contributing to a long-term, negligible to minor, adverse impact.	<u>Segment 5,6,7, &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Restoration activities would increase construction-related noise and project vehicles would add to the existing traffic noise production from nearby roadways, resulting in short-term, moderate, adverse impacts. In the long-term the removal of the golf course would result in minor, beneficial impacts as maintenance- and visitor-related sources of noise in this area would be eliminated.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Closure of the concessioner stable, campsite removal and relocation, and restroom improvements at Wawona would result in short-term, moderate, adverse impacts from construction noise. The removal of campsites from culturally sensitive areas would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact.	<u>Segment 5,6,7, &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Restoration activities would increase construction-related noise and project vehicles would add to the existing traffic noise production from nearby roadways, resulting in short-term, moderate, adverse impacts. In the long-term the removal of the golf course would result in minor, beneficial impacts as maintenance- and visitor-related sources of noise in this area would be eliminated.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Closure of the concessioner stable, campsite removal and relocation, and restroom improvements at Wawona would result in short-term, moderate, adverse impacts on soundscapes in the vicinity from construction noise. The removal of campsites from culturally sensitive areas would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact.	<u>Segment 5,6,7, &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Restoration activities involve heavy equipment which would have a short-term, moderate, adverse impact in the vicinity of the action.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Closure of the concessioner stable, campsite removal and relocation, and restroom improvements at Wawona would result in short-term, moderate, adverse impacts on soundscapes in the vicinity from construction noise. The removal of campsites from culturally sensitive areas would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact.	<u>Segment 5,6,7, &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Restoration activities involve heavy equipment which would have a short-term, moderate, adverse impact in the vicinity of the action.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Campsite removal and relocation, and restroom improvements at Wawona, would require construction efforts that would result in short-term, moderate, adverse impacts. The removal of campsites from culturally sensitive areas would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on soundscapes.	<u>Segment 5,6,7, &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Restoration activities involve heavy equipment which would have a short-term, moderate, adverse impact in the vicinity of the action.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The removal of campsites, changes to visitor and administrative facilities, and various visitor access and transportation improvements would result in short-term, moderate, adverse impacts. The removal of campsites from culturally sensitive areas would reduce noise exposure in these areas, having an overall long-term, negligible, beneficial impact on soundscapes
<u>Cumulative</u> Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts, primarily in non-wilderness areas. Increasing numbers of visitors could result in long-term, negligible to minor impacts.	<u>Cumulative</u> Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts. The construction of new facilities would contribute to long-term, minor, adverse noise impacts. However, these long-term increases would be offset by long-term, minor to moderate, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.	<u>Cumulative</u> Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts. The construction of new facilities would contribute to long-term, minor, adverse noise impacts. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.	<u>Cumulative</u> Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts. The construction of new facilities would contribute to long-term, minor, adverse noise impacts. However, these long-term increases would be offset by long-term, minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.	<u>Cumulative</u> Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts. The construction of new facilities would contribute to long-term, minor, adverse noise impacts. However, these long-term increases would be offset by long-term, negligible to minor, beneficial impacts from removal of housing and facilities in other areas of the Merced River corridor.	<u>Cumulative</u> Rehabilitation and restoration activities have and would continue to result in short-term, moderate, adverse impacts. Increased visitation, in combination with new facilities construction and operation would contribute to long-term, minor, adverse noise impacts to soundscapes in the vicinity of these facilities.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
8. Air Quality					
<u>Segment 1, 5, 6, &amp; 8</u>  There are no transportation facilities in these segments and none are proposed under this alternative, incidental future increases in traffic would affect these segments by pollutant drift. The overall effect on regional air pollution conditions would be long term, minor, and adverse.	<u>Segment 1, 5, 6, &amp; 8</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation and associated campfires would be less than under Alternative 1. Alternative 1. With fewer on-road vehicles in the vicinity, the overall effect on local air pollution conditions would be long term, minor, and beneficial.	<u>Segment 1, 5, 6, &amp; 8</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation and associated campfires would be less than under Alternative 1. With fewer on-road vehicles in the vicinity under Alternative 3, the overall effect on local air pollution conditions would be long term, minor, and beneficial.	<u>Segment 1, 5, 6, &amp; 8</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation and associated campfires would be less than under Alternative 1. With fewer on-road vehicles in the vicinity under Alternative 4, the overall effect on air pollution conditions would be long term, minor, and beneficial.	<u>Segment 1, 5, 6, &amp; 8</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation and associated campfires would be only slightly less than under Alternative 1. With fewer on-road vehicles in the vicinity under Alternative 5, the overall effect on air pollution conditions would be long term, minor, and beneficial.	<u>Segment 1, 5, 6, &amp; 8</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation would not change from that of Alternative 1. With more vehicles on park roads and in the vicinity of wilderness, the overall effect on local, air pollution conditions would be long term, minor, and beneficial.
<u>Segment 2</u>  There would likely continue to be segmentwide, minor, long-term, adverse air quality impacts associated with traffic congestion and delays that would continue to occur at busy intersections. Future increase in visitors would also increase usage of campfires and vehicle emissions, resulting in greater impacts to air quality.	<u>Segment 2</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation and total daily use levels would be 26% and 33% less, respectively, than under Alternative 1. With fewer on-road vehicles and potential for campfire smoke, the overall effect on local air pollution conditions would be long term, minor, and beneficial.	<u>Segment 2</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation and total daily use levels would be 23% and 37% less, respectively, than under Alternative 1. With fewer on-road vehicles, the effect on local air pollution conditions would be long term, minor, and beneficial. Slightly more campsites would occur under this alternative, resulting in local, long-term, moderate, adverse impact on sensitive receptors.	<u>Segment 2</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation would be 7% greater and total daily use levels would be 19% less than under Alternative 1. With fewer on-road vehicles under this alternative, the overall effect on local air pollution conditions along roadways would be long term, minor, and beneficial. The expected increase in the usage of campfires would have a potentially local, long-term, moderate, adverse impact on sensitive receivers.	<u>Segment 2</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation would be 16% greater and total daily use levels would be 5% less than under Alternative 1. With fewer on-road vehicles, the overall effect on local air pollution conditions would be long term, minor, and beneficial. The expected increase in the usage of campfires would have a potentially local, long-term, moderate, adverse impact on sensitive receivers.	<u>Segment 2</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Maximum overnight visitation and total daily use levels would be 33% and 6% greater, respectively, than under Alternative 1. With more on-road vehicles, the overall effect on local air pollution conditions along roadways would be long term, negligible to minor, and adverse. With the expected increase in the usage of campfires, a potentially local, long-term, moderate, adverse impact on sensitive receptors would occur.
<u>Segment 3 &amp; 4</u>  There are no NPS overnight accommodations, and thus few campfires or other visitor-related evening sources of smoke. With increases to visitation, road dust would be expected to increase associated with traffic congestion, which would result in long-term, local, minor, adverse impacts.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  There are no NPS overnight accommodations and thus few campfires or other visitor-related evening sources of smoke. Total daily use levels would be less than under Alternative 1. With fewer on-road vehicles, despite increased housing, the overall effect on local air pollution conditions would be long term, minor, and beneficial.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  There are no NPS overnight accommodations and thus few campfires or other visitor-related evening sources of smoke. Total daily use levels would be less than under Alternative 1. With fewer on-road vehicles, despite increased housing, the overall effect on local air pollution conditions would be long term, minor, and beneficial.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  There are no NPS overnight accommodations and thus few campfires or other visitor-related evening sources of smoke. Total daily use levels would be less than under Alternative 1. With fewer on-road vehicles, despite increased housing, the overall effect on local air pollution conditions would be long term, minor, and beneficial.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  There are no NPS overnight accommodations and thus few campfires or other visitor-related evening sources of smoke. Total daily use levels would be less than under Alternative 1. With fewer on-road vehicles, despite increased housing, the overall effect on local air pollution conditions would be long term, minor, and beneficial.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  There are no NPS overnight accommodations and thus few campfires or other visitor-related evening sources of smoke. Total daily use levels would be greater than under Alternative 1. With more on-road vehicles, the overall effect on local air pollution conditions would be regional and local, long term, negligible, and adverse.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
8. Air Quality (cont.)					
<u>Segment 7</u> Segmentwide, long-term, minor, adverse air quality impacts associated with traffic congestion and delays that would continue to occur, and possibly increase should visitation levels increase in the future. It is expected that the usage of campfires would increase and have a potentially long-term, local, major, adverse impact on sensitive receptors.	<u>Segment 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Thirty-two campsites, or 33% of all campsites within Wawona would be removed from the floodplain. This would result in a long-term, local, minor, beneficial impact on air quality due to reduced overnight visitation and campfire emissions.	<u>Segment 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Thirty-two campsites, or 28% of all campsites within Wawona would be removed from the floodplain. This would result in a long-term, local, minor, beneficial impact on air quality due to reduced overnight visitation and campfire emissions.	<u>Segment 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Thirty-two campsites, or 28% of all campsites within Wawona would be removed from the floodplain. This would result in a long-term, local, minor, beneficial impact on air quality due to reduced overnight visitation and campfire emissions.	<u>Segment 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Thirty-two campsites, or 13% of all campsites within Wawona would be removed from the floodplain. This would result in a long-term, local, minor, beneficial impact on air quality due to reduced overnight visitation and campfire emissions.	<u>Segment 7</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Thirty-two campsites, or 33% of all campsites within Wawona would be removed from the floodplain. This would result in a long-term, local, minor, beneficial impact on air quality due to reduced overnight visitation and campfire emissions.
<u>Cumulative</u> If visitation levels, VMT within the corridor, or usage of campfires were to increase, a local, long-term, minor to major, adverse impact on air pollution would occur, contributing to cumulative impacts.	<u>Cumulative</u> With reduced visitor capacity and campsites, this alternative would result in a long-term, cumulatively beneficial impact on air quality from reduced VMT and campfire usage. The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor, beneficial impacts on air quality.	<u>Cumulative</u> With reduced visitor capacity, this alternative would result in a long-term, cumulatively beneficial impact on air quality from reduced VMT. The number of campsites would increase which would result in a local, long-term, moderate adverse impact. The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.	<u>Cumulative</u> With reduced overall visitor capacity, this alternative would result in a regional and local, long-term, minor cumulatively beneficial impact on air quality from reduced VMT. However, increased campsites could result in a local, moderate, adverse impact from increased campfire usage. The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.	<u>Cumulative</u> With reduced overall visitor capacity, would result in a regional and local, long-term, minor, beneficial impact for ROG emissions. However, with the increased bus operations under this alternative, NOx emissions would be a regional and local, long-term, negligible adverse impact. Increased campsites could result in a local moderate, adverse impact from increased campfire usage. The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.	<u>Cumulative</u> With increased overall visitor capacity, this alternative would result in a regional and local, long-term, negligible to minor cumulatively adverse impact on air quality from increased VMT and increased campfire usage. The continued management of traffic and encouragement of alternative forms of transportation would have regional and local, long-term, negligible to minor beneficial impacts on air quality.
9. Scenic Resources					
<u>Segment 1</u> Under this alternative, existing scenic resource impacts affecting natural resource areas and scenic views would occur. With increased park visitation under this alternative, ongoing visitor use impacts on natural resources would continue. Local, long-term, minor, adverse impacts would occur.	<u>Segment 1</u> Removal of structures, restoration of camping areas, expansion disbursed camping areas, and reduction in visitors would result in local, long-term, minor, beneficial impacts on the scenic resources.	<u>Segment 1</u> Removal of structures, restoration of camping areas, expansion disbursed camping areas, and reduction in visitors would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources.	<u>Segment 1</u> Removal of structures, restoration of camping areas, expansion disbursed camping areas, and reduction in visitors would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources.	<u>Segment 1</u> Retention of the Merced Lake High Sierra Camp, albeit reduced in capacity, and maintaining existing use levels within wilderness areas, along with various restoration measures, would result in conditions slightly improved from those of Alternative 1 (No Action). The resulting impact would be local, long-term, negligible, and beneficial.	<u>Segment 1</u> The Merced Lake High Sierra Camp and designated camping areas, among other human-made structures would be retained resulting in less restoration activities being implemented, and the existing wilderness permit numbers would be maintained. As such, local, long-term, negligible, adverse impacts would occur.

Segment 1 – Above Nevada Falls  
Segment 2 - Yosemite Valley  
Segment 3 – Merced Gorge

Segment 4 – El Portal  
Segment 5 – South Fork of Merced Above Wawona  
Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
9. Scenic Resources (cont.)					
<u>Segment 2</u> Local, long-term, minor to moderate, adverse impacts would occur to scenic resources because ongoing visitor use impacts on natural resources would continue and vegetation management actions would not be implemented. Also, there would be the continued presence of visual intrusions, and increased visitation. Restoration projects and invasive species removal would improve scenic quality and the visibility of a number of scenic viewpoints.	<u>Segment 2</u> Implementation of proposed actions would result in: removal of areas of resource damage that detract from the scenic quality of the river corridor; vegetation restoration; removal of a substantial number of housing, lodging, and campground facilities, and reduced visitors overall. These actions would have local, long-term, moderate to major, beneficial impacts on the scenic resources within Segment 2.	<u>Segment 2</u> Implementation of proposed actions would remove areas of resource damage that detract from the scenic quality of the river corridor, and involve restoration of vegetation. Lodging and housing structures would be removed, and new campsites would be added. The overall number of visitors would be reduced. Local, long-term, moderate, beneficial impacts on the scenic resources would occur.	<u>Segment 2</u> Implementation of proposed actions would result in: removal of areas of resource damage that detract from the scenic quality of the river corridor; vegetation restoration; reduced visitors overall; less development; and removal of structures. Meadow and riverbank restoration approaches are proposed, and various road and trail removal/relocation projects would occur. Local, long-term, minor to moderate, beneficial impacts on the scenic resources would occur.	<u>Segment 2</u> Implementation of proposed actions would result in: vegetation restoration; maintenance of visitor capacity; new and expanded campgrounds; a greater number of campsites to be retained; and scenic vista points in some campground areas would not be improved. Local, long-term, minor, beneficial impacts would occur.	<u>Segment 2</u> Implementation of the proposed actions would result in: vegetation restoration, an increase in visitor capacity; new campgrounds; more campground and overnight accommodations to be retained; extensive meadow and riverbank restoration. As such, local, long-term, negligible, beneficial impacts would occur.
<u>Segment 3 &amp; 4</u> Ongoing visitor use impacts on natural and scenic resources would continue and vegetation management actions would not be implemented. The continued presence of human-made structures would remain and increased visitation could result in impacts on the scenic quality, and implementation of the <i>Scenic Vista Management Plan</i> would not occur. Local, long-term, minor, adverse impacts on the scenic resources would occur.	<u>Segment 3 &amp; 4</u> Establishment of the oak tree recruitment zone would have a long-term, minor, beneficial impact on Segment 4. New housing developments in Abbierville and Rancheria would increase in man-made structures, although primarily developed areas. Thus, local, long-term, minor, adverse e impacts on the scenic resources would occur.	<u>Segment 3 &amp; 4</u> Establishment of the oak tree recruitment zone would have a long-term, minor, beneficial impact on Segment 4. New housing developments in Rancheria would increase in man-made structures, although primarily developed areas. Thus, local, long-term, minor, adverse e impacts on the scenic resources would occur.	<u>Segment 3 &amp; 4</u> Establishment of the oak tree recruitment zone would have a long-term, minor, beneficial impact on Segment 4. New housing developments in Rancheria would increase in man-made structures, although primarily developed areas. Thus, local, long-term, minor, adverse e impacts on the scenic resources would occur.	<u>Segment 3 &amp; 4</u> Establishment of the oak tree recruitment zone would have a long-term, minor, beneficial impact on Segment 4. New housing developments in Rancheria would increase in man-made structures, although primarily developed areas. Thus, local, long-term, minor, adverse e impacts on the scenic resources would occur.	<u>Segment 3 &amp; 4</u> Establishment of the oak tree recruitment zone would have a long-term, minor, beneficial impact on Segment 4. New housing developments in Abbierville and Rancheria would increase in man-made structures, although primarily developed areas. Thus, local, long-term, minor, adverse e impacts on the scenic resources would occur.
<u>Segment 5,6,7, &amp; 8</u> Under this alternative, existing structures and facilities would remain in viewsheds, affected natural resource areas in scenic views would remain, and vegetative management actions to improve scenic view quality would not occur. Increased visitation could result in impacts on the scenic quality of the segments. Local, long-term, minor, adverse impacts on the scenic resources would occur.	<u>Segment 5,6,7 &amp; 8</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1.The Wawona Golf Course and campsites at the Wawona Campground would be removed. These actions would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segment 7.	<u>Segment 5,6,7&amp; 8</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1.The Wawona Golf Course and campsites at the Wawona Campground would be removed. These actions would result in local, long-term, minor to moderate, beneficial impacts on the scenic resources of Segment 7.	<u>Segment 5,6,7 &amp; 8</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1.The Wawona Golf Course would be retained. Campsites at the Wawona Campground would be removed. These actions would result in local, long-term, minor, beneficial impacts on the scenic resources of Segment 7.	<u>Segment 5,6,7 &amp; 8</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1.The Wawona Golf Course would be retained. Campsites at the Wawona Campground would be removed. These actions would result in local, long-term, negligible, beneficial impacts on the scenic resources of Segment 7.	<u>Segment 5,6,7 &amp; 8</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1.The Wawona Golf Course would be retained. Campsites at the Wawona Campground would be removed. These actions would result in local, long-term, negligible, beneficial impacts on the scenic resources of Segment 7.

Segment 1 – Above Nevada Falls  
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Segment 7 - Wawona  
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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
9. Scenic Resources (cont.)					
<u>Cumulative</u>  This alternative would contribute to worsening localized, adverse conditions in areas with concentrated visitor use and through the continued presence of facilities and infrastructure that are visible within scenic views, and presence of vegetation that is blocking scenic views. Cumulatively, the scenic resources impacts would be local, long term, minor to moderate, and adverse.	<u>Cumulative</u>  Impacts of cumulative projects would remain adverse, while this alternative would result in primarily beneficial impacts. Cumulatively, the impact on scenic resources would be local, long term, moderate, and beneficial.	<u>Cumulative</u>  Impacts of cumulative projects would remain adverse, while this alternative would result in primarily beneficial impacts. Cumulatively, the impact on scenic resources would be local, long term, moderate, and beneficial.	<u>Cumulative</u>  Impacts of cumulative projects would remain adverse, while this alternative would result in primarily beneficial impacts. Cumulatively, the impact on scenic resources would be local, long term, minor to moderate, and beneficial.	<u>Cumulative</u>  Impacts of cumulative projects would remain adverse, while this alternative would result in primarily beneficial impacts. Cumulatively, the impact on scenic resources would be local, long term, minor to moderate, and beneficial.	<u>Cumulative</u>  Impacts of cumulative projects would remain adverse, while this alternative would result in primarily beneficial impacts. Cumulatively, the impact on scenic resources would be local, long term, minor, and beneficial
10. Visitor Experience/Recreation					
<u>Segment 1</u>  Under this alternative, natural areas will be restored and all campgrounds will be retained to allow for a positive visitor experience. There will be wilderness zone capacities and limited wilderness permits, which could help in visitor perception of crowding. This would result in a segment-side, minor, long-term beneficial impact.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage user capacities, land use, and facilities within Segment 1 would a have local, long-term, moderate, adverse impacts on visitor experience and recreation within Segment 1.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage user capacities, land use, and facilities within Segment 1would a have local, long-term, moderate, adverse impacts on visitor experience and recreation within Segment 1.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage user capacities, land use, and facilities within Segment 1would a have local, long-term, moderate, adverse impacts on visitor experience and recreation within Segment 1.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage user capacities, land use, and facilities within Segment 1would a have local, long-term, minor, adverse impacts on visitor experience and recreation within Segment 1.	<u>Segment 1</u>  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage user capacities, land use, and facilities within Segment 1would a have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segment 1.
<u>Segment 2</u>  Recreation activities and services would continue to operate as they do today and continue to exceed their intended visitor use capacity. Lodging, parking, and public transit would not be expanded under this alternative, which would not meet demand for these services. As such, segment-wide, major, long-term adverse impacts would occur.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result local, long-term, minor to moderate, beneficial impacts on visitor experience and recreation within Segment 2. Actions to manage user capacities, land use, and facilities would also have minor beneficial impacts on visitor experience and recreation within Segment 2.
<u>Segment 3 &amp; 4</u>  Under Alternative 1, human-made features and activities would continue to affect natural resources and water quality, but would not have a significant effect on the visitor experience due to the small number of visitors to Segment 4. Due to	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would result in local, long-term, negligible, beneficial impacts on visitor experience and recreation within Segment 4.

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
10. Visitor Experience/Recreation (cont.)					
<u>Segment 3 &amp; 4 (cont.)</u> the projected growth, activities and recreation areas may become slightly more crowded as visitors choose to recreate in this area. These activities would continue to provide scenery, uncrowded conditions, and a variety of water-based recreation opportunities. As such, segment-wide, negligible, long-term, beneficial impacts would occur.	<i>Impacts of Actions to Manage Use and Facilities:</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.	<i>Impacts of Actions to Manage Use and Facilities:</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.	<i>Impacts of Actions to Manage Use and Facilities:</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.	<i>Impacts of Actions to Manage Use and Facilities:</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4	<i>Impacts of Actions to Manage Use and Facilities:</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible, adverse impacts on visitor experience and recreation within Segments 3 & 4.
<u>Segment 5,6,7 &amp; 8</u> Existing facilities would continue to operate under this alternative as they do today. As such, crowding in areas like Wawona would occur, as well as a shortage of parking and lodging. Segment-wide, moderate, long-term, adverse impacts would occur.	<u>Segment 5,6,7 &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.	<u>Segment 5,6,7&amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.	<u>Segment 5,6,7 &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.	<u>Segment 5,6,7 &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.	<u>Segment 5,6,7 &amp; 8</u> <i>Impacts of Actions to Protect and Enhance River Values</i> Actions to manage user capacities, land use, and facilities would have local, long-term, negligible to minor, beneficial impacts on visitor experience and recreation within Segments 5-8.
<u>Cumulative Impacts</u> Alternative 1 would contribute to the cumulative effect of allowing localized impacts on the river environment where visitor concentration is high, and contribute to the shortage in overnight lodging and parking. The cumulative impact6 would be regional, long-term, moderate, and adverse.	<u>Cumulative Impacts</u> Visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans The cumulative impact would be parkwide, long term, minor to moderate, and beneficial.	<u>Cumulative Impacts</u> Visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans The cumulative impact would be parkwide, long term, minor to moderate, and beneficial.	<u>Cumulative Impacts</u> Visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans The cumulative impact would be parkwide, long term, minor to moderate, and beneficial.	<u>Cumulative Impacts</u> Visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans The cumulative impact would be parkwide, long term, minor to moderate, and beneficial.	<u>Cumulative Impacts</u> Visitor services improvements and upgrades would enhance visitor experience and reduce the existing stress on visitor facilities. Visitors would also benefit from past and present habitat and riverbank restoration and resource management projects and plans The cumulative impact would be parkwide, long term, minor to moderate, and beneficial.
11. Wilderness Character					
<u>Segment 1</u> Current activities and actions that exhibit human control and manipulation of the landscape to repair visitor impacts would continue. As such, local, minor, long-term, and adverse impacts to untrammled quality of wilderness character would occur.	<u>Segment 1</u> <i>Impacts of Actions to Manage Use and Facilities:</i> The park would eliminate most of the facilities, infrastructure, and activities that diminish wilderness character; reduce the number of overnight visitors to the Yosemite Wilderness; eliminate overnight stock trips; and designate the	<u>Segment 1</u> <i>Impacts of Actions to Manage Use and Facilities:</i> The park would eliminate most of the facilities, infrastructure, and activities that affect wilderness character, reduce by 50% the number of wilderness permits, reduce overnight stock trips, and designate the Merced Lake High	<u>Segment 1</u> <i>Impacts of Actions to Manage Use and Facilities:</i> The park would eliminate most of the facilities, infrastructure, and activities that affect wilderness character, reduce by 50% the number of wilderness permits in the Little Yosemite Valley zone, eliminate overnight stock trips,	<u>Segment 1</u> <i>Impacts of Actions to Manage Use and Facilities:</i> This alternative would include actions that together would have a local, long-term, negligible to minor, beneficial impact on the untrammled, natural, and undeveloped character of the wilderness and opportunities for	<u>Segment 1</u> <i>Impacts of Actions to Manage Use and Facilities:</i> The wilderness character would remain much the same as it is today. The number of wilderness permits issued would remain the same; the number of visitors to Yosemite Valley would remain close to existing numbers; and pack

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
11. Wilderness Character (cont.)					
<u>Segment 1</u> (cont.)  Current management activities would continue and serve to improve the natural conditions. The impact of these activities on the natural character would be local, minor, long-term and beneficial.  The greatest impacts on the wilderness character would be from the infrastructure and visitor use associated with the Merced Lake High Sierra Camp and from improvements to and concentrated visitor use of the three campgrounds in this segment— Little Yosemite Valley, Moraine Dome, and Merced Lake. In addition, under this alternative, the agency requirement for wilderness permits detracts from the character of unconfined recreation. A local, moderate, long-term, adverse impact on wilderness character would occur.	Merced Lake High Sierra Camp area as wilderness. Together, these actions would have a segmentwide, long-term, major, beneficial impact on wilderness character in Segment 1.	Sierra Camp area as wilderness while providing a temporary pack camp. Together, these actions would have a local, long-term, moderate, beneficial impact on wilderness character.	and designate the Merced Lake High Sierra Camp area as wilderness. Together, these actions would have a segmentwide, long-term, moderate, beneficial impact on wilderness character.	wilderness solitude and primitive recreation. This alternative would maintain approximately the current number of visitors, retain all three backpackers campgrounds at their current size and configuration, and reduce the capacity of the Merced Lake High Sierra Camp. Current wilderness permits and trail quotas for this zone would remain.	stock would continue to access the wilderness. Therefore, this alternative would improve wilderness character slightly. Local, long-term, negligible, beneficial impacts on wilderness character would occur.
<u>Segments 2-4 &amp; 6-8</u>  No impact.	<u>Segments 2-4 &amp; 6-8</u>  No impact.	<u>Segments 2-4 &amp; 6-8</u>  No impact.	<u>Segments 2-4 &amp; 6-8</u>  No impact.	<u>Segments 2-4 &amp; 6-8</u>  No impact.	<u>Segments 2-4 &amp; 6-8</u>  No impact.
<u>Segment 5</u>  There are no man-made alterations to the biophysical environment, and the ecosystem would continue to function with limited human interference due to the near absence of facilities in this segment. No impact would occur.  No development would occur under this alternative; thus, no impact would occur.	<u>Segment 5</u>  <i>Impacts of Actions to Manage Use and Facilities:</i>  No development would occur under this alternative; thus, the impact would remain the same as that of Alternative 1 (No Action).	<u>Segment 5</u>  <i>Impacts of Actions to Manage Use and Facilities:</i>  No development would occur under this alternative; thus, the impact would remain the same as that of Alternative 1 (No Action).	<u>Segment 5</u>  <i>Impacts of Actions to Manage Use and Facilities:</i>  No development would occur under this alternative; thus, the impact would remain the same as that of Alternative 1 (No Action).	<u>Segment 5</u>  <i>Impacts of Actions to Manage Use and Facilities:</i>  No development would occur under this alternative; thus, the impact would remain the same as that of Alternative 1 (No Action).	<u>Segment 5</u>  <i>Impacts of Actions to Manage Use and Facilities:</i>  No development would occur under this alternative; thus, the impact would remain the same as that of Alternative 1 (No Action).

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
11. Wilderness Character (cont.)					
<u>Cumulative Impacts</u> Cumulative impacts would result in improved protection and enhancement of wilderness resources; continued limits on overnight use; and retention of manmade structures and facilities. Impacts would be local, moderate, long term and adverse.	<u>Cumulative Impacts</u> Cumulative impacts would improve wilderness management and limit access to protect wilderness character. The cumulative impact would be segmentwide (in Segments 1 and 5), long term, major, and beneficial.	<u>Cumulative Impacts</u> Cumulative impacts would improve wilderness management and reduce the number of wilderness visitors. The cumulative impact of the wilderness management measures would be segmentwide (in Segments 1 and 5), long term, moderate, and beneficial.	<u>Cumulative Impacts</u> Cumulative impacts would improve wilderness management and reduce the number of wilderness visitors. The cumulative impact of the wilderness management measures would be segmentwide (in Segments 1 and 5), long term, moderate, and beneficial.	<u>Cumulative Impacts</u> Cumulative impacts would improve wilderness stewardship and limit access to protect wilderness character. The cumulative impact of the wilderness management measures would be segmentwide (in Segments 1 and 5), long term, minor, and beneficial.	<u>Cumulative Impacts</u> Cumulative impacts would improve wilderness stewardship and limit access to protect wilderness character. The cumulative impact of the wilderness management measures would be segmentwide (in Segments 1 and 5), long term, negligible to minor, and beneficial.
12. Park Operations and Facilities					
<u>Segment 1, 5 &amp; 8</u> Merced Lake Ranger Station Meadow would continue to experience high levels of bare ground from pack stock grazing and trampling, and informal trails would continue to traverse park meadows. The continuing impact on park operations would continue to be long-term, negligible, and adverse.  The number of designated campsites within the Merced River corridor’s wilderness would remain as under present conditions. The park would continue to experience a long-term, negligible, adverse operational impact from these activities.	<u>Segment 1, 5 &amp; 8</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Visitation within Segment 1 would be reduced. The resulting decline would reduce the park’s operational burden associated with visitation-related wilderness restoration. The long-term impact would be minor and beneficial.  There would be a 100% reduction in the Merced River corridor’s wilderness lodging units. These actions would have long-term, minor, beneficial impacts on concessioner operations.  Removal of the Merced Lake High Sierra Camp and the associated visitor services would require a temporary commitment of park staff time, resources, and equipment. The short-term impact on park operations would be minor and adverse. However, the operational burden would be reduced with their conversion and removal. The long-term impact on park operations would be minor and beneficial.	<u>Segment 1, 5 &amp; 8</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Visitation within Segment 1 would be reduced. The resulting decline would reduce the park’s operational burden associated with visitation-related wilderness restoration. The long-term impact would be minor and beneficial.  There would be a 100% reduction in the Merced River corridor’s wilderness lodging units. These actions would have a long-term, negligible to minor, beneficial impact on concessioner operations.  Removal of the Merced Lake High Sierra Camp, and the associated visitor services, would require a temporary commitment of park staff time, resources, and equipment. The short-term impact on park operations would be minor and adverse. The long-term impact on park operations would be negligible to minor and beneficial.	<u>Segment 1, 5 &amp; 8</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Visitation within Segment 1 would be reduced. The resulting decline would reduce the park’s operational burden associated with visitation-related wilderness restoration. The long-term impact would be minor and beneficial.  There would be a 100% reduction in the Merced River corridor’s wilderness lodging units. These actions would have long-term, minor, beneficial impacts on concessioner operations.  Removal of the Merced Lake High Sierra Camp, and the associated visitor services, would require a temporary commitment of park staff time, resources, and equipment. The short-term impact on park operations would be minor and adverse. The long-term impact on park operations would be negligible to minor and beneficial.	<u>Segment 1, 5 &amp; 8</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Visitation within Segment 1 would not be expected to change appreciably. The park’s operational burden associated with visitation-related wilderness restoration would remain similar to that of Alternative 1. The long-term impact would be negligible to minor and adverse.  NPS and primary park concessioner staff would continue to experience a long-term, negligible, adverse impact associated with staffing, supplying, and maintaining the Merced Lake High Sierra Camp operations.  The removal of infrastructure and restoration of these camps would require a temporary commitment of park staff time, resources, and equipment. The short-term impact on park operations would be negligible to minor and adverse. The long-term impact on park operations would be negligible and adverse.	<u>Segment 1, 5 &amp; 8</u> <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i> Visitation within Segment 1 would not be expected to change appreciably. The park’s operational burden associated with visitation-related wilderness restoration would remain similar to that of Alternative 1. The long-term impact would be negligible to minor and adverse.  NPS and primary park concessioner staff would continue to experience a long-term, negligible, adverse impact associated with staffing, supplying, and maintaining the Merced Lake High Sierra Camp operations.  The removal of infrastructure and restoration of these camps would require a temporary commitment of park staff time, resources, and equipment. The short-term impact on park operations would be negligible to minor and adverse. The long-term impact on park operations would be negligible and adverse.

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
12. Park Operations and Facilities (cont.)					
<p><u>Segment 2</u></p> <p>Protecting river values under these conditions would necessitate ongoing maintenance and restoration activities, the impact on park operations would continue to be long-term, minor, and adverse.</p> <p>The impact on staffing and other resources required to restore areas affected by high visitor use, manage traffic, and maintain visitor-serving facilities would continue to be long-term, minor, and adverse.</p> <p>Overnight lodging facilities would remain in operation and continue to receive guests at present levels. The management and maintenance requirements of these facilities would continue to have a long-term, negligible to minor, adverse impact on park operations.</p> <p>The number of campsites within the valley would remain as under current conditions. Through the continued operation of these facilities, and maintenance and restoration required of high visitation in their vicinity, park staff would continue to incur a long-term, negligible to minor, adverse operational impact.</p> <p>Concessioner operations within the valley would stay in their present locations and conditions. Under these conditions, operational impact would continue to be negligible to minor, and adverse.</p>	<p><u>Segment 2</u></p> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>Restoration projects would require a considerable amount of park staff time and resources.</p> <p>These actions would benefit parkwide operations because they would lessen the need for future restoration. However, they would also increase the need for ongoing monitoring and maintenance of the restoration areas. The overall impact on park operations would be long-term, negligible, and adverse.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Changes in visitation, overnight accommodations, employee housing, and transportation infrastructure and management would have a parkwide, long-term, minor to moderate, beneficial impacts on park operations and facilities.</p>	<p><u>Segment 2</u></p> <p><i>Impacts of Actions to Protect and Enhance River Value:</i></p> <p>Restoration projects would require a considerable amount of park staff time and resources.</p> <p>These actions would benefit parkwide operations because they would lessen the need for future restoration. However, they would also increase the need for ongoing monitoring and maintenance of the restoration areas. The overall impact on park operations would be long-term, negligible, and adverse.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Changes in visitation, overnight accommodations, employee housing, and transportation infrastructure and management would have a parkwide, long-term, minor to moderate, beneficial impacts on park operations and facilities.</p>	<p><u>Segment 2</u></p> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>Restoration projects would require a considerable amount of park staff time and resources.</p> <p>These actions would benefit parkwide operations because they would lessen the need for future restoration. However, they would also increase the need for ongoing monitoring and maintenance of the restoration areas. The overall impact on park operations would be long-term, negligible, and adverse.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Changes in visitation, overnight accommodations, employee housing, and transportation infrastructure and management would have a parkwide, long-term, minor, beneficial impacts on park operations and facilities.</p>	<p><u>Segment 2</u></p> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>Restoration projects would require a considerable amount of park staff time and resources.</p> <p>These actions would benefit parkwide operations because they would lessen the need for future restoration. However, they would also increase the need for ongoing monitoring and maintenance of the restoration areas. The overall impact on park operations would be long-term, negligible, and adverse.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Changes in visitation, overnight accommodations, employee housing, and transportation infrastructure and management would have a parkwide, long-term, negligible minor, beneficial impacts on park operations and facilities.</p>	<p><u>Segment 2</u></p> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>Restoration projects would require a considerable amount of park staff time and resources.</p> <p>These actions would benefit parkwide operations because they would lessen the need for future restoration. However, they would also increase the need for ongoing monitoring and maintenance of the restoration areas. The overall impact on park operations would be long-term, negligible, and adverse.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Changes in visitation, overnight accommodations, employee housing, and transportation infrastructure and management would have a parkwide, long-term, negligible to minor, adverse impacts on park operations and facilities.</p>

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
12. Park Operations and Facilities (cont.)					
<u>Segment 3 &amp; 4</u>  Park staff would continue to incur a long-term, negligible to minor, adverse impact associated with the incremental management of the impacts stemming from existing developments.  There would continue to be no concessioner-operated lodging or campgrounds within these segments and thus a long-term, negligible adverse impact would result.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Development and implementation of oak tree protective measures would have a short-term, negligible, adverse effect on staff operations. The consequent long-term impact on park operations would be negligible and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  New high-density concessioner housing would be constructed in Abbieville and Rancheria. New housing would also be constructed in El Portal Village Center.  The park would experience a short-term, moderate, adverse operational impact associated with the planning, design, relocation, and construction of new projects. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the increase in residential occupants.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Development and implementation of oak tree protective measures would have a short-term, negligible, adverse effect on staff operations. The consequent long-term impact on park operations would be negligible and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  New high-density concessioner housing would be constructed in Rancheria. New housing would also be constructed in Rancheria and El Portal Village Center.  The park would experience a short-term, minor, adverse operational impact associated with the planning, design, relocation, and construction of new projects. These actions would also result in a long-term, negligible, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the increase in residential occupants.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Development and implementation of oak tree protective measures would have a short-term, negligible, adverse effect on staff operations. The consequent long-term impact on park operations would be negligible and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  New high-density concessioner housing would be constructed in Rancheria. New housing would also be constructed in Rancheria and El Portal Village Center.  The park would experience a short-term, minor to moderate, adverse operational impact associated with the planning, design, relocation, and construction of new projects. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the increase in residential occupants.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Development and implementation of oak tree protective measures would have a short-term, negligible, adverse effect on staff operations. The consequent long-term impact on park operations would be negligible and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  New high-density concessioner housing would be constructed in Rancheria. New housing would also be constructed in Rancheria and El Portal Village Center.  The park would experience a short-term, minor to moderate, adverse operational impact associated with the planning, design, relocation, and construction of new projects. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the increase in residential occupants.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Development and implementation of oak tree protective measures would have a short-term, negligible, adverse effect on staff operations. The consequent long-term impact on park operations would be negligible and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  New high-density concessioner housing would be constructed in Rancheria and Abbieville. New housing would also be constructed in Rancheria and El Portal Village Center. The park would experience a short-term, moderate, adverse operational impact associated with the planning, design, relocation, and construction of new projects. These actions would also result in a long-term, minor, adverse impact on park operations associated with management and maintenance of the new facilities; and the law enforcement and emergency medical services to accommodate the increase in residential occupants.
<u>Segment 6 &amp; 7</u>  Park staff would continue to experience a long-term, negligible, adverse impact associated with the ongoing maintenance of infrastructure, specifically wastewater infrastructure, to avoid or minimize impacts on water supply and quality.  Long-term management of impacts associated with development near the channel would continue to impose a negligible, adverse operational burden on the park.	<u>Segment 6 &amp; 7</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values include removal of the Wawona Golf Course would noticeably but temporarily disrupt the work of park staff. The undertaking would have a short-term, minor, adverse impact on park operations. Park staff would still incur a long-term, negligible to minor, adverse operational burden associated with monitoring and maintenance of these restoration areas.	<u>Segment 6 &amp; 7</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values include removal of the Wawona Golf Course would noticeably but temporarily disrupt the work of park staff. The undertaking would have a short-term, minor, adverse impact on park operations. Park staff would still incur a long-term, negligible, adverse operational burden associated with monitoring and maintenance of these restoration areas.	<u>Segment 6 &amp; 7</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Biological Resource Actions.</i> Specific projects include the relocation of stock use campsites. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The park would experience a short-term, negligible to minor, adverse operational impact associated with the planning and	<u>Segment 6 &amp; 7</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Biological Resource Actions.</i> Specific projects include the relocation of stock use campsites. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The park would experience a short-term, negligible to minor, adverse operational impact associated with the planning and	<u>Segment 6 &amp; 7</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  <i>Biological Resource Actions.</i> Specific projects include the relocation of stock use campsites. The resulting impacts on park operations would be parkwide, short-term, negligible, and adverse.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The park would experience a short-term, negligible to minor, adverse operational impact associated with the planning and

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
<b>12. Park Operations and Facilities (cont.)</b>					
<u>Segment 6 &amp; 7</u> (cont.)	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The park would experience a short-term, minor, adverse operational impact associated with the planning and execution of new projects. These actions would result in a long-term, minor, adverse impact on park operations associated with restoration monitoring and maintenance.  Reduction in size of the Wawona Campground would result in a long-term, parkwide, minor, beneficial impact on park operations required to manage and maintain these facilities.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The park would experience a short-term, minor, adverse operational impact associated with the planning and execution of new projects. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.  Reduction in size of the Wawona Campground would result in a long-term, parkwide, negligible to minor, beneficial impact on park operations required to manage and maintain these facilities.	execution of new projects. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.  Reduction in size of the Wawona Campground would result in a long-term, parkwide, negligible to minor, beneficial impact on park operations required to manage and maintain these facilities.	execution of new projects. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.  Reduction in size of the Wawona Campground would result in a long-term, parkwide, negligible, beneficial impact on park operations required to manage and maintain these facilities.	execution of new projects. These actions would result in a long-term, negligible, adverse impact on park operations associated with restoration monitoring and maintenance.  Reduction in size of the Wawona Campground would result in a long-term, parkwide, negligible, beneficial impact on park operations required to manage and maintain these facilities.
<u>Cumulative Impacts</u>  The cumulative effect would be long-term, negligible, and beneficial.	<u>Cumulative Impacts</u>  The cumulative impact of Alternative 2, in light of past, present, and reasonably foreseeable future projects, would be long-term, moderate, and beneficial.	<u>Cumulative Impacts</u>  The cumulative impact of Alternative 3, in light of past, present, and reasonably foreseeable future projects, would be long-term, moderate, and beneficial.	<u>Cumulative Impacts</u>  The cumulative impact of Alternative 4, in light of past, present, and reasonably foreseeable future projects, would be long-term, minor to moderate, and beneficial.	<u>Cumulative Impacts</u>  The cumulative impact of Alternative 5, in light of past, present, and reasonably foreseeable future projects, would be long-term, minor, and beneficial.	<u>Cumulative Impacts</u>  The cumulative impact of Alternative 6, in light of past, present, and reasonably foreseeable future projects, would be long-term, negligible, and beneficial.
<b>13. Transportation</b>					
<u>Segment 1, 5, 6 &amp; 8</u>  No impact as there are no transportation facilities in these segments.	<u>Segment 1, 5, 6 &amp; 8</u>  No impact as there are no transportation facilities in these segments.	<u>Segment 1, 5, 6 &amp; 8</u>  No impact as there are no transportation facilities in these segments.	<u>Segment 1, 5, 6 &amp; 8</u>  No impact as there are no transportation facilities in these segments.	<u>Segment 1, 5, 6 &amp; 8</u>  No impact as there are no transportation facilities in these segments.	<u>Segment 1, 5, 6 &amp; 8</u>  No impact as there are no transportation facilities in these segments.
<u>Segment 2</u>  There could be segmentwide, long-term, minor to moderate, adverse impacts on transportation conditions from the continuation of current transportation management actions to address increases in park visitation, increases in traffic volumes on the park roadways, and increased parking demand that exceeds the parking supply (i.e., a larger parking deficit).	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Under this alternative, traffic flow and circulation would be improved and an at-grade pedestrian crossing to alleviate pedestrian/vehicle conflicts would be constructed. Actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Under this alternative, traffic flow and circulation would be improved and an at-grade pedestrian crossing to alleviate pedestrian/vehicle conflicts would be constructed. Actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Under this alternative, traffic flow and circulation would be enhanced with roadway improvements and construction of a pedestrian underpass. Actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.	<u>Segment 2</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would primarily have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
13. Transportation (cont.)					
<u>Segment 2</u> (cont.)	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Transportation and circulation would be improved due to the day use permit parking system, and the resulting substantially lower use levels, approximately 33% decrease from existing peak-day conditions. These actions would have segmentwide, moderate, long-term, beneficial impacts.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Transportation and circulation would be improved due to the day use reservation system with substantially lower use levels, approximately 37% decrease from existing peak-day conditions. These actions would have segmentwide, moderate, long-term, beneficial impacts.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Transportation and circulation would be improved due to the day use reservation system with substantially lower use levels, approximately 19% decrease from existing peak-day conditions, as well as expansion of regional bus service and the Valley shuttle. These actions would have segmentwide, moderate, long-term, beneficial impacts.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Implementation of the day use capacity management system, additional parking spaces, and transportation system improvements would lessen traffic jams, and improve the chance that visitors entering Yosemite have a place to park. These actions would have segmentwide, major, long-term, beneficial impacts on transportation conditions.	<i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Although the total number of daily visitors to Yosemite Valley would be slightly higher than existing peak-day numbers, the implementation of the day use capacity management system, additional parking spaces, and transportation system improvements would lessen traffic jams, and ensure that visitors entering the park have a place to park (thus eliminating unnecessary circling). These management actions would have segmentwide, moderate, long-term, beneficial impacts on transportation conditions.
<u>Segment 3 &amp; 4</u>  Continuation of current transportation management actions to address increases in park visitation, increases in traffic volumes on the park roadways, and parking demand that exceeds supply, leading to a continuing deterioration of the quality of the transportation experience by prolonging time spent traveling in the park in a vehicle would occur. As such, there would be segmentwide, long-term, minor, adverse impacts.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The total number of daily visitors would not change from existing peak-day conditions, and public transit would be expanded. As such, these actions would have segmentwide, minor, long-term, beneficial impacts on transportation conditions.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The total number of daily visitors would not change from existing peak-day conditions, and public transit would be expanded. As such, these actions would have segmentwide, minor, long-term, beneficial impacts on transportation conditions.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The total number of daily visitors would not change from existing peak-day conditions, public transit would be expanded, and a new remote, 200-space visitor day parking area would be provided. Combined, these actions would have segmentwide, minor, long-term, beneficial impacts on transportation conditions.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, minor, adverse short-term transportation effects associated with restoration construction activities.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The total number of daily visitors would not change from existing peak-day conditions, public transit would be expanded, and a new remote, 200-space visitor day parking area would be provided. Combined, these actions would have segmentwide, moderate, long-term, beneficial impacts on transportation conditions.	<u>Segment 3 &amp; 4</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  The total number of daily visitors would not change from existing peak-day conditions, public transit would be expanded, and a new remote, 200-space visitor day parking area would be provided. These management actions would have corridorwide, moderate, long-term, beneficial impacts on transportation conditions.

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
13. Transportation (cont.)					
<u>Segment 7</u> Continuation of current transportation management actions to address increases in park visitation, traffic volumes on the park roadways, and parking demand that exceeds the parking supply would occur. As such, there could be segmentwide, long-term, minor, adverse impacts.	<u>Segment 7</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Because no significant changes to the kinds and amounts of use are proposed, and the total number of daily visitors would be unchanged from existing peak-day conditions, impacts of Alternative 2 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.	<u>Segment 7</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Because no significant changes to the kinds and amounts of use are proposed, and the total number of daily visitors would be unchanged from existing peak-day conditions, impacts of Alternative 2 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.	<u>Segment 7</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Because no significant changes to the kinds and amounts of use in Segment 7 are proposed, and the total number of daily visitors would be unchanged from existing peak-day conditions, impacts of Alternative 2 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.	<u>Segment 7</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Because no significant changes to the kinds and amounts of use are proposed, and the total number of daily visitors would be unchanged from existing peak-day conditions, impacts of Alternative 2 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.	<u>Segment 7</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions to protect and enhance river values would have segmentwide, short-term, minor, adverse transportation effects associated with restoration construction activities, but would have no long-term impacts because increased traffic would cease with completion of the construction work.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Because no significant changes to the kinds and amounts of use are proposed, and the total number of daily visitors would be unchanged from existing peak-day conditions, impacts of Alternative 2 actions would be similar to those of Alternative 1 (No Action), and result in segmentwide, long-term, minor, adverse impacts on transportation conditions in Segment 7.
<u>Cumulative Impacts</u> Cumulative projects are not anticipated to affect transportation conditions on Segments 1, 5, 6, and 8, and therefore, no cumulative impacts would occur. For segments 2, 3, 4 and 7, camping, lodging, parking, and circulation facilities are assumed to remain in their current locations, in their current conditions, and at their current capacities. Consequently, traffic congestion and delays would continue to occur at busy intersections resulting in segment-wide, long-term, minor, adverse impacts on transportation conditions.	<u>Cumulative Impacts</u> Cumulative projects would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, improvements realized through cumulative projects would further enhance the moderate, long-term, beneficial impacts.	<u>Cumulative Impacts</u> Cumulative projects would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through cumulative projects would further enhance the moderate, long-term, beneficial impacts on transportation.	<u>Cumulative Impacts</u> Cumulative projects would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through cumulative projects would further enhance the moderate, long-term, beneficial impacts on transportation.	<u>Cumulative Impacts</u> Cumulative projects would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through cumulative projects would further enhance the moderate, long-term, beneficial impacts on transportation.	<u>Cumulative Impacts</u> Cumulative projects would result in a local, short-term, minor, adverse impact on transportation during construction periods. However, the improvements realized through cumulative projects would further enhance the moderate, long-term, beneficial impacts on transportation.

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
14. Energy Consumption and Climate Change					
<u>Segment 1, 5, 6 &amp; 8</u> No new buildings or facilities would be constructed as part of Alternative 1, so no substantial new sources of energy consumption or emissions would be introduced. Although park visitation would be expected to increase, these segments do not have transportation facilities and are relatively inaccessible, so visitor use in these areas would not likely increase at the same rate. Therefore, this is a long-term and negligible impact.	<u>Segment 1, 5, 6 &amp; 8</u> No new buildings and facilities would be constructed, so no substantial new sources of energy consumption or emissions would be introduced. Maximum overnight capacity and total daily use levels would be less than under Alternative 1. With fewer on-road vehicles in the vicinity, the overall effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial	<u>Segment 1, 5, 6 &amp; 8</u> No new buildings and facilities would be constructed so no substantial new sources of energy consumption or emissions would be introduced. Maximum overnight capacity and total daily use levels would be less than under Alternative 1. With fewer on-road vehicles in the vicinity, the overall effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial.	<u>Segment 1, 5, 6 &amp; 8</u> No new buildings and facilities would be constructed so no substantial new sources of energy consumption or emissions would be introduced. Maximum overnight capacity and total daily use levels would be less than under Alternative 1. With fewer on-road vehicles in the vicinity, the overall effect on energy would be long term, negligible to minor, and beneficial.	<u>Segment 1, 5, 6 &amp; 8</u> No new buildings and facilities would be constructed within these segments so no substantial new sources of energy consumption or emissions would be introduced. Maximum overnight capacity and total daily use levels would be less than under Alternative 1. With fewer on-road vehicles in the vicinity, the overall effect on energy consumption and GHGs would be long term, negligible, and beneficial.	<u>Segment 1, 5, 6 &amp; 8</u> No new buildings and facilities would be constructed so no substantial new sources of energy consumption or emissions would be introduced. With more on-road vehicles in the vicinity, the overall effect on energy consumption and GHGs would be long term, negligible, and adverse
<u>Segment 2, 3, 4 &amp; 7</u> There would be long-term, moderate beneficial impacts associated with the continuation of NPS climate-action-plan sustainability strategies; however, because mobile sources generate the vast majority of all GHGs in the park, and visitation is projected to increase, an overall long-term, minor, adverse impact related to energy and GHGs would occur.	<u>Segment 2</u> Maximum overnight visitation and total daily use levels would be 26% and 33% less, respectively, than under Alternative 1. Reduced housing or lodging would result in a proportional reduction in area GHG emissions sources and facility energy usage. Since campsites would be reduced along this segment, there would also be a proportional reduction in campfire GHG emissions. With fewer on-road vehicles and potential area sources, the overall effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial.	<u>Segment 2</u> Maximum overnight visitation and total daily use levels would be 23% and 37% less, respectively, than under Alternative 1. Reduced housing and lodging would result in a proportional reduction in area GHG emissions sources in facility energy usage. Since campsites would be increased along this segment, there would also be a proportional increase in campfires, which would result in a long-term, negligible, adverse impact for GHG emissions. However, with fewer on-road vehicles and potential area sources under Alternative 3, the overall effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial.	<u>Segment 2</u> Maximum overnight visitation would be 7% greater and total daily use levels would be 19% less than under Alternative 1. Since campsites would be increased along this segment, there would also be a proportional increase in campfire GHG emissions, which would be a long-term, negligible to minor, adverse impact. Reduced housing and lodging would result in a proportional reduction in area GHG emissions sources and in facility energy usage. Overall, with fewer on-road vehicles and potential area sources, the effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial.	<u>Segment 2</u> Maximum overnight visitation would be 16% greater and total daily use levels would be 5% less than under Alternative 1. Since campsites would be increased along this segment, which would have a long-term, negligible to minor, adverse impact. With fewer on-road vehicles, despite increased lodging, energy consumption and related GHG emissions would be long term, negligible to minor, and beneficial.	<u>Segment 2</u> Maximum overnight capacity and total daily use levels would be 33% and 6% greater, respectively, than under Alternative 1. Since campsites would be increased along this segment, a long-term, negligible to minor, adverse impact would occur. Reduced housing would result in a proportional reduction, while increased lodging would contribute to a proportional increase in area GHG emissions sources and in facility energy usage. With more on-road vehicles and potential area sources, the overall effect on energy consumption and GHGs would be long term, negligible, and adverse.
<u>Segments 3 &amp; 4</u> There would be long-term, moderate beneficial impacts associated with the continuation of NPS climate-action-plan sustainability strategies; however, because mobile sources generate the vast majority of all GHGs in the park, and visitation is projected to increase, an overall long-term, minor, adverse impact related to energy and GHGs would occur.	<u>Segments 3 &amp; 4</u> Increased housing would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage. Reduced visitation would have the opposite effect due to fewer vehicles on the road. The overall effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial.	<u>Segments 3 &amp; 4</u> Increased housing would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage. Reduced visitation would have the opposite effect due to fewer vehicles on the road. The overall effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial.	<u>Segments 3 &amp; 4</u> Increased housing would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage. Reduced visitation would have the opposite effect due to fewer vehicles on the road. The overall effect on energy consumption and GHGs would be long term, negligible to minor, and beneficial.	<u>Segments 3 &amp; 4</u> Increased housing would result in a proportional increase in area GHG emissions sources (such as maintenance/landscaping, natural gas combustion for heating/cooling) and in facility energy usage. Reduced visitation would have the opposite effect due to fewer vehicles on the road. The overall effect on energy consumption and GHGs would be long term, negligible, and beneficial.	<u>Segments 3 &amp; 4</u> No new buildings and facilities would be constructed so no substantial new sources of energy consumption or emissions would be introduced. With more on-road vehicles in the vicinity, the overall effect on energy consumption and GHGs would be long term, negligible, and adverse.

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Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
14. Energy Consumption and Climate Change (cont.)					
	<u>Segment 7</u> Total daily use levels would not change and overnight visitation would be less than under Alternative 1. The removal of the golf course for ecological restoration and the removal of the Wawona stables would have a beneficial effect. Energy consumption and GHGs associated with these facilities would be reduced, which would result in a long-term, negligible to minor, beneficial impact. Since campsites would be reduced along this segment, there would also be a proportional reduction in campfire GHG emissions, which would have a long-term, negligible, beneficial impact.	<u>Segment 7</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1. The removal of the golf course for ecological restoration would have a beneficial effect. Energy consumption and GHGs associated with this facility would be reduced, which would have a long-term, negligible to minor, beneficial impact. Since campsites would be reduced along this segment, there would also be a proportional reduction in campfire GHG emissions, which would have a long-term, negligible, beneficial impact.	<u>Segment 7</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1. Since campsites would be reduced along this segment, there would also be a proportional reduction in campfire GHG emissions, which would have a long-term, negligible, beneficial impact.	<u>Segment 7</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1. Since campsites would be reduced along this segment, there would also be a proportional reduction in campfire GHG emissions, which would have a long-term, negligible, beneficial impact.	<u>Segment 7</u> Total daily use levels would not change and maximum overnight visitation would be less than under Alternative 1. Since campsites would be reduced along this segment, there would also be a proportional reduction in campfire GHG emissions, which would have a long-term, negligible, beneficial impact.
<u>Cumulative Impacts</u> Long-term, minor, adverse	<u>Cumulative Impacts</u> With reduced daytime and nighttime visitor capacity and continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies proposed management actions would also result in a long-term, cumulatively beneficial energy and climate change impact from reduced VMT and facility energy usage.	<u>Cumulative Impacts</u> With reduced daytime and nighttime visitor capacity and continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, proposed management actions would result in a long-term, cumulatively beneficial energy and climate change impact from reduced VMT and facility energy usage.	<u>Cumulative Impacts</u> With reduced overall daily visitor capacity and continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, Alternative 4 would result in a long-term, cumulatively beneficial energy and climate change impact from reduced VMT and associated fuel usage and GHG emissions. However, an increased number of campsites could result in an adverse impact.	<u>Cumulative Impacts</u> With reduced overall visitor capacity and continued management of traffic and encouragement of alternative forms of transportation, as well as continuation of NPS climate-action-plan sustainability strategies, Alternative 5 would result in a long-term, cumulatively beneficial effect on energy and climate change from reduced VMT and associated fuel usage and GHG emissions. However, an increased number of lodging units and campsites would result in an adverse impact from increased area source GHG emissions.	<u>Cumulative Impacts</u> With increased overall visitor capacity, number of campsites, and number of lodging units, Alternative 6 would result in a long-term, cumulatively adverse impact on energy and climate change from increased VMT, associated fuel usage and GHG emissions.
15. Socioeconomics					
<u>All Segments</u> Current trends would be expected to continue, and include full occupancy of lodging and day parking in the park during peak use periods, which implies there is additional unmet demand for visits to the park. Some of that unmet demand may increase the demand for visitor services in gateway communities. This impact would result in a regional, long term, negligible and beneficial effect.	<u>All Segments</u> This alternative would support 517 fewer jobs than Alternative 1, and because it would be less than 2.5% fewer jobs the impact would be regional, long term, negligible, and adverse.	<u>All Segments</u> Under a capacity-constrained scenario, this alternative would support 544 fewer jobs than Alternative 1, resulting in a long-term, adverse, and negligible impact.	<u>All Segments</u> Under a capacity-constrained scenario, this alternative would support 110 fewer jobs than Alternative 1, resulting in a long-term, adverse, and negligible impact.	<u>All Segments</u> This alternative would support four fewer jobs, resulting in long-term, regional, negligible, and adverse impacts.	<u>All Segments</u> This alternative would support approximately 356 more jobs than Alternative 1, resulting in long-term, regional, negligible, and beneficial impacts.

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Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
15. Socioeconomics (cont.)					
<u>Cumulative Impacts</u> The overall cumulative effect would be that visitation is likely to continue to grow at an average rate of approximately 3% per year, and current total annual visitation would remain near the historic high experienced over the last decade. Therefore, the cumulative economic impact would be regional, long term, negligible, and beneficial.	<u>Cumulative Impacts</u> If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may result in private interests expanding the supply in surrounding areas. Additional demand may be satisfied by increasing hours and seasons of operations, and adding additional staff to expand capacities. The cumulative impact would be regional, long term, negligible, and adverse.	<u>Cumulative Impacts</u> If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may result in private interests expanding the supply in surrounding areas. Additional demand may be satisfied by increasing hours and seasons of operations, and adding additional staff to expand capacities. The cumulative impact would be regional, long term, negligible, and adverse.	<u>Cumulative Impacts</u> If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may result in private interests expanding the supply in surrounding areas. Additional demand may be satisfied by increasing hours and seasons of operations, and adding additional staff to expand capacities. The cumulative impact would be regional, long term, negligible, and adverse.	<u>Cumulative Impacts</u> If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may result in private interests expanding the supply in surrounding areas. Additional demand may be satisfied by increasing hours and seasons of operations, and adding additional staff to expand capacities. The cumulative impact would be regional, long term, negligible, and adverse.	<u>Cumulative Impacts</u> If public management actions reduce the supply of lodging and other commercial amenities within the park, demand pressures may result in private interests expanding the supply in surrounding areas. Additional demand may be satisfied by increasing hours and seasons of operations, and adding additional staff to expand capacities. The cumulative impact would be regional, long term, negligible, and beneficial.
16. Historic Buildings, Structures, and Cultural Landscapes					
<u>Segment 1</u> Under this alternative, impacts on these resources would be negligible under NEPA criteria as management of resources and structures would remain the same.	<u>Segment 1</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  There are no actions to protect and enhance river values proposed that would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in a major, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District under NEPA.  <i>Segment 1 Impact Summary.</i>  Overall actions in Segment 1 would result in a major, long term, local adverse impact on historic resources.	<u>Segment 1</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions to protect and enhance river values would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use would result in a major, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District under NEPA.  <i>Segment 1 Impact Summary.</i>  Overall actions in Segment 1 would result in a major, long term, local adverse impact on historic resources.	<u>Segment 1</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions to protect and enhance river values would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in a major, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District.  <i>Segment 1 Impact Summary.</i>  Overall actions in Segment 1 would result in a major, long term, local adverse impact on historic resources.	<u>Segment 1</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions to protect and enhance river values would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions to manage visitor use and facilities would result in a negligible, long term, local adverse impact on the Merced Lake High Sierra Camp Historic District under NEPA.  <i>Segment 1 Impact Summary.</i>  Overall actions in Segment 1 would result in a moderate, long term, local adverse impact on historic resources.	<u>Segment 1</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions to protect and enhance river values would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  No actions to manage visitor use and facilities would result in an adverse impact on historic resources.  <i>Segment 1 Impact Summary.</i>  Overall actions in Segment 1 would result in no adverse impact on historic resources.
<u>Segment 2</u> Impacts on the majority of resources would be negligible under NEPA criteria, although there would be minor, segment-wide, adverse effects to the Yosemite Valley Historic District.  Overall actions in Segment 2 would result in a long term, local, minor adverse impacts on historic resources.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Biological resource actions to protect and enhance river values would result in minor or moderate, local, long term adverse impacts on the listed Yosemite Valley Historic District under NEPA.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Biological resource actions to protect and enhance river values would result in minor, local, long term adverse impacts on the listed Yosemite Valley Historic District under NEPA.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Biological resource actions to protect and enhance river values would result in moderate, local, long term adverse impacts on the listed Yosemite Valley Historic District under NEPA.	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Biological resource actions would involve the restoration of the meadow to its historic setting would result in a long term, local, beneficial impacts to the Yosemite Valley Historic District through restoration of meadows. Impacts resulting	<u>Segment 2</u> <i>Impacts of Actions to Protect and Enhance River Values</i>  Biological resource actions to protect and enhance river values would result in minor or beneficial, local, long term adverse impacts on the listed Yosemite Valley Historic District through restoration of meadows. Impacts resulting

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Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
<b>16. Historic Buildings, Structures, and Cultural Landscapes (cont.)</b>					
<u>Segment 2</u> (cont.)	<p>Hydrologic/geologic resource and non-specified resources actions to protect and enhance river values would result in long term, major, local, adverse impacts to both the Yosemite Valley Historic District and the Yosemite Village Historic District under NEPA.</p> <p>Cultural resource actions to protect and enhance river values would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Actions to manage visitor use and facilities, including removal and alteration of contributing resources, in would result in long term, local, moderate to major adverse impacts to Yosemite Valley Historic District and the Yosemite Village Historic District under NEPA.</p> <p>Overall actions in Segment 2 would result in a long term, local, moderate to major adverse impacts on historic resources.</p>	<p>Hydrologic/geologic resource actions to protect and enhance river values would result in major, long term, local, adverse impacts on both the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA.</p> <p>Cultural resource actions to protect and enhance river values would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Actions to manage visitor use and facilities would result in long term, local, major to moderate adverse impacts to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p>Overall actions in Segment 2 would result in a long term, local, moderate to major adverse impacts on historic resources.</p>	<p>Hydrologic/geologic resource actions to protect and enhance river values would result in major, long term, local, adverse impacts on both the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA.</p> <p>Cultural resource actions to protect and enhance river values would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Actions to protect and enhance river values would result in long term, local, moderate to major adverse impacts to the Camp Curry Historic District, Yosemite Village Historic District and the Yosemite Valley Historic District under NEPA.</p> <p>Overall actions in Segment 2 would result in a long term, local, moderate to major adverse impacts on historic resources.</p>	<p>from rerouting the Valley Loop Trail would require additional analysis prior to determination of impact</p> <p>Hydrologic/geologic resource actions to protect and enhance river values would result in major, long term, local, adverse impact on the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District under NEPA.</p> <p>Cultural resource actions to protect and enhance river values would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Actions would result in long term, local, moderate to major adverse impacts to both the Camp Curry Village Historic District and Yosemite Valley Historic District.</p> <p>Overall actions in Segment 2 would result in a long term, local, moderate to major adverse impacts on historic resources.</p>	<p>from rerouting the Valley Loop Trail would require additional analysis prior to determination of impact</p> <p>Hydrologic/geologic resource actions would result in long term, negligible adverse impacts on both the Yosemite Valley Bridges Historic District and the Yosemite Valley Historic District.</p> <p>Cultural resource actions to protect and enhance river values would result in a long term, moderate, local, beneficial impact to the Yosemite Valley and Yosemite Village Historic Districts under NEPA.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Actions would result in long term, local, moderate to major adverse impacts to both the Yosemite Valley Historic District.</p> <p>Overall actions in Segment 2 would result in a long term, local, moderate to major adverse impacts on historic resources.</p>
<u>Segment 3 &amp; 4</u> <p>Under this alternative, impacts on these resources would be negligible under NEPA criteria as management of resources and structures would remain the same.</p> <p>Overall actions in Segments 3-4 would result in a long term, local, negligible adverse impacts on historic resources.</p>	<u>Segment 3 &amp; 4</u> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>No actions to protect and enhance river values within would result in an adverse impacts on historic resources.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Impacts from actions to manage visitor use and facilities would require additional analysis prior to the determination of impact on historic resources in El Portal.</p> <p>Overall actions in Segments 3-4 would require additional analysis prior to the determination of impact on historic resources in El Portal.</p>	<u>Segment 3 &amp; 4</u> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>No actions intended to protect and enhance river values are anticipated to result in an adverse impacts on historic resources.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Removal or addition of facilities would potentially result in an adverse effect, but without further studies, it is not possible to determine the impact of this action under NEPA.</p> <p>Overall actions in Segments 3-4 would require additional analysis prior to the determination of impact on historic resources in El Portal.</p>	<u>Segment 3 &amp; 4</u> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>Actions intended to protect and enhance river values would not be likely to result in adverse impacts on historic resources.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Impacts from actions to manage visitor use and facilities would require additional analysis prior to the determination of impact on historic resources in El Portal under NEPA.</p> <p>Overall actions in Segments 3-4 would require additional analysis prior to the determination of impact on historic resources in El Portal.</p>	<u>Segment 3 &amp; 4.</u> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>Actions intended to protect and enhance river values would not be likely to result in adverse impacts on historic resources.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Removal or addition of facilities would potentially result in an adverse effect, but without further studies, it is not possible to determine the impact of this action under NEPA</p> <p>Overall actions in Segments 3-4 would require additional analysis prior to the determination of impact on historic resources in El Portal.</p>	<u>Segment 3 &amp; 4</u> <p><i>Impacts of Actions to Protect and Enhance River Values</i></p> <p>Actions intended to protect and enhance river values would not be likely to result in adverse impacts on historic resources.</p> <p><i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i></p> <p>Construction of new housing in El Portal would potentially result in an adverse effect to the historic setting, but without further studies, it is not possible to determine the impact of this action under NEPA resources.</p> <p>Overall actions in Segments 3-4 would require additional analysis prior to the determination of impact on historic resources in El Portal.</p>

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16. Historic Buildings, Structures, and Cultural Landscapes (cont.)					
<u>Segment 5,6,7, &amp; 8</u>  Potential impacts under this alternative would include ongoing degradation of resources from visitor and operational use; however, ongoing maintenance and rehabilitation would result in negligible impacts under NEPA criteria.  Overall actions in Segments 5-8 would result in a long term, local, negligible adverse impacts on historic resources.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions to protect and enhance river values would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Implementation of this alternative would have a long term, minor, local, adverse impact on the Wawona Hotel and Pavilion Historic District, Pioneer Yosemite History Center, and Wawona Hotel and Thomas Hill Studio National Historic Landmark.  Overall actions in Segments 5-8 would result in a long term, local, minor adverse impacts on historic resources.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions to protect and enhance river values would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Implementation of this alternative would have a long term, minor, local, adverse impact on the Wawona Hotel and Pavilion Historic District, Pioneer Yosemite History Center, and Wawona Hotel and Thomas Hill Studio National Historic Landmark.  Overall actions in Segments 5-8 would result in a long term, local, minor adverse impacts on historic resources.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions to protect and enhance river values would result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions intended to manage visitor use and facilities would long term, local, minor adverse impact Pioneer Yosemite History Center.  Overall actions in Segments 5-8 would result in a long term, local, minor adverse impacts on historic resources.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  Actions intended to protect and enhance river values would not be likely to result in adverse impacts on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  No actions intended to manage visitor use and facilities are anticipated to result in an adverse impact on historic resources.  Overall actions in Segments 5-8 would result in no anticipated adverse impacts to historic resources.	<u>Segment 5,6,7, &amp; 8</u>  <i>Impacts of Actions to Protect and Enhance River Values</i>  No actions intended to protect and enhance river values are anticipated to result in an adverse impact on historic resources.  <i>Impacts of Actions to Manage User Capacity, Land Use, and Facilities</i>  Actions intended to manage visitor use and facilities would long term, local, minor adverse impact Pioneer Yosemite History Center under NEPA.  Overall actions in Segments 5-8 would result in a long term, local, minor adverse impacts on historic resources.
<u>Cumulative Impacts</u>  There would be no change in the treatment and management of historic buildings, structures, and cultural landscape resources. Any site-specific planning and compliance actions would be accomplished in accordance with stipulations in the park’s 1999 programmatic agreement. The results of the benign neglect would contribute towards a moderate adverse cumulative effect.	<u>Cumulative Impacts</u>  This alternative would involve impacts to several National Register-eligible, listed, or National Historic Landmark structures (Merced Lake High Sierra Camp, Camp Curry Historic District, the Yosemite Valley Historic District, the Yosemite Valley Bridges Historic District, the Yosemite Village Historic District, NR Ahwahnee Hotel, and the Wawona Hotel and Pavilion Historic District.). Additionally, relocation, alteration, or removal of National Register-eligible, listed, or National Historic Landmark structures would occur, potentially resulting in a long-term, major, adverse impact on both the individual cultural resources and districts, and the cumulative historic fabric of the Merced River corridor. The potential effect on the character-defining features of historic resources within the Merced River corridor would result in an adverse cumulative impact on historic resources.	<u>Cumulative Impacts</u>  The alteration or removal of historic resources (including Merced Lake High Sierra Camp, Camp Curry Historic District, the Yosemite Valley Historic District, Camp 4, the Ahwahnee Hotel, the Yosemite Valley Bridges Historic District, the Pioneer Yosemite History Center, and the Wawona Hotel and Pavilion Historic District) would potentially result in a long-term, moderate to major, adverse impact on both the individual resources and districts and the cumulative historic fabric of the Merced River corridor. The potential effect on the character-defining features of historic resources within the Merced River corridor would result in an adverse cumulative impact on historic resources.	<u>Cumulative Impacts</u>  Demolition, alteration, or relocation of several National Register-eligible or -listed structures and historic districts (Merced Lake High Sierra Camp, Camp Curry Historic District, NR Ahwahnee Hotel, Camp 4, Yosemite Valley Historic District, and the Yosemite Valley Bridges Historic District) would potentially result in a long-term, moderate to major, adverse impact on both the individual cultural resources and districts, and the cumulative historic fabric of the Merced River corridor. The potential effect on the character-defining features of historic resources within the river corridor would result in a long-term, moderate adverse cumulative impact on historic resources.	<u>Cumulative Impacts</u>  Demolition, alteration, or relocation of several National Register-eligible or -listed structures and historic districts (Merced Lake High Sierra Camp, Camp Curry Historic District, the Yosemite Valley Historic District, Yosemite Village Historic District, and the Yosemite Valley Bridges Historic District) would potentially result in a long-term, moderate, adverse impact on both the individual cultural resources and districts, and the cumulative historic character of the Merced River corridor. The potential effect on the character-defining features of historic resources within the river corridor would result in a long-term, moderate, local adverse cumulative impacts on historic resources.	<u>Cumulative Impacts</u>  Alteration or relocation of several National Register-eligible or -listed structures or districts (Camp Curry Historic District, the Yosemite Valley Historic District, and the Yosemite Valley Bridges Historic District) would potentially result in a long-term, minor, adverse impact on both the individual cultural resources and the cumulative historic fabric of the Merced River corridor. The potential effect on the character-defining features of historic resources within the river corridor would result in a long-term, moderate adverse cumulative impact on historic resources

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17. Archeological Resources					
<u>Segment 1</u> Ongoing impacts would be site-specific, negligible to minor, but potentially adverse impacts. Duration and type of impacts vary. For areas where proposed actions do not occur on or near known archeological sites, ongoing effects expected to be negligible to no adverse impact. (NEPA)	<u>Segment 1</u> Established trails are not known to be near known archeological sites. Corresponding impacts are expected to be negligible or non-existent. In the case of newly discovered archeological sites, found during ground disturbing activities trails may affect a small percentage of a site’s surface. Impacts would be correspondingly site-specific, negligible to minor, but potentially adverse impacts. Effects to specific sites are localized, and duration and type of impacts vary, depending on if the site can be avoided. (NEPA)	<u>Segment 1</u> Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in site-specific, long-term beneficial impacts on known archeological sites Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts on known archeological sites, in cases where avoidance is not possible.(NEPA)	<u>Segment 1</u> Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in site-specific, long-term beneficial impacts on known archeological sites Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts on known archeological sites, in cases where avoidance is not possible.(NEPA)	<u>Segment 1</u> Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in site-specific, long-term beneficial impacts on known archeological sites Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts on known archeological sites, in cases where avoidance is not possible.(NEPA)	<u>Segment 1</u> Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in site-specific, long-term beneficial impacts on known archeological sites Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts on known archeological sites, in cases where avoidance is not possible.(NEPA)
<u>Segment 2</u> Under this alternative, impacts would be ongoing, site-specific and local, minor to moderate, and likely adverse impacts (NEPA)	<u>Segment 2</u> If previously unknown archeological sites are discovered during associated ground disturbing activities, site-specific, short-term, minor, adverse impact may result, in cases where avoidance is not possible. Proposed removal of campsites and associated infrastructure would potentially result in localized, long-term beneficial effect on the known archeological sites found within the campgrounds. Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impact. Ground disturbance and rerouting of the Valley Loop Trail would result in a long-term major adverse impact as this trail is itself an historic property. Removing the northern abutment of Sugar Pine Bridge would potentially result in a long-term major adverse impact to the known archeological site. General reduction in focused visitor use at areas on or near known archeological resources would potentially result in site-specific, long-term beneficial impacts. Overall reduced visitor numbers would have a negligible effect on archeological sites. (NEPA)	<u>Segment 2</u> If previously unknown archeological sites are discovered during associated ground disturbing activities, site-specific, short-term, minor, adverse impacts may result, in cases where avoidance is not possible. Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in site-specific, long-term beneficial impacts on known archeological site. Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts on known archeological sites, in cases where avoidance is not possible. (NEPA)	<u>Segment 2</u> If previously unknown archeological sites are discovered during associated ground disturbing activities, site-specific, short-term, minor, adverse impacts may result, in cases where avoidance is not possible. Proposed reduction of camping and limiting numbers of hikers in Segment and associated removal of infrastructure would potentially result in site-specific, long-term beneficial impacts on known archeological site. Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts on known archeological sites, in cases where avoidance is not possible. (NEPA)	<u>Segment 2</u> If previously unknown archeological sites are discovered during associated ground disturbing activities, site-specific, short-term, minor, adverse impacts may result, in cases where avoidance is not possible. Proposed removal of campsites and associated infrastructure would potentially result in localized, long-term beneficial effect on the known archeological sites found within the campgrounds. Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts. Ground disturbance and rerouting of the Valley Loop Trail would result in a long-term major adverse impact, as this trail is itself an historic property. (NEPA)	<u>Segment 2</u> If previously unknown archeological sites are discovered during associated ground disturbing activities, site-specific, short-term, minor, adverse impacts may result, in cases where avoidance is not possible. Proposed removal of campsites and associated infrastructure would potentially result in localized, long-term beneficial effect on the known archeological sites found within the campgrounds. Ground disturbing activities associated with removal of infrastructure and restoration of former camping areas may result in site-specific, short-term, minor, adverse impacts. Ground disturbance and rerouting of the Valley Loop Trail would result in a long-term major adverse impact, as this trail is itself an historic property. (NEPA)

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
17. Archeological Resources (cont.)					
<u>Segment 3 &amp; 4</u>  Ongoing impacts would be site-specific, negligible to minor, but potentially adverse impacts. Duration and type of impacts vary. For areas where proposed actions do not occur on or near known archeological sites, ongoing effects expected to be negligible to no adverse impact. (NEPA)	<u>Segment 3 &amp; 4</u>  Removal of informal trails and infrastructure from their locations within archeological sites would result in a long-term, beneficial effect.  Potential site-specific, minor to moderate, adverse impacts from the relocation of housing units and removal of conifers could result from ground-disturbing activities and concentration of uses in areas sensitive for archeological sites.(NEPA)	<u>Segment 3 &amp; 4</u>  Removal of informal trails, abandoned infrastructure, asphalt, imported fill, and a gravel road from their locations within archeological sites would ultimately result in a long-term, beneficial impact Other ground disturbing activities in or near known archeological sites would be correspondingly site-specific, negligible to minor, but potentially adverse, if the site cannot be avoided. Impacts to specific sites are localized, and duration and type of impacts vary. (NEPA)	<u>Segment 3 &amp; 4</u>  Removal of informal trails, abandoned infrastructure, asphalt, imported fill, and a gravel road from their locations within archeological sites would ultimately result in a long-term, beneficial impact Other ground disturbing activities in or near known archeological sites would be correspondingly site-specific, negligible to minor, but potentially adverse, if the site cannot be avoided. Impacts to specific sites are localized, and duration and type of impacts vary.(NEPA)	<u>Segment 3 &amp; 4</u>  Removal of informal trails, abandoned infrastructure, asphalt, imported fill, and a gravel road from their locations within archeological sites would ultimately result in a long-term, beneficial impact Other ground disturbing activities in or near known archeological sites would be correspondingly site-specific, negligible to minor, but potentially adverse, if the site cannot be avoided. Impacts to specific sites are localized, and duration and type of impacts vary. (NEPA)	<u>Segment 3 &amp; 4</u>  Removal of informal trails, abandoned infrastructure, asphalt, imported fill, and a gravel road from their locations within archeological sites would ultimately result in a long-term, beneficial impact Other ground disturbing activities in or near known archeological sites would be correspondingly site-specific, negligible to minor, but potentially adverse, if the site cannot be avoided. Impacts to specific sites are localized, and duration and type of impacts vary. (NEPA)
<u>Segment 5,6,7, &amp; 8</u>  Impacts would be ongoing, site-specific and local, minor to moderate, and likely adverse impacts, especially within the known archeological areas, including the Wawona Archeological District, as well as several sites that are not contributors to the district. (NEPA)	<u>Segment 5,6,7, &amp; 8</u>  Ground disturbing activities may occur in or near known archeological sites. Impacts would be site-specific, negligible to major, and potentially adverse. Impacts to specific sites are localized, and duration and type of impacts vary, in cases where avoidance is not possible. Actions to remove two stock campsites from near known archeological sites would result in localized long-term, beneficial impacts by stabilizing elements of archeological features. (NEPA)	<u>Segment 5,6,7, &amp; 8</u>  Elimination of stables, relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas. During ground disturbing activities, impacts would be site-specific, minor to moderate, and potentially adverse. Impacts to specific sites are localized, and duration and type of impacts vary, in cases where avoidance is not possible.(NEPA)	<u>Segment 5,6,7, &amp; 8</u>  Continued use of golf course will occur in or near known archeological sites; impacts would likely be negligible as golf course fill covers the site. Elimination of stables, relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas. During ground disturbing activities, impacts would be site-specific, minor to moderate, and potentially adverse. Impacts to specific sites are localized, and duration and type of impacts vary, in cases where avoidance is not possible.(NEPA)	<u>Segment 5,6,7, &amp; 8</u>  Elimination of stables, relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas. During ground disturbing activities, impacts would be site-specific, minor to moderate, and potentially adverse. Impacts to specific sites are localized, and duration and type of impacts vary, in cases where avoidance is not possible.(NEPA)	<u>Segment 5,6,7, &amp; 8</u>  Elimination of stables, relocation of stock campsites, and removal of sites within the Wawona Campground may have a long-term, beneficial impact on archeological sites within and near these areas. During ground disturbing activities, impacts would be site-specific, minor to moderate, and potentially adverse. Impacts to specific sites are localized, and duration and type of impacts vary, in cases where avoidance is not possible.(NEPA)
<u>Cumulative Impacts</u>  There are a number of archeological resource sites in the Merced River corridor at, or adjacent to trails, structures, utility systems, and other facilities and are subject to ongoing disturbances such as trampling, surface collection, and ground disturbance associated with facility maintenance. Any present projects that would result in ground disturbance and/or excavation (trail/road improvements, new facility or infrastructure development, restoration) have the potential to result in site-specific, long-term adverse impacts on known or unknown archaeological resources, when avoidance is not possible. (NEPA)	<u>Cumulative Impacts</u>  Actions to remove facilities near, or reroute visitors from known archeological sites would result in localized long-term, beneficial impacts by stabilizing elements of archeological features. Ground disturbance associated with projects that would result in ground disturbance and/or excavation (trail/road improvements, new facility or infrastructure development, restoration) have the potential to result in site-specific, long-term adverse impacts on known or unknown archeological resources, when avoidance is not possible. (NEPA)	<u>Cumulative Impacts</u>  Actions to remove facilities near, or reroute visitors from known archeological sites would result in localized long-term, beneficial impacts by stabilizing elements of archeological features. Ground disturbance associated with projects that would result in ground disturbance and/or excavation (trail/road improvements, new facility or infrastructure development, restoration) have the potential to result in site-specific, long-term adverse impacts on known or unknown archaeological resources, when avoidance is not possible. (NEPA)	<u>Cumulative Impacts</u>  Actions to remove facilities near, or reroute visitors from known archeological sites would result in localized long-term, beneficial impacts by stabilizing elements of archeological features. Ground disturbance associated with projects that would result in ground disturbance and/or excavation (trail/road improvements, new facility or infrastructure development, restoration) have the potential to result in site-specific, long-term adverse impacts on known or unknown archaeological resources, when avoidance is not possible. (NEPA)	<u>Cumulative Impacts</u>  Actions to remove facilities near, or reroute visitors from known archeological sites would result in localized long-term, beneficial impacts by stabilizing elements of archeological features. Ground disturbance associated with projects that would result in ground disturbance and/or excavation (trail/road improvements, new facility or infrastructure development, restoration) have the potential to result in site-specific, long-term adverse impacts on known or unknown archaeological resources, when avoidance is not possible. (NEPA)	<u>Cumulative Impacts</u>  Actions to remove facilities near, or reroute visitors from known archeological sites would result in localized long-term, beneficial impacts by stabilizing elements of archeological features. Ground disturbance associated with projects that would result in ground disturbance and/or excavation (trail/road improvements, new facility or infrastructure development, restoration) have the potential to result in site-specific, long-term adverse impacts on known or unknown archaeological resources, when avoidance is not possible. (NEPA)

Segment 1 – Above Nevada Falls  
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Segment 3 – Merced Gorge

Segment 4 – El Portal  
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Segment 6 – Wawona Impoundment

Segment 7 - Wawona  
Segment 8 – South Fork Merced River

TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
<b>18. American Indian Traditional Cultural Resources</b>					
<u>Segment 1</u> Under this alternative, impacts on traditional cultural resources would be negligible. There would be no planned changes in the treatment of traditional cultural resources. Impacts on these resources would occur as a result of ongoing park operations and programs, such as facilities maintenance and repair, as well as visitor use.	<u>Segment 1</u> These actions may have either a beneficial or adverse impact on traditional cultural resources, particularly areas of traditional plant use. As an example, construction may result in disruption of ethnobotanical species’ habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area. If avoidance is possible, impacts will be negligible, but if avoidance is not possible, impacts may be moderate to major (NEPA).	<u>Segment 1</u> These actions may have either a beneficial or adverse impact on traditional cultural resources, particularly areas of traditional plant use. As an example, construction may result in disruption of ethnobotanical species’ habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area. If avoidance is possible, impacts will be negligible, but if avoidance is not possible, impacts may be moderate to major (NEPA).	<u>Segment 1</u> These actions may have either a beneficial or adverse impact on traditional cultural resources, particularly areas of traditional plant use. As an example, construction may result in disruption of ethnobotanical species’ habitats, and may be an adverse impact, while removal of informal trails may have a beneficial impact on the same plant use area. If avoidance is possible, impacts will be negligible, but if avoidance is not possible, impacts may be moderate to major (NEPA).	<u>Segment 1</u> No ecosystem restoration would occur in Segment 1 under this alternative, and impacts on traditional cultural resources (both beneficial and adverse) would likely be negligible (NEPA).	<u>Segment 1</u> No ecosystem restoration would occur in Segment 1 under this alternative, and impacts on traditional cultural resources (both beneficial and adverse) would likely be negligible (NEPA).
<u>Segment 2</u> Under this alternative, impacts to traditional cultural resources would be adverse, as restoration of ethnobotanical resources would not occur, but also beneficial, as potential for adverse impacts associated with physical disturbance and access to resources during restoration activities would not occur (NEPA).	<u>Segment 2</u> Site specific restoration actions may have long-term, beneficial impacts on meadows, however construction at Yosemite Lodge, Yosemite Village, and Housekeeping camp may result in long term, adverse impacts to ethnohistoric sites at these locations (NEPA).	<u>Segment 2</u> Site specific restoration actions may have long-term, beneficial impacts on meadows, however construction at Yosemite Lodge and Housekeeping camp may result in long term, adverse impacts to ethnohistoric sites at these locations (NEPA)	<u>Segment 2</u> Site specific restoration actions may have long-term, beneficial impacts on meadows, however construction at Yosemite Lodge and Housekeeping camp may result in long term, adverse impacts to ethnohistoric sites at these locations (NEPA)	<u>Segment 2</u> Site specific restoration actions may have long-term, beneficial impacts on meadows, however construction at Yosemite Lodge and Upper Pines may result in long term, adverse impacts to ethnohistoric sites at these locations (NEPA)	<u>Segment 2</u> Site specific restoration actions may have long-term, beneficial impacts on meadows, however construction at Yosemite Lodge and Housekeeping camp may result in long term, adverse impacts to ethnohistoric sites at these locations (NEPA)
<u>Segment 4</u> Under this alternative, impacts to traditional cultural resources would be adverse, as restoration of ethnobotanical resources would not occur, as well as beneficial, as potential for adverse impacts associated with physical disturbance and access to resources during restoration activities would not occur.	<u>Segment 3 &amp; 4</u> Site specific Actions to protect valley oaks would have a long term, beneficial impact on resources, while the construction of employee housing and administrative camping may have a long term, adverse impact (NEPA).	<u>Segment 3 &amp; 4</u> Site specific Actions to protect valley oaks would have a long term, beneficial impact on resources, while the construction of employee housing may have a long term, adverse impact (NEPA).	<u>Segment 3 &amp; 4</u> Site specific Actions to protect valley oaks would have a long term, beneficial impact on resources, while the construction of employee housing may have a long term, adverse impact (NEPA).	<u>Segment 3 &amp; 4</u> Site specific Actions to protect valley oaks would have a long term, beneficial impact on resources, while the construction of employee housing may have a long term, adverse impact (NEPA).	<u>Segment 3 &amp; 4</u> Site specific Actions to protect valley oaks would have a long term, beneficial impact on resources, while the construction of employee housing may have a long term, adverse impact (NEPA).
<u>Segment 5,6,7, &amp; 8</u> Under Alternative 1 no opportunities for limiting access to sensitive areas would occur in Segment 7.	<u>Segment 5,6,7, &amp; 8</u> Relocation and construction actions in the Wawona area have the potential to have a long term, adverse impact on traditional cultural resources (NEPA).	<u>Segment 5,6,7, &amp; 8</u> Relocation and construction actions in the Wawona area have the potential to have a long term, adverse impact on traditional cultural resources (NEPA).	<u>Segment 5,6,7, &amp; 8</u> Relocation and removal of campgrounds in the Wawona area have the potential to have a long term, adverse impact on traditional cultural resources (NEPA).	<u>Segment 5,6,7, &amp; 8</u> Relocation and removal of campgrounds in the Wawona area have the potential to have a long term, adverse impact on traditional cultural resources (NEPA).	<u>Segment 5,6,7, &amp; 8</u> Relocation and removal of campgrounds in the Wawona area have the potential to have a long term, adverse impact on traditional cultural resources (NEPA).

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TABLE 9-259: MERCED WILD AND SCENIC RIVER PLAN ALTERNATIVE SUMMARY COMPARISON TABLE (CONTINUED)

Alternative 1 No Action	Alternative 2 Self-Reliant Visitor Experiences and Extensive Floodplain Restoration	Alternative 3 Dispersed Visitor Experiences and Extensive Riverbank Restoration	Alternative 4 Resource-Based Visitor Experiences and Targeted Riverbank Restoration	Alternative 5 Enhanced Visitor Experience and Essential River Bank Restoration	Alternative 6 Diversified Visitor Experiences and Selective Riverbank Restoration
18. American Indian Traditional Cultural Resources					
<u>Cumulative Impacts</u> Cumulative impacts would be negligible.	<u>Cumulative Impacts</u> The proposed management actions associated with Alternatives 2 may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings.	<u>Cumulative Impacts</u> The proposed management actions associated with Alternatives 3 may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings.	<u>Cumulative Impacts</u> The proposed management actions associated with Alternatives 4 may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings.	<u>Cumulative Impacts</u> The proposed management actions associated with Alternatives 5 may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings.	<u>Cumulative Impacts</u> The proposed management actions associated with Alternatives 6 may have reduced or negligible impacts following consultation, or beneficial impacts resulting from enhanced communities of traditionally used plants, restrictions on some kinds and amounts of visitor use, or protection or enhancement of site settings.

Segment 1 – Above Nevada Falls  
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## 10. CONSULTATION AND COORDINATION

This chapter summarizes the consultation and coordination efforts undertaken for the *Merced River Plan/DEIS*. This National Park Service (NPS) plan was developed in accordance with the National Environmental Policy Act of 1969 (NEPA) and the implementing regulations developed by the Council on Environmental Quality (CEQ), which require diligence in involving any interested or affected members of the public in the planning process (40 CFR 1508.22). Compliance with the National Historic Preservation Act (NHPA) is integrated into the NEPA compliance process, using the NHPA Section 106 review process to coordinate the evaluation of effects on cultural resources.

Throughout this Yosemite National Park planning process, an intensive effort was made to involve professionals from all aspects of river and park management, in consultation with culturally associated American Indian tribes and groups, elected officials, other agency partners, local communities, park visitors, and private citizens, as summarized below.

### PUBLIC INVOLVEMENT HISTORY

The public planning process for the *Merced River Plan/DEIS* has helped the NPS to understand and fully consider the interests of the public. Individuals, other public agencies, culturally associated Indian tribes and groups, organizations, and businesses have identified various issues and opportunities regarding the *Merced River Plan/DEIS* as part of this comprehensive process. This section describes the public involvement process, summarizes the public comments received, and describes how the NPS used these comments to identify significant issues to consider in the plan. In general, the major planning issues that would be resolved by the *Merced River Plan/DEIS* involve: (1) best management strategies for protecting and enhancing river values; (2) visitor use and associated user capacity for the river corridor; and (3) the types, sizes, and suitable locations of facilities and services needed to support visitor use.

### Identification of Planning Issues: Scoping and Public Workshops

Formal internal and public scoping for the *Merced River Plan/DEIS* was conducted in accordance with CEQ regulations related to NEPA and NHPA compliance. The NPS solicited public and agency comments for the plan during a series of public scoping periods and public workshops.

#### *Public Scoping*

The purpose of scoping is to conduct an early and open process to identify issues and concerns related to the planning process and to determine the scope of issues to be addressed in the environmental analysis. Public scoping was conducted in consultation with interested organizations and individuals. The NPS initiated public scoping for the *Merced River Plan/DEIS* after a notice of intent appeared in the *Federal Register* in April 2007 for 60-day period. The public scoping period re-opened in June 2009, after a March 2008 court-issued opinion directed the NPS to expand the scope of the *Merced River Plan/DEIS*. The NPS extended the public scoping period several times and facilitated a series of

workshops and public meetings associated with each public scoping period. **Table 10-1** describes the public scoping comment periods from April 2007 to February 2010. The NPS considered all comments received since 2007 as part of this current planning process.

During the 2007 scoping period, the NPS received 191 public scoping responses (letters, faxes, emails, and comment forms), which included 81 form letters. During the 2009 through 2010 scoping period, the NPS received 576 response letters, which included 112 form letters.

**TABLE 10-1: PUBLIC SCOPING COMMENT PERIODS FOR THE MERCED RIVER PLAN/DEIS**

Initial Public Scoping for the <i>Merced River Plan/DEIS</i> – April 11, 2007
<ul style="list-style-type: none"> <li>• Notice of Intent to prepare an Environmental Impact Statement (EIS) – Published on April 11, 2007, in the <i>Federal Register</i> (Vol.72,(69), page 18272).</li> <li>• Public scoping period – Open for 60 days, to close on June 10, 2007.</li> <li>• Three public meetings during the public scoping period – Mariposa on May 16, 2007; San Francisco on May 17, 2007; and Yosemite Valley on May 30, 2007.</li> <li>• Public response – During the 2007 scoping period, the NPS received 191 public scoping responses (letters, faxes, emails, and comment forms), including 81 form letters.</li> <li>• A summary of the 2007 public comments was posted on Jan. 31, 2011, to the park’s website at <a href="http://www.nps.gov/yose/parkmgmt/mrp_documents.htm">www.nps.gov/yose/parkmgmt/mrp_documents.htm</a>.</li> </ul>
Public Scoping Period Re-opened – June 30, 2009
<ul style="list-style-type: none"> <li>• Notice posted in the <i>Federal Register</i> (Vol. 74 (124), pages 31306-06) on June 30, 2009, announcing the opportunity to provide comments on a revised Merced River Plan, as directed in the March 27, 2008, court-issued opinion to expand the scope of the plan. The notice expressed that “all previous prior scoping comments remain under consideration.”</li> <li>• Public scoping period – Open for 60 days, to close on Aug. 29, 2009</li> <li>• Ten public meetings during the public scoping period – Oakhurst on Oct. 26, 2009; Lee Vining on Oct. 27, 2009; Yosemite Valley on Oct. 28, 2009; Mariposa on Nov. 2, 2009; Fresno on Nov. 3, 2009; Groveland on Nov. 4, 2009; Sacramento on Nov. 9, 2009; Berkley on Nov. 10, 2009; Los Angeles on Nov. 16, 2009, and Dec. 2, 2009</li> <li>• First extension of the public scoping period– On Aug. 25, 2009, a notice was posted in the <i>Federal Register</i> (Vol. 74 (163) pages 42,917-18) announcing the first extension of the public scoping period, for 90 days, through Dec. 4, 2009. The notice stated, “Comments already provided in response to the June 30, 2009, Notice of Intent need not be resubmitted.”</li> <li>• Second extension of the public scoping period – On Nov.16, 2009, the NPS issued press releases announcing a second extension of the public scoping period for 60 days. The NPS accepted scoping comments through Feb. 4, 2010. Subsequently, related public notices appeared in newspapers throughout Northern California and the Yosemite region, including in the <i>Sierra Star</i> (on Nov. 19, 2009) and the <i>Union Democrat</i> (on Nov. 23 and Nov. 30, 2009), which notified the public that the public scoping period had been extended.</li> <li>• On Nov. 17, 2009, the NPS sent an e-newsletter to more than 5,700 recipients stating the public scoping period would be extended through Feb. 4, 2010. Also on Nov. 17, the NPS posted information about the extension of the public scoping period prominently on the park’s website. Shortly thereafter, the NPS sent 25,000 postcards to Yosemite campers informing them of the planning process that was underway and providing them with directions about how to obtain more information on the park’s website. Official notice of this second extension was initiated by the park on Nov. 19, 2009. This notice appeared in the <i>Federal Register</i> on Feb. 4, 2010 (Vol. 15 (23) pages5,083). The notice stated, “Any comments already provided need not be resubmitted,” indicating that comments from 2007 onwards would be considered in this planning effort.</li> <li>• Public response – During the 2009-2010 scoping period, the NPS received 576 public responses (letters, faxes, emails, and comment forms), including 112 form letters.</li> <li>• A summary of the 2009-2010 public comments was posted on Jan. 31, 2011, on the park’s website.</li> </ul>



All public scoping responses were reviewed and analyzed using the NPS' Planning, Environment and Public Comment analysis tools. Each response was carefully read, and individual ideas were assigned a code according to subject matter. A total of 4,458 discrete ideas were identified. These statements technically constitute the formal "public comments." A public scoping comment summary report was prepared by the NPS and posted to the web on Jan. 31, 2011. The *2010 Merced Wild and Scenic River Comprehensive Management Plan Public Comment Summary* and all public comments are available at [www.nps.gov/yose/parkmgmt/mrp\\_documents.htm](http://www.nps.gov/yose/parkmgmt/mrp_documents.htm). This scoping summary was a primary reference used by the planning team to identify significant issues to address and integrate in the range of alternatives.

### ***Public Scoping Workshops***

The NPS held 18 public workshops devoted to scoping for the *Merced River Plan/DEIS* between July 2009 and December 2010. To promote participation, the NPS mailed more than 30,000 postcards to interested parties on the mailing list; these postcards provided a schedule of public scoping meetings and instructions for submitting comments. The NPS advertised public meetings in a variety of ways, including announcements on the park's website and in electronic newsletters and news releases. Fliers were also posted in gateway communities, throughout the park, and on campground bulletin boards. In addition to these meetings, public discussion regarding the *Merced River Plan/DEIS* took place at monthly open houses in Yosemite Valley and at quarterly meetings of Yosemite Gateway Partners.

### ***Internal Scoping***

Internal scoping was conducted with NPS managers and staff, culturally associated American Indian tribes and groups, affected federal and state agencies, and local government entities. An interdisciplinary team, made up of Yosemite staff and subject-matter experts, provided feedback to the planning team to help identify relevant planning issues and opportunities in the Merced Wild and Scenic River corridor. Comments were submitted through various channels, including interdisciplinary meetings, through a division liaison or chief, or through members of the planning team. The NPS interdisciplinary planning team used a rigorous process to fully evaluate and analyze public and internal scoping comments. Several documents guided the team: the public scoping summary report (in conjunction with the full text public comments); the *Merced Wild and Scenic River Values Draft Baseline Conditions Report*; and research studies to identify issues and opportunities to address through the Merced Wild and Scenic River planning process. This information base was augmented using the collective knowledge of subject-matter experts, park managers, and the interdisciplinary planning team.

### ***Other Public Workshops, Outreach Activities, and Forums***

Public workshops are a foundation of the public-involvement process, providing an opportunity for the public, the NPS interdisciplinary planning team, and subject-matter experts to interact. The NPS held more than 40 public workshops devoted to public involvement in the *Merced River Plan/DEIS* between July 2009 and August 2012. The NPS also held additional public forums, including several online webinars and site visits. Each public forum reflected the most current point in the planning process and

allowed the public to give feedback to the planning team. As part of Yosemite's commitment to robust public involvement, transparency and open communication, all public comments received during workshops and through other public outreach efforts are posted routinely to the park website. The public workshops conducted to date are described below and in **Table 10-2**. The NPS will continue to facilitate workshops throughout the development of the *Merced River Plan/Final EIS*, expected in 2013.

**In Summer 2010:** Workshops engaged the public in a foundational aspect of the plan, the analysis and articulation of the outstandingly remarkable values (ORVs) for the Merced Wild and Scenic River. The *Draft 2010 Outstandingly Remarkable Values Report for the Merced Wild and Scenic River* was provided, and public feedback was solicited to help refine the ORV statements and understand their condition.

**In Spring 2011:** The NPS hosted a workshop series dedicated to sharing information about the baseline conditions of the Merced River's ORVs as well as management considerations related to transportation and user capacity. Park staff and consultants gave informational presentations, fielded technical questions, and gathered feedback from members of the public. These workshops were simultaneously broadcast via webinar. After the meetings, recordings were posted to <https://yose.webex.com> where they have been viewed and downloaded more than 300 times since posting.

**In Fall 2011:** The NPS offered an alternatives development workshop series that included a webinar. In addition to the standard means for notifying the public about this public involvement opportunity, the NPS also used social media, such as Facebook and Twitter, to announce meetings and webinars to thousands of people through one post. This workshop series previewed a range of options to address management issues under consideration and to solicit feedback on that range of options. The planning team asked the public to give feedback on how these options might be combined into conceptual management alternatives. The NPS planning team developed a detailed planning workbook for this public outreach phase and distributed more than 700 copies of the *Fall 2011 Merced Wild and Scenic River Planning Workbook*. The workbook was also available for review, comment, and download on Yosemite's website. The NPS received 245 individual public comment letters in response. That feedback was used by the planning team during the development phase of the preliminary alternative concepts.

**In Spring 2012:** The public was invited to comment on the range of preliminary alternative concepts for the Merced Wild and Scenic River Plan. The NPS distributed almost 1,000 copies of the *Merced Wild and Scenic River Preliminary Alternatives Concepts Workbook* during this outreach phase, and a series of five workshops, three site visits, and two webinars were offered. The workbook was available for review, comment, and download on Yosemite's website. The two webinars were also recorded and posted at <https://yose.webex.com>. Webinar recordings have been viewed and downloaded more than 100 times. During public scoping, the public commented on these preliminary alternative concepts. The NPS received 413 public comment letters in response. The NPS examined and synthesized input received through internal and public workshops, site visits, and the administrative and public review of these preliminary alternative concepts to refine the management alternatives analyzed in this *Merced River Plan/DEIS*.

**In Summer 2012:** The NPS offered a public workshop to consult with subject-matter experts and representatives from academic institutions, tribal governments, and local, state, and federal government agencies on protecting and enhancing ORVs and management of user capacity.

**TABLE 10-2: PUBLIC WORKSHOPS CONDUCTED TO DATE**

2009 Summer/Fall/Winter: Public Scoping Workshops
The NPS hosted a series of 18 public workshops during the 2009 public scoping period. These meetings occurred in park, gateway and regional communities, and in major metropolitan areas in California. Locations included Fresno, Oakhurst, Lee Vining, Yosemite Valley, Mariposa, Fresno, Groveland, El Portal, Sacramento, Berkeley, Los Angeles, and Wawona. Presentations on the scope, history, and purpose of the plan were given. Participants were asked questions about what they valued and what they wanted to see protected in the river corridor, and what, if anything, should be changed.
2010 Summer: Outstandingly Remarkable Values (ORVs) Workshops
The NPS hosted a series of seven workshops to engage the public on three main topics: (1) specific locations or features that exemplify river values that the NPS may have missed in its ORV evaluation for the river corridor, (2) observations or knowledge of the conditions that relate to these river values, (3) the best ways to protect and enhance river values. The workshops took place in Wawona, San Ramon, Fresno, Oakhurst, Yosemite Valley, Groveland, and El Portal. Paper copies of the <i>Draft 2010 Outstandingly Remarkable Values Report for the Merced Wild and Scenic River</i> were distributed at the workshops, and electronic versions were posted to Yosemite's website for public review and comment. During this unofficial comment period, the NPS received and reviewed 33 individual public comment letters.
2011 Spring: Baseline Conditions Workshops
The NPS hosted a series of five workshops and a science forum that were simultaneously broadcast by webinar and a science forum. These workshops focused on the conditions of the river's ORVs and management considerations that a successful Merced River Plan would need to address. The workshops also included the topics of transportation and user capacity. The NPS posted the <i>Draft Merced Wild and Scenic River Values Baseline Conditions Report</i> for public review and comment. During this unofficial comment period, the NPS received and reviewed six individual public comment letters.
2011 Fall: Alternatives Development Workshops
This series of five workshops provided an opportunity to solicit early public input on the options the NPS was considering to protect river values or address user capacity or land-use management for the Merced River Plan. The NPS developed a planning workbook to help the public prepare for and participate in the workshops. More than 700 paper copies of the <i>Fall 2011 Merced Wild and Scenic River Planning Workbook</i> were distributed at the workshops, and electronic versions were posted to the park's website for public review and comment. The NPS conducted workshops in Yosemite Valley, El Portal, Wawona, and San Francisco, as well as one online webinar. The park received 245 comment letters in response to the workbook.
2012 Spring: Preliminary Alternatives Concepts Workshops
These workshops, site visits, and webinars presented an initial range of preliminary alternative concepts for consideration by the public, stakeholders, and internal and external partners. The information provided to the public described the process for developing and refining user capacities for the Merced River corridor. A planning workbook was made available to the public on March 19, 2012, with a comment period extending through April 20, 2012. Paper copies of the <i>Merced Wild and Scenic River Preliminary Alternatives Concepts Workbook</i> were distributed at the workshops, and electronic versions were posted to Yosemite's website for public review and comment. During this period, the NPS received 413 public comment letters.
2012 Summer: ORV Workshop
In August 2012, the NPS sponsored a public workshop titled "protection and enhancement of river values" to review the foundational planning materials with the public and foster discussion of user capacity, including a 2011 river-use study, in regard to the Merced River Plan. This 2012 meeting in Yosemite Valley fulfilled the requirement of the 2009 <i>Settlement Agreement</i> to meet with the public between the release of the preliminary alternative concepts and the forthcoming <i>Merced River Plan/DEIS</i> . At the meeting, user capacity subject-matter experts presented "boats, beaches, and river banks: visitor evaluations of recreation on the Merced River in Yosemite Valley" to discuss visitor-use issues with the public audience, made up of consult with individual experts and representatives from academic institutions, tribal governments and local, state, and federal government agencies during the meetings, notes were taken and later uploaded with the full slide presentations on Yosemite's website.

### ***Other Public Outreach Activities and Forums***

In order to ensure that interested and affected parties were meaningfully engaged in the planning process, the NPS developed a robust public involvement program. In addition to the standard outreach activities required by NEPA, the NPS successfully engaged in a variety of public outreach activities and forums.

Distribution of fliers, postcards, and print materials relating to the planning process helped involve members of the public who might not otherwise be aware of the opportunity to become involved in the Merced River Plan. Online webinars allowed people whose schedule or geographic location might preclude them from attending in-person public meetings engage in the planning process. The posting of recorded webinars online also extended the life of the presentation. People who did not know about or were not able to attend the live presentations could still access to information provided at a later time. Use of social media, such as Facebook and Twitter, for outreach was intended to reach a broader public, especially those without a history of involvement in the Merced River Plan. These and other outreach activities and forums helped ensure low-income and minority communities that could be affected by the proposal and alternatives were involved in the planning process.

### **Issues to be Addressed in the ‘Merced River Plan/DEIS’**

Internal and public scoping and workshops identified major issues that a successful *Merced River Plan/DEIS* would address. The NPS identified these issues from formal 2007-2010 public scoping comments; public comments from interim (informal) comment opportunities; the *Draft Merced Wild and Scenic River Values Baseline Conditions Report*; and research studies conducted during the 2010 and 2011 field seasons. This information base was augmented with the collective knowledge of subject-matter experts, park managers, and the interdisciplinary planning team.

Internal and public comments were considered to be significant if they addressed the overall purpose of and need for the plan or identified potential effects within the project area. As such, these issues were identified as those to consider, explore, and integrate in the range of alternatives.

Major issues include:

- Natural resource stewardship and restoration, including protection and enhancement of water quality, free-flowing condition, geologic/hydrologic processes, and biological and scenic values.
- Cultural resource stewardship, including protection and enhancement of archeological and ethnographic resources, as well as careful consideration of historic cultural resources.
- Visitor experience issues, including recreational use of the Merced Lake High Sierra Camp, trailhead quotas, camping, separation of use types, dispersal of visitor uses, floating, rafting, and watercraft use.
- Land-use and facility management issues, including those related to the types and locations of services offered, siting of administrative facilities, infrastructure to support visitor and administrative use, transportation, circulation, and parking.

- User-capacity issues related to the kinds and amounts of visitor and administrative use, tools for managing visitor use and access, indicators and standards of quality, and a monitoring program.

For a detailed table of the major issues to be addressed in the *Merced River Plan/DEIS*, see “Purpose and Need for the Merced River Plan” (Chapter 2).

## TRIBAL/FEDERAL/STATE/LOCAL AGENCY CONSULTATION

### Culturally Associated American Indian Tribes and Groups

The NPS consulted with traditionally associated American Indian tribes and groups throughout the development of the *Merced River Plan/DEIS*. Yosemite National Park currently maintains consultation relationships with seven American Indian tribes and groups that claim traditional cultural association with park lands and resources. This includes five federally recognized American Indian tribes (Bridgeport Paiute Indian Colony of California, Bishop Paiute Tribe, North Fork Rancheria of Mono Indians of California, Picayune Rancheria of the Chukchansi Indians, and the Tuolumne Band of Me-Wuk Indians), and two American Indian groups (American Indian Council of Mariposa County, Inc. [also known as the Southern Sierra Miwuk Nation] and the Mono Lake Kutzadika<sup>a</sup>). Consultation with federally-recognized American Indian tribes takes place on a government-to-government basis.

In December 2009, Yosemite requested tribal participation in the Merced Wild and Scenic River Plan. The NPS formally requested information from culturally associated tribes and groups for the protection of traditional cultural resources and historic properties with traditional cultural or religious significance. Tribal consultation included regularly scheduled and special meetings, as well as tribal site visits. Comments received from traditionally associated American Indian tribes and groups have been considered throughout the planning process. Yosemite officials will continue to consult with culturally associated tribes and groups throughout the EIS implementation process and will work directly with appropriate tribal government officials when plans or activities could have direct or indirect effects on traditional cultural resources, tribal interests, practices, traditional use areas and/or sacred sites. **Table 10-3** outlines tribal consultation meetings for the *Merced River Plan/DEIS* since July 2007.

The Yosemite National Park American Indian Consultation Program facilitates regulatory compliance with the National Historic Preservation Act; the National Environmental Policy Act; the Native American Graves Protection and Repatriation Act; and other statutes, policies, and guidance related to American Indian resources, issues, and concerns. The NPS will continue to conduct formal and informal consultations with traditionally associated American Indian tribes and groups about proposed NPS plans and actions that have the potential to affect the treatment, use, and access to cultural and natural resources with documented or potential cultural meaning for those groups.

**TABLE 10.3: TRIBAL CONSULTATION MEETINGS THROUGH DEC. 1, 2012**

Merced Wild & Scenic River Comprehensive Management Plan/EIS Tribal Consultation Meetings (as of Dec. 1, 2012)			
Date	Meeting	Location	Participants with the NPS
July 2007	Annual All Tribes Meeting	Tuolumne Lodge, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , American Indian Council of Mariposa County (AICMC), Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians
July 2008	Annual All Tribes Meeting	Wawona Hotel Sunroom, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians
July 2009	Annual All Tribes Meeting	Tuolumne Lodge, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians, Bridgeport Indian Colony, North Fork Rancheria of Mono Indians of California
July 2010	Annual All Tribes Meeting	Yosemite Lodge, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians, Bridgeport Indian Colony, North Fork Rancheria of Mono Indians of California
February 2011	Quarterly Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
August 2011	Annual All Tribes Meeting	Wawona Hotel, Yosemite	Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians, North Fork Rancheria of Mono Indians of California
September 2011	Monthly Tribal Council Meeting, AICMC	Mariposa	AICMC Tribal Council
December 2011	Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
January 2012	Monthly Wauhoga Meeting	Mariposa	Wauhoga Committee
February 2012	Monthly Wauhoga Meeting	Mariposa	Wauhoga Committee
March 2012	Quarterly Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
March 2012	Quarterly Consultation Meeting	North Fork Rancheria of Mono Indians of California	North Fork Rancheria of Mono Indians of California Tribal Council
July 13, 2012	Annual All Tribes Meeting	Lee Vining	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of the Chukchansi Indians, Tuolumne Band of Me-Wuk, North Fork Rancheria of Mono Indians of California
July 17, 2013	Tribal Site Visit	Yosemite Valley	AICMC, Tuolumne Band of Me-Wuk Indians
Aug. 14, 2012	Tribal Site Visit	El Portal	AICMC, Tuolumne Band of Me-Wuk Indians
Aug.27, 2012	Quarterly Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
Nov. 7, 2012	Tribal Site Visit	Yosemite Valley	AICMC

## Consultation with Federal Agencies

### *U.S. Army Corps of Engineers*

The Clean Water Act (Public Law 92-500) requires federal land agencies to consult with the U.S. Army Corps of Engineers (Army Corps) regarding wetlands in the vicinity of proposed projects. The NPS is consulting with the Army Corps regarding the *Merced River Plan/DEIS*, wetlands delineation, and permit requirements necessary to implement proposed actions in the plan, in accordance with Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act.

Under Section 404 of the Clean Water Act (33 U.S.C. 1344), permit approval is required for projects that may result in the discharge of dredged or fill material into waters of the United States. This includes all navigable waters, their tributaries, impoundments of these waters, and adjacent wetlands. Examples of Section 404 activities include infrastructure development, road fills, and riprap. Some actions proposed in the *Merced River plan/DEIS* may require permits for the discharge of fill material. The NPS would work with the Army Corps to obtain any required Section 404 permits prior to implementing any such action.

Under Section 10 of the Rivers and Harbors Act (33 U.S.C. 403), permit approval is required for the placement of structures in or over, or work in or over, navigable waters of the United States which affects their course, location, condition or capacity. The U.S. Army Corps of Engineers administers Section 10 permits. The NPS will conduct all projects associated with the *Merced River Plan/DEIS* with all Army Corps permit approvals in place. Review copies of the *Merced River Plan/DEIS* are being provided to the Army Corps as part of the consultation process.

### *NPS Water Resources Division*

Two executive orders—11988 Floodplain Management and 11990 Protection of Wetlands—direct federal agencies to enhance floodplain and wetland values; to avoid development in wetlands and floodplains whenever there is a practicable alternative; and to avoid impacts associated with the occupancy or modification of floodplains or wetlands to the extent possible. The NPS Water Resources Division has engaged in administrative review of the *Merced River Plan/DEIS* to ensure the NPS met all obligations under these executive orders.

### *U.S. Fish and Wildlife Service*

The Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed species or critical habitat. Ongoing consultation with the USFWS has been conducted during preparation of the *Merced River Plan/DEIS*. Review copies of the *Merced River Plan/DEIS* are being provided to the USFWS as part of the consultation process.

The NPS initiated informal consultation with the USFWS on Aug. 11, 2010. Updated special-status species lists were obtained from the USFWS on June 6, 2011, and again on April 27, June 27, and

October 18, 2012. Consultation with the agency will continue throughout the environmental compliance process for the *Merced River Plan/DEIS*, and the NPS will obtain an updated list of federally endangered or threatened species every 90 days through project implementation.

### ***U.S. Geological Survey***

The expertise of the U.S. Geological Survey (USGS) was instrumental in developing a comprehensive study of rock-fall hazard and risk in Yosemite Valley, a research study commissioned to inform this planning effort and guide park management. Information from this study was a key element of land use and facilities analyses and related management decisions. The internationally peer-reviewed *Quantitative Rock-fall Hazard and Risk Assessment for Yosemite Valley, Yosemite National Park, California* report (April 2012) can be found on the park's website at <http://www.nps.gov/yose/naturescience/rockfall.htm>. Review copies of the *Merced River Plan/DEIS* have been provided to the USGS as part of the consultation process.

### ***U.S. Forest Service***

The U. S. Forest Service (USFS) manages the 29 miles of Merced Wild and Scenic River segments from the El Portal Administrative Site boundary to the northwest boundary of the Sierra National Forest under the 1991 U.S.F.S. *South Fork and Merced Wild and Scenic River Implementation Plan*. The USFS has been provided with a review copy of this *Merced River Plan/DEIS*.

### ***U.S. Bureau of Land Management***

The U.S. Bureau of Land Management (BLM) manages the 12 miles of Merced Wild and Scenic River segments from the northwest boundary of the Sierra National Forest to Lake McClure under the 1991 *Merced Wild and Scenic River Management Plan*. The BLM has been provided with a review copy of this *Merced River Plan/DEIS*.

### ***Advisory Council on Historic Preservation***

The Advisory Council on Historic Preservation (ACHP) is an independent federal agency that promotes the preservation, enhancement, and productive use of our nation's historic resources and advises the president and Congress on national historic preservation policy. This agency administers the NHPA's Section 106 review process and works with federal agencies to help improve how they consider historic preservation values in their programs.

The ACHP has issued regulations for the implementation of Section 106, titled "Protection of Historic Properties" (36 CFR 800). Yosemite initiated consultation with ACHP in May 2008 by notifying the agency that the park intended to prepare an Environmental Impact Statement (EIS) to comply with NHPA's Section 106. However, in August 2012, at the request of the California State Historic Preservation Officer (SHPO), this process was amended. In September 2012, the ACHP, SHPO, and other consulting parties were provided with the opportunity to review and comment on draft criteria for the historic resources component of the Cultural ORV. Comments were received via conference



call and in writing and are considered in the development of the historic resources component of the cultural ORV.

Yosemite now intends to comply with Section 106 under the standard four-step consultation process outlined in 36 CFR Part 800. It is Yosemite's intention to continue to use the NEPA process to the extent possible to fulfill the public involvement requirements of both NEPA and Section 106. To comply with Section 106 under this four-step process, the park is working with ACHP, SHPO, and other consulting parties to develop a plan-specific programmatic agreement regarding the implementation of the *Merced River Plan/DEIS*. This programmatic agreement is being developed concurrently with this plan and will be included as an appendix of the final plan. Parties to this agreement, including the ACHP, the State Historic Preservation Officer and the traditionally associated American Indian tribes and groups have been provided with review copies of this *Merced River Plan/DEIS*. Consultation with ACHP will continue throughout the development and implementation of the plan as stipulated in the programmatic agreement.

## Consultation with State Agencies

### *California State Historic Preservation Officer*

The California State Office of Historic Preservation is responsible for administering federal- and state-mandated historic preservation programs to protect California's irreplaceable archaeological and historical resources. Consultation takes place under the direction of the State Historic Preservation Officer, a gubernatorial appointee. The NPS initiated consultation with the State Historic Preservation Office regarding the *Merced River Plan/DEIS* in June 2007. This initial consultation was under the terms of the *1999 Programmatic Agreement among the National Park Service at Yosemite, the California State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP) Regarding Planning, Design, Construction, Operations, and Maintenance, Yosemite National Park, California* (1999 PA), which is an October 1999 programmatic agreement developed in consultation with American Indian tribes and groups having cultural association with Yosemite. The parties involved in this 1999 programmatic agreement have been provided with review copies of this *Merced River Plan/DEIS*.

Yosemite met with the State Historic Preservation Officer on June 13, 2012, to discuss the planning effort, ORVs, and potential properties affected. On July 11, 2012, the SHPO visited the park and select historic properties potentially affected by the plan. The SHPO requested that consultation regarding the *Merced River Plan/DEIS* occur per the standard four-step process (per 36 CFR Part 800). In August 2012, the park agreed that consultation under the standard consultation process outlined in 36 CFR Part 800 would provide a more deliberative vehicle to address the plan's Section 106 compliance. In September 2012, the SHPO and other consulting parties participated in a conference call to discuss draft criteria for the historic resources component of the cultural ORV. Comments submitted by SHPO were considered in the development of the historic resources component of the cultural ORV. To that end, the park is working with these consulting parties to develop a plan-specific programmatic agreement regarding the implementation of the *Merced River Plan/DEIS*. This programmatic agreement is being developed concurrently with this plan and will be included as an appendix of the

final plan. It is the park's intention to continue to use the NEPA process to the extent possible to fulfill the public involvement requirements of both NEPA and Section 106. Consultation with the SHPO will continue throughout plan development and implementation.

### ***State Water Resources Control Board and Central Valley Regional Water Quality Control Boards***

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) are the regulatory boards within California's Environmental Protection Agency that derive their authority from Section 401 of the Clean Water Act and Section 13020 of the California Water Code.

SWRCB allocates rights to the use of surface water and, along with nine regional boards, is charged with protecting surface, ground, and coastal waters throughout the state. The RWQCB issues permits that govern and restrict the amount of pollutants discharged into the ground or surface water, which includes regulating storm water during construction activities.

Under the Clean Water Act's Section 401, every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards, if an activity would result in a discharge to a water body.

Yosemite is under the jurisdiction of regional board 5, Central Valley, and therefore consults with and obtains necessary permits and/or certifications for construction activities from that board. If required, the NPS would file a Notice of Intent to discharge storm water and prepare and implement provisions of a Storm Water Pollution Prevention Plan to control run-off from construction activities.

## **Local Governments**

### ***Gateway Communities***

Local governments, gateway and neighboring communities have been extensively involved throughout the iterative phases of planning and public outreach for the *Merced River Plan/DEIS*. Stakeholders from gateway communities have been invited to public planning workshops, and Yosemite has attended quarterly Yosemite Gateway Partners meetings throughout the planning process. Official representatives from county boards of supervisors and other local government representatives have attended public and internal meetings and workshops related to the plan and have provided comment during various phases of the planning process.

The Yosemite National Park superintendent, planning division chief, project managers, planners, and representatives from the Superintendent's Office of Public Involvement and Outreach also presented updates on the plan at gateway planning commission meetings, boards of supervisors meetings, and meetings of various community organizations interested in the planning effort.

## ***Park Communities***

There are two park communities, El Portal and Wawona, located within the Merced Wild and Scenic River corridor for which the park shares jurisdictional authority with the State of California. The NPS has concurrent civil jurisdiction in Wawona and proprietary jurisdiction in the El Portal Administrative Site.

### **El Portal**

The El Portal Town Planning Advisory Committee is a local government entity established to provide town representation and recommendations in any collaborative planning effort with the NPS for the El Portal Administrative Site. Representatives from the Superintendent's Office and the Planning Division regularly attend El Portal Town Planning Advisory Committee meetings to inform the group about the Merced Wild and Scenic River planning process and to solicit community input on planning milestones.

### **Wawona**

The Wawona Town Planning Advisory Committee acts as an advisory body to the Mariposa County Planning Commission for the purpose of developing a specific plan for the Wawona Community Planning Area and for the purpose of making recommendations for implementation. Representatives from the Superintendent's Office and the Planning Division attend regularly scheduled Wawona Town Planning Advisory Committee meetings to engage this group in the planning process and solicit community feedback. In January 2012, the Wawona Town Area Plan was jointly adopted by the Mariposa County Board of Supervisors and the NPS. This specific plan regulates all of the privately owned land within Section 35, Township 4 South, Range 21 East, Mount Diablo Base and Meridian, much of which is within the Merced Wild and Scenic River corridor.

## **Other Major Organization and Subject-matter Expert Consultation**

### ***Major Organization Consultation***

Informational meetings with stakeholder groups and organizations have been conducted throughout the planning process as part of the park's commitment to a robust public involvement process. A selection of relevant cooperative mechanisms is summarized below.

**Yosemite Area Regional Transportation System:** The NPS has entered into a formal agreement with the Yosemite Area Regional Transportation System (YARTS) Joint Powers Authority. The NPS administers an agreement with YARTS for regional transportation services to and through Yosemite, including services along the Highway 140 / El Portal Road in the Merced River corridor. Representatives of YARTS were included on the project's mailing list, participated in relevant public meetings and were sent hard copies of public review documents.

**National Trust for Historic Preservation:** On Aug. 27, 2012, the NPS agreed to accept the National Trust for Historic Preservation (NTHP) request to serve as a consulting party on the *Merced River Plan/DEIS*. The NTHP were included on the project's mailing list, participated in relevant meetings in June, July, and September 2012 and were sent hard copies of public review documents and notification of public involvement opportunities.

**Historic Bridge Foundation:** On Aug. 23, 2012, the NPS agreed to accept the Historic Bridge Foundation (HBF) request to serve as a consulting party on the *Merced River Plan/DEIS*. HBF has been included on the project's mailing list, participated in the discussion regarding the historic resources component of the Cultural ORV in September 2012 and have been sent hard copies of public review documents, and notification of public involvement opportunities.

### ***Other Subject-matter Expert Consultation***

Pursuant to the *2009 Settlement Agreement*, subject-matter experts in the field of user capacity have been engaged throughout the planning process. These experts were engaged as consultants at the beginning of the planning process in October 2009. Experts worked with park planners to define ORVs; identify planning issues and constraints; analyze the kinds of visitor use in the corridor; develop preliminary alternative concepts; establish user capacities and estimate use levels; and evaluate and finalize capacities and mitigations. These subject-matter experts also engaged in public planning workshops during spring and fall of 2011 and again during spring and summer of 2012.

### **Other Agencies and Individuals Notified**

The NPS sent other notification letters (not listed above) to the following:

#### ***Federal Representatives and Agencies***

- Senator Barbara Boxer, U.S. Senate
- Senator Dianne Feinstein, U.S. Senate
- Representative Jeff Denham, U.S. House of Representatives, 19th District
- U.S. Environmental Protection Agency
- Federal Highway Administration

#### ***State Representatives, Agencies, and Organizations***

- Senator Tom Berryhill, California State Senate
- Representative Kristin Olsen, California State Assembly
- California Air Resources Board
- Caltrans District 10
- Caltrans Planning
- California Department of Conservation
- California Department of Fish and Game Region # 4 (Central)
- California Department of Housing and Community Development
- California Native American Heritage Commission

- California Office of Historic Preservation
- California Regional Water Quality Control Board # 5F (Central Valley)
- California Resources Agency
- California Department of Water Resources
- Sierra Nevada Conservancy

### ***County and Local Agencies and Organizations***

- Eastern Sierra Council of Governments
- Council of Fresno County Governments
- Fresno County Planning Department
- Fresno County Board of Supervisors
- Inyo County Board of Supervisors
- Inyo County Planning Department
- Madera County Board of Supervisors
- Madera County Planning Division
- Mariposa County Board of Supervisors
- Mariposa County Planning Department
- Merced County Planning and Community Development
- Merced County Board of Supervisors
- Mono County Community Development Department, Planning Division
- Mono County Board of Supervisors
- San Joaquin Council of Governments
- San Joaquin County Board of Supervisors
- San Joaquin County Community Development Department
- Stanislaus Council of Governments
- Tuolumne County Board of Supervisors
- Tuolumne County Community Development Department

## **PUBLIC REVIEW OF THE 'MERCED RIVER PLAN/DEIS'**

Copies of the *Merced River Plan/DEIS* are being distributed to those that have requested them, as well as to U.S. congressional delegations, state and local elected officials, federal agencies, traditionally associated American Indian tribes and groups, organizations and local businesses, public libraries, and the news media. Plan information, including the process and timeline for public review and comment, can be obtained on the NPS Planning, Environment and Public Comment (PEPC) at [http://parkplanning.nps.gov/yose\\_mrp](http://parkplanning.nps.gov/yose_mrp) or the Merced River Plan project webpage at [www.nps.gov/yose/parkmgmt/mrp\\_documents.htm](http://www.nps.gov/yose/parkmgmt/mrp_documents.htm). Please refer to these websites for exact comment review close and end dates.

Readers are encouraged to submit comments through NPS Planning, Environment and Public Comment (PEPC) at [http://parkplanning.nps.gov/yose\\_mrp](http://parkplanning.nps.gov/yose_mrp). Alternately, comments can be emailed to [yose\\_planning@nps.gov](mailto:yose_planning@nps.gov) or sent by U.S. mail. Written comments regarding this document should be postmarked by the end of the review period and directed to the mailing address below.

Superintendent, Yosemite National Park  
ATTN: Merced River Plan  
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Yosemite, California 95389  
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## **Agencies, Organizations, and Businesses Receiving the ‘Merced River Plan / DEIS’**

### ***U.S. Government***

#### **Members of Congress**

- Senator Barbara Boxer
- Senator Diane Feinstein
- Representative Jeff Denham, U.S. House of Representatives, 19th District
- Representative (elected) Tom McClintock, U.S. House of Representatives, 4th District

### ***Federal Agencies***

#### **Advisory Council on Historic Preservation**

#### **U.S. Department of Agriculture, Forest Service**

- Inyo National Forest
- Sierra National Forest
- Stanislaus National Forest
- Region 5

#### **U.S. Department of Defense**

- Army Corps of Engineers, Regulatory Board

#### **U.S. Department of Health and Human Services**

- U.S. Public Health Service

#### **U.S. Department of the Interior**

- Bureau of Land Management, Folsom, California, Office
- Bureau of Reclamation, Sacramento Office
- Fish and Wildlife Service, Sacramento Regional Office
- Interagency Wild and Scenic Rivers Coordinating Council
- National Park Service
  - Air Resources Division
  - Conservation Study Institute
  - Denver Service Center
  - Geologic Resources Division

- Office of Legislative and Congressional Affairs
- Pacific West Regional Office
- Washington Office
- Water Resources Division
- Wild and Scenic River Steering Council
- National Parks
  - Sequoia and Kings Canyon National Parks
  - Devils Postpile
  - Inventory & Monitoring (I&M) Sierra Nevada Network
- U.S. Department of the Interior Library
- U.S. Geological Survey
  - USGS Publications Department
  - Water Resources Division, Western Region

#### **U.S. Department of Justice**

#### **U.S. Department of Transportation, Federal Highway Administration, Sacramento**

#### **U.S. Environmental Protection Agency, San Francisco Regional Office**

#### **American Indian Tribes and Groups**

- American Indian Council of Mariposa County, Inc.
- Bishop Paiute Tribe
- Bridgeport Paiute Indian Colony
- Mono Lake Kutzadikaa Tribe
- North Fork Rancheria of Mono Indians of California
- Picayune Rancheria of the Chukchansi Indians
- Tuolumne Band of Me-Wuk Indians

#### ***California State Government***

##### **State Representatives**

- Senator Tom Berryhill, California State Senate
- Representative Kristen Olsen, California State Assembly
- Representative (elected) Frank Bigelow, California State Assembly

##### **State Agencies and Organizations**

- California Air Resources Board
- Caltrans District 10
- Caltrans Planning
- California Department of Conservation
- California Department of Fish and Game Region # 4 (Central)
- California Department of Housing and Community Development
- California Native American Heritage Commission

- California Office of Historic Preservation
- California Regional Water Quality Control Board # 5F (Central Valley)
- California Resources Agency
- California Department of Water Resources
- Sierra Nevada Conservancy

### ***County and Local Governments***

#### **Fresno County**

- Council of Fresno County Governments
- Fresno County City Planning Department
- Fresno County Planning and Resource Management

#### **Tuolumne County**

- Board of Supervisors
- Community and Resources Agency
- Tuolumne County Planning Commission

#### **Inyo County**

- Board of Supervisors
- Planning Department

#### **Madera County**

- Board of Supervisors
- Planning Division

#### **Mariposa County**

- Board of Supervisors
- Planning Department
- El Portal Town Plan Advisory Committee
- Wawona Town Planning Advisory Committee

#### **Merced County**

- Association of Governments
- Board of Supervisors
- Planning Commission
- Planning Department Office

#### **Mono County**

- Board of Supervisors
- Community Development Department, Planning
- Eastern Sierra Council of Governments



### **San Joaquin County**

- San Joaquin County Council of Governments
- Air Pollution Control District
- Community Development Department

### **Stanislaus County**

- Environmental Review Committee
- Planning and Community Government
- Stanislaus Council of Government

### **Tuolumne County**

- Board of Supervisors
- Department of Public Works
- Planning Commission

### **Visitor Bureaus and Visitor Centers**

- Yosemite / Mariposa County Tourism Bureau, Mariposa
- Mariposa County Visitors Center (Chamber of Commerce), Mariposa
- Yosemite Sierra Visitors Bureau, Oakhurst
- Oakhurst Area Chamber of Commerce, Oakhurst
- Bass Lake Chamber of Commerce, Bass Lake
- North Fork Chamber of Commerce, North Fork
- Coarsegold Chamber of Commerce, Coarsegold
- Merced Visitor Services / California Welcome Center, Merced
- Tuolumne County Visitors Bureau, Sonora
- Yosemite Chamber of Commerce, Groveland
- Mono Lake Committee Information Center and Bookstore, Lee Vining
- Mono Basin National Forest Scenic Area Visitor Center, Lee Vining
- Lee Vining Chamber of Commerce, Lee Vining
- Mono County Tourism and Film Commission, Mammoth Lakes
- Mammoth Lakes Welcome Center, Mammoth Lakes
- Bridgeport Chamber of Commerce, Bridgeport
- Northern Mono Chamber of Commerce, Topaz

### ***Organizations and Businesses***

- |                                      |  |
|--------------------------------------|--|
| • Access Fund                        | • California Bicycle Coalition                     |
| • American Alpine Club               | • California Native Plant Society, Sequoia Chapter |
| • American Hiking Society            | • California Preservation Foundation               |
| • American Whitewater                | • California Trout, Sierra Nevada Office           |
| • Ansel Adams Gallery                | • California Wilderness Coalition                  |
| • AT&T                               | • Californians for Western Wilderness              |
| • Backcountry Horsemen of California |  |
| • Bassett Memorial Library           |  |

- Central Sierra Environmental Resource Center
- Cycle California! Magazine
- Earth Island Institute
- David Evans & Associates, Inc.
- Delaware North Corporation
- Earth Island Institute
- Earthjustice Legal Defense Fund
- El Portal Market
- Environment Now
- Environmental Defense Fund
- Foothill Conservancy
- Foothill Resources
- Friends of the Earth
- Friends of the River
- Friends of Yosemite
- High Sierra Hikers Association
- Historic Bridge Foundation
- LSC Transportation Consultants, Inc.
- Mammoth Mountain Resort
- Mariposans for the Environment and Responsible Government
- MIG
- Mountain Light Photography
- National Audubon Society
- National Parks and Conservation Association
- Native Habitats
- Natural Resources Defense Council
- NatureBridge Yosemite
- Northcoast Environmental Center
- National Tour Association
- National Trust for Historic Preservation
- Pacific Legal Foundation
- Planning and Conservation League
- Royal Robbins, Inc.
- Service Employees International Union Local 535
- Sierra Club
- National Office
- Toiyabe Chapter
- Tehipite Chapter
- Earthjustice Legal Defense Fund
- Sierra Foothill Conservancy
- Sierra Railroad Company
- Sierra Telephone
- Southern Yosemite Mountain Guides
- Southern Yosemite Visitor's Bureau
- The Nature Conservancy
- The Redwoods in Yosemite
- The Trust for Public Land
- The Wilderness Society
- Tioga Lodge
- Tuolumne River Trust
- Upper Merced River Watershed Council
- Wawona Area Properties Owners Association
- Wild Wilderness
- Wildlands Center for Preventing Roads
- Wilderness Watch
- Yosemite Area Audubon
- Yosemite Area Regional Transportation System
- Yosemite Conservancy
- Yosemite Bug Hostel
- Yosemite Valley Campers Coalition
- Yosemite Sightseeing Tours
- Yosemite West Community Planning Advisory Committee

## Libraries

- Mariposa County Library, El Portal
- Mariposa County Library, Wawona
- Mariposa County Library
- Fresno County Library
- Madera County Library
- Merced County Library
- Oakhurst
- San Francisco City, Main Branch
- Stanislaus County Library
- Los Angeles City, Central Branch
- Tuolumne County Library, Groveland
- Tuolumne County Library, Sonora
- Yosemite National Park Research Library
- U.S. Department of the Interior Library

## Public Media

The following public media outlets will be sent a copy of the *Merced River Plan/DEIS*:

### Newspapers

- Fresno Bee
- Los Angeles Times
- Mariposa Gazette
- Merced Sun-Star
- Modesto Bee
- Sierra Star
- Sacramento Bee
- San Francisco Chronicle
- Sonoma Union Democrat

### Television Stations

- KCRA NBC 3 - Sacramento
- KGO-TV ABC 7 – San Francisco
- KMPH Fox 26 – Fresno
- KNBC 4 NBC– Burbank / Los Angeles
- KQED 9 Public TV – San Francisco
- KOVR 13 CBS - Sacramento
- KRON 4 MyNetworkTV – San Francisco
- KTVU 2 Cox – Oakland
- KXTV 10 ABC – Sacramento

### Radio Stations

- KCBS AM/FM – San Francisco
- KFBK AM/FM– Sacramento
- KFIV (K-Five) AM – Modesto
- KGO AM – San Francisco
- KMJ AM/FM – Fresno
- KQED FM NPR – San Francisco
- KUHL AM – Santa Maria
- KZSQ FM - Sonoma
- KVML AM - Sonoma
- KKBN FM - Sonoma
- KXJZ FM Capital Public Radio - Sacramento

### Colleges and Universities

- Cooperative Ecosystem Studies Units (CESU) Network
- California State University Fresno
- California State University Sacramento
- California State University Sonoma
- California State University Stanislaus
- Columbia College
- Merced College
- Stanford University
- University of California at Berkeley
- University of California at Davis
- University of California at Los Angeles
- University of California at Merced
- University of California Water Resources Center Archives

Note: Names of individuals receiving the *Merced River Plan/DEIS* are available upon request.

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## 11. LIST OF PREPARERS

Name	Title	Education	Years of Experience
<b>YOSEMITE NATIONAL PARK—EXECUTIVE LEADERSHIP TEAM</b>			
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Name	Title	Education	Years of Experience
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OTHER EIS SUPPORT			
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Gail Slemmer	Writer/editor, NewFields Companies	B.A. Modern Languages	37 Other
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Kathy Anderson	Historian	M.A. Public History B.A. History	6
Lisa Bautista	Document Project Administrator	Business Administration	23
Joshua Boldt	Biologist	B.S. Biology (Botany)	11
Elijah Davidian	Managing Associate	M.S. Natural Resource Policy M. Urban and Regional Planning B.A. Environmental Studies	10
Dylan Duverge	Senior Associate I	M.S. Applied Geosciences B.A. Environmental Studies	6
Robert Eckard	Senior Associate	B.A. Creative Studies Biological Resources; In Process: PhD in Water Quality	10
Erich Fischer	Biological Resources Practice Leader	B.A. Biological Sciences	22
Elizabeth Hill	Associate	B.Landscape Architecture	2
Jack Hutchison	Senior Transportation Engineer	M.Eng. Transportation Engineering B.S. Civil Engineering	34



Name	Title	Education	Years of Experience
ENVIRONMENTAL SCIENCE ASSOCIATES, PRIME CONTRACTOR (Continued)			
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Wes McCullough	Senior GIS Analyst	B.A. Geography	10
Jason Mirise	Senior Acoustics Specialist	M.Eng. Acoustics B.S. Electrical Engineering	17
Alisa Moore	Program Manager	B.S. Biology	19
Matthew Morales	Senior Associate	B.S. Environmental Toxicology	8
Christian Nilsen	Senior Hydrologist	M.S. Environmental Fluid Mechanics and Hydrology B.S. Civil Engineering	11
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LAND ECONOMICS CONSULTANTS, SUBCONTRACTOR			
Steven Spickard	Managing Principal	M. City and Regional Planning B.A. Economics	36
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Tina Stott	Principal	M.A. Urban and Regional Planning B.A. Economics	26

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## 12. GLOSSARY AND ACRONYMS

### GLOSSARY OF TERMS

**100-year floodplain:** The area along the river corridor that would receive floodwaters during a 100-year flood event. A 100-year flood event has the probability of occurring 1% of the time during any given year. If a 100-year flood event occurs, the following year will still have the same probability for occurrence of a 100-year event. For the purposes of this plan, the 100-year floodplain also includes wetlands and meadows associated with the hydrologic and ecological processes of the river.

**1982 Secretarial Guidelines for Wild and Scenic Rivers:** The 1982 Interagency Guidelines on the Wild and Scenic Rivers Act (also referred to as Secretarial Guidelines) provide guidelines on the evaluation, classification, and management of rivers designated as Wild and Scenic within the U.S. Departments of Agriculture and the Interior. The section of the guidelines on management of Wild and Scenic Rivers addresses carrying capacity and public use, as well as development of facilities and other management issues.

**Adaptive management:** A process that allows the development of a plan when some degree of biological and socioeconomic uncertainty exists. It requires a continual learning process, a reiterative evaluation of goals and approaches, and redirection based on increased information and changing public expectations.

**Affected environment:** Existing biological, physical, social, and economic conditions of an area that are subject to change, both directly and indirectly, as a result of a proposed human action.

**Alluvial:** An adjective referring to alluvium, which are sediments deposited by erosional processes, usually by streams.

**Alluvium:** A general term for clay, silt, sand, gravel, or similar unconsolidated rock fragments or particles deposited during comparatively recent geologic time by a stream or other body of running water.

**Alternatives:** Sets of management elements that represent a range of options for how, or whether to proceed with a proposed project. An environmental impact statement analyzes the potential environmental and social impacts of the range of alternatives presented.

**Archeological resources:** Historic and prehistoric deposits, sites, features, structure ruins, and anything of a cultural nature found within, or removed from, an archeological site.

**Area of potential effect:** The geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist. The area of potential effect is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking.

**Bed:** Refers to the relatively flat or level bottom (substrate) of a body of water, as in a lakebed or riverbed.

**Best Management Practices:** Effective, feasible (including technological, economic, and institutional considerations) conservation practices and land- and water-management measures that avoid or minimize adverse impacts to natural and cultural resources. BMPs may include schedules for activities, prohibitions, maintenance guidelines, and other management practices.

**Biodiversity:** Biodiversity, or biological diversity, is generally accepted to include genetic diversity within species, species diversity, and a full range of biological community types. The concept is that a landscape is healthy when it includes stable populations of native species that are well distributed across the landscape.

**Boundaries:** The areas that receive protection under the Wild and Scenic Rivers Act. Boundaries include an average of not more than 320 acres of land per mile, measured from the ordinary high water mark on both sides of the river.

**CEQ Regulations:** The Council on Environmental Quality (CEQ) was established by the National Environmental Policy Act (see NEPA) and given the responsibility for developing federal environmental policy and overseeing the implementation of NEPA by federal agencies.

**Classifications:** The status of rivers or river segments under the Wild and Scenic Rivers Act (“wild,” “scenic,” or “recreational”). Classification is based on the existing level of access and human alteration of the site.

**Comprehensive Management Plan (CMP):** A plan to protect and enhance a Wild and Scenic River. The Merced River Plan is the National Park Service’s comprehensive management plan for segments of the Merced River corridor under its jurisdiction.

**Cultural landscape:** A geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. There are four general types of cultural landscapes, not mutually exclusive: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

**Ecological restoration:** Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.

**Emergent wetland:** A wetland characterized by frequent or continual inundation dominated by herbaceous species of plants typically rooted underwater and emerging into air (e.g., cattails, rushes). The emergent wetland class is characterized by erect, rooted, herbaceous hydrophytes (e.g., cattails, rushes), excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Perennial plants usually dominate these wetlands. All water regimes are included, except sub-tidal and irregularly exposed.

**Environmental consequences:** This section of an environmental assessment describes the impacts a proposed action will have on resources. Direct, indirect, and cumulative impacts, both beneficial and adverse, are analyzed. The context, duration, and intensity of impacts are defined and quantified as much as possible.

**Environmental Impact Statement (EIS):** A public document required under the National Environmental Policy Act (NEPA) that identifies and analyzes activities that might affect the human and natural environment.

**Environmentally Preferable Alternative:** The environmentally preferable alternative is the alternative within the range of alternatives presented in a Draft Environmental Impact Statement (EIS) that best promotes the goals of the National Environmental Policy Act (NEPA). In general, this is the alternative causes the least damage to the environment and best protects natural and cultural resources. In practice, one alternative may be more preferable for some environmental resources while another alternative may be preferable for other resources. (The NEPA Handbook)

**Ecosystem:** An ecosystem can be defined as a geographically identifiable area that encompasses unique physical and biological characteristics. It is the sum of the plant community, animal community, and environment in a particular region or habitat.

**Erratic:** A rock fragment of any size carried by glacial ice, or by floating ice, deposited at some distance from the outcrop of origin.

**Facilities:** Buildings and the associated supporting infrastructure such as roads, trails, and utilities.

**Floodplain:** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

**Fluvial:** Of or pertaining to a river. Fluvial is a technical term used to indicate the presence or interaction of a river or stream within the landform.

**Free-flowing river:** Existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway (as defined in the Wild and Scenic Rivers Act - 16 USC 1286 [b]).

**Glacial till:** Glacially transported and unconsolidated mixtures of clay, silt, sand, and gravel deposited directly by and underneath a glacier without being reworked by melt water.

**Glaciation:** Effects on landforms produced by the presence and movement of a glacier.

**Geomorphic:** Of or pertaining to the form of the Earth or of its surface features.

**Governing mandates:** The National Park Service is directed to address user capacity, resource protection, and public enjoyment of park resources through a number of pieces of legislation such as laws, regulations, policies, and programs referred to in the Merced River Plan as governing mandates. These mandates establish the authority and responsibility for management in Yosemite National Park.

**Groundwater:** All subsurface water (below soil/ground surface), distinct from surface water.

**Groundwater recharge:** The process involved in the absorption and addition of surface water to the zone of saturation or aquifer.

**Hazardous material:** A substance or combination of substances, that, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either: (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, disposed of, or otherwise managed.

**Hazardous waste:** Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, spilled, or contaminated, or that are being stored temporarily prior to proper disposal.

**Headwaters:** The point or area of origin for a river or stream.

**High Sierra Camps:** Overnight lodging facilities operated by the concessioner in the wilderness areas that include tent cabins, food service, and other amenities.

**Historic building:** For the purposes of the National Register of Historic Places, a building can be a house, barn, church, hotel, or similar construction, created principally to shelter human activity. “Building” may also refer to a historically and functionally related unit, such as a courthouse and jail or a house and barn.

**Historic district:** A historic district is an area which possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. To be eligible for the National Register of Historic Places, a district must be significant, as well as being an identifiable entity. It must be important for historical, architectural, archeological, engineering, or cultural values.

**Historic property:** A historic property is any prehistoric or historic building, site, district, structure, or object that is included in, or eligible for inclusion in, the National Register of Historic Places. Types of historic properties can include archeological sites, historic cultural landscapes, and traditional cultural properties.

**Historic site:** A historic site is the location of significant event which can be prehistoric or historic in nature. It can represent activities or buildings (standing, ruined, or vanished). It is the location itself which is of historical interest in a historic site, and it possesses cultural or archeological value regardless of the value of any structures that currently exist on the location. Examples of sites include shipwrecks, battlefields, campsites, natural features, and rock shelters.

**Historic structure:** For the purposes of the National Register of Historic Places, the term “structure” is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter. Examples of structures include bridges, gazebos, and highways.

**Hydrologic response:** The response of a watershed due to precipitation. Usually refers to the resulting streamflow from a precipitation event.

**Implementation plan:** Implementation plans, which tier off of programmatic plans (like the General Management Plan) focus on “how to implement an activity or project needed to achieve a long-term goal. Implementation plans may direct specific projects as well as ongoing management activities or programs. They provide a more extensive level of detail and analysis than do general management plans. Implementation plans are required to undergo NEPA review.

**Implementation project:** Implementation projects are specific actions identified in an implementation plan.

**Impoundment:** A dam or other structure to obstruct the flow of water in a river or stream.

**Lacustrine:** Of or relating to lakes.

**Management zone:** A geographical area for which management directions or prescriptions have been developed to determine what can and cannot occur in terms of resource management, visitor use, access, facilities or development, and park operations.

**Metamorphic rock:** Metamorphic refers to rocks derived from pre-existing rocks by mineralogical, chemical, structural changes.

**Mitigation:** Activities that will avoid, reduce the severity of, or eliminate an adverse environmental impact.

**Native American Graves Protection and Repatriation Act (NAGPRA):** The act that requires federal agencies and institutions that receive federal funding to return Native American cultural items to their respective peoples. This act also establishes a program of federal grants to assist in the repatriation process.

**National Environmental Policy Act (NEPA):** The federal act that requires the development of an environmental impact statement (EIS) for federal actions that might have substantial environmental, social, or other impacts.

**National Historic Landmarks (NHL):** Are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States.

**National Historic Preservation Act (NHPA):** In 1966, Congress established a program for the preservation of additional historic properties through the country. The NHPA requires federal agencies to evaluate the impact of all federally funded or permitted projects on historic properties through the *Section 106* process.

**National Park Service Organic Act:** In 1916, the National Park Service Organic Act established the National Park Service in order to “promote and regulate use of parks” and defined the purpose of the

national parks as “to conserve the scenery and natural and historic objects and wild life therein and to provide for the enjoyment of the same in a manner and by such means as will leave them unimpaired for the enjoyment of future generations.” This law provides overall guidance for the management of Yosemite National Park.

**National Parks and Recreation Act:** The 1978 law that establishes National Parks, Monuments, Recreation Areas and other recreation lands under the jurisdiction of the Department of the Interior. This law continues to be amended as new lands are acquired or boundaries of existing lands are changed.

**National Register of Historic Places:** As a result of the NHPA of 1966, the National Park Service’s National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources.

**Natural processes:** All processes such as hydrologic, geologic, ecosystem that are not the result of human manipulation.

**No-Action Alternative:** The alternative in a plan that proposes to continue current management direction. “No action” means the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward.

**Nonattainment Area:** A geographical area identified by the U.S. Environmental Protection Agency and/or the California Air Resources Board as not meeting national and/or California ambient air quality standards (NAAQS / CAAQS) for a given pollutant. **Nonnative species:** Species of plants or wildlife that are not native to a particular area and often interfere with natural biological systems.

**Nonwilderness:** Areas that have not been designated for special protection under the Wilderness Act.

**National Park Service Management Policies:** A policy is a guiding principle or procedure that sets the framework and provides direction for management decisions. National Park Service (NPS) policies are guided by and consistent with the Constitution, public laws, Executive proclamations and orders, and regulations and directives from higher authorities. Policies translate these sources of guidance into cohesive directions. Policy direction may be general or specific. It may prescribe the process by which decisions are made, how an action is to be accomplished, or the results to be achieved. The primary source of National Park Service policy is the publication Management Policies 2001. The policies contained therein are applicable Service-wide. They reflect National Park Service management philosophy. Director’s Orders supplement and may amend Management Policies. Unwritten or informal “policy” and people’s various understandings of National Park Service traditional practices are never relied on as official policy.

**Outstandingly Remarkable Values (ORVs):** Those resources in the corridor of a Wild and Scenic River that are of special value and warrant protection. ORVs are the “scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, that shall be protected for the benefit and enjoyment of present and future generations” (16 USC 1272).



**Overnight capacity:** Refers to the actual number of visitors who can be accommodated each night in lodging, camping, and wilderness High Sierra Camp facilities within Yosemite National Park. Capacity is determined by counting the maximum number of people permitted in each campsite and/or the room occupancy within lodging units.

**Palustrine:** The palustrine system was developed to group the vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the United States. It also includes the small, shallow, permanent, or intermittent waterbodies often called ponds. Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers. The Palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 hectares (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2 meters at low water; and (4) salinity due to ocean-derived salts less than 0.5%.

**Particulate matter (PM-10 and PM-2.5):** Fractions of particulate matter characterized by particles with diameters of 10 microns or less (PM-10) or 2.5 microns or less (PM-2.5). Such particles can be inhaled into the air passages and the lungs and can cause adverse health effects. High levels of PM-2.5 are also associated with regional haze and visibility impairment.

**Planning:** A dynamic, interdisciplinary, process for developing short- and long-term goals for visitor experience, resource conditions and facility placement.

**Pluton:** A general term applied to any body of intrusive igneous rock that originates deep in the earth. Named for Pluto, Greek god of the underworld.

**Potential wilderness additions:** Areas in wilderness where an existing use precluded full designation under the California Wilderness Act.

**Preferred Alternative:** The preferred alternative is the alternative within the range of alternatives presented in a Draft Environmental Impact Statement (EIS) that the agency believes would best fulfill the purpose and need of the proposed action. While the preferred alternative is a different concept from the environmentally preferable alternative, they may also be one and the same for some EISs. (The NEPA Handbook)

**Pristine:** Unaltered, unpolluted by humans.

**Programmatic plan:** Programmatic plans establish broad management direction for Yosemite National Park. The 1980 General Management Plan is a programmatic plan with a purpose to set a “clearly defined direction for resource preservation and visitor use” and provide general directions and policies to guide planning and management in the park. The Merced River Plan is also a programmatic plan that guides future activities in the Merced River corridor. Programmatic plans are required to undergo NEPA review.

**Public comment process:** The public comment process is a formalized process required by the National Environmental Policy Act (NEPA) in which the National Park Service must publish a Notice Of Availability in the Federal Register which provides public notice that a Draft Environmental Impact Statement (EIS) and associated information, including scoping comments and supporting documentation, is available for public review and input pursuant to the Freedom Of Information Act. In addition, the National Park Service must conduct formal public hearings on the Draft EIS when required by statute or the Council on Environmental Quality NEPA Regulations.

**Public scoping process:** Scoping is a formalized process used by the National Park Service to gather the public's and other agencies' ideas and concerns on a proposed action or project. A Notice Of Intent (NOI) is published in the Federal Register announcing the agency's intent to prepare an Environmental Impact Statement and a request for written public/other agency scoping comments to further define the goals and data needs for the project. In addition, although not required by the National Environmental Policy Act (NEPA) nor the Council on Environmental Quality (CEQ) NEPA Regulations, public scoping meetings may be held and integrated with any other early planning meetings relating to the proposed project.

**Record of Decision:** The public document describing the decision made on selecting the "preferred alternative" in an environmental impact statement. See "environmental impact statement."

**Riffle (riffle/pool):** A riffle is part of the natural sequence of a stream pattern as it alters between riffles and pools in the linear direction. Riffles are the steeper, shallower areas where turbulence is usually present due to shallow water flowing over the channel substrate. Pools are the calmer, less steep areas where deeper water is present, typically in a wider channel width. Additionally, there are glides that are linear stream areas where no turbulence is present due to sufficiently deep water but stream velocities are higher than typical of pool areas. Glides are usually not as wide across the stream channel as compared to pools.

**Riparian areas:** The land area and associated vegetation bordering a stream or river.

**Riprap:** A layer of large, durable fragments of broken rocks specially selected and graded, thrown together irregularly or fitted together to prevent erosion by waves or currents.

**Riverine:** Of or relating to a river. A riverine system includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5%. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.

**River corridor:** The area within the boundaries of a wild and scenic river (e.g., the Merced River corridor).

**Section 7 determination process:** Section 7 of the Wild and Scenic Rivers Act specifies restrictions on hydro and water resources development projects. Water resources projects are subject to Section 7 of the Wild Scenic Rivers Act (16 USC 1278). Section 7(a) states, "no department or agency of the United

States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.”

**Sediment:** A particle of soil or rock that was dislodged, entrained, and deposited by surface runoff or a stream. The particle can range in size from microscopic to cobble stones.

**Segment:** Section 2 of the Wild and Scenic Rivers Act requires that the Merced River be classified and administered as “wild”, “scenic”, or “recreational” river segments, based on the condition of the river corridor at the time of boundary designation. The classification of a river segment indicates the level of development on the shorelines, the level of development in the watershed, and the accessibility by road or trail. “Wild” segments are free of impoundments and generally inaccessible except by trail, with watersheds and/or shorelines essentially primitive and unpolluted; “Scenic” segments are free of impoundments, with watersheds and shorelines largely undeveloped, but accessible in places by roads; and, “Recreational” segments are readily accessible by road or railroad, may have some development along the shorelines, and may have undergone impoundment or diversion in the past. There are no segments classified as ‘recreational’ in the Merced River corridor.

**Site hardening:** Any development that creates an impervious ground surface. Usually used as a way to direct visitor use and reduce impacts to resources.

**Social trails:** A social trail is an informal, nondesignated trail between two locations. Social trails often result in trampling stresses to sensitive vegetation types.

**Special Status Species:** Species of plants and animals that receive special protection under state and/or federal laws. Also referred to as “listed species” or “endangered species.”

**Subalpine:** Designating or growing in mountain regions just below the timberline.

**Superintendent’s Compendium:** Under the authority of 16 U.S.C., Section 3, and Title 36 Code of Federal Regulations, Chapter 1, Parts 1-7; the Compendium of Superintendent’s Orders was established for Yosemite National Park, referred to as the “Superintendent’s Compendium” in the Revised Merced River Plan/SEIS. Each park superintendent has discretionary authority to regulate or limit certain uses, and/or require permits for specific activities within the boundaries of a national park. (See II-9 for text version of definition)

**Traditional cultural resource:** Any site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.

**Traditional cultural property:** Traditional cultural resource that is eligible for or listed on the National Register of Historic Places as a historic property.

**Treatment:** Work carried out to achieve a historic preservation goal. The four primary treatments are preservation, rehabilitation, restoration, and reconstruction (as stated in the Secretary of the Interior’s Standards for the Treatment of Historic Properties).

**User capacity:** As it applies to parks, user capacity is the type and level of use that can be accommodated while sustaining the desired resource and social conditions based on the purpose and objectives of a park unit.

**User:** Visitors and employees in the Merced River corridor.

**Visitor experience:** The perceptions, feelings, and reactions a park visitor has in relationship with the surrounding environment.

**Visitor use:** Refers to the types of recreation activities visitors participate in, numbers of people in an area, their behavior, the timing of use, and distribution of use within a given area.

**Visitor use levels:** Refers to the quantity or amount of use a specific area receives, or the amount of parkwide visitation on a daily, monthly or annual basis.

**Walk-in campground:** A campground with consolidated parking areas separated from the individual campsites. Campers walk a short distance from the parking area to their campsites.

**Watershed:** The region drained by, or contributing water to, a stream, lake, or other body of water. Synonym: basin or drainage basin.

**Wetland:** Wetlands are defined by the U.S. Army Corps of Engineers (CFR, Section 328.3[b], 1986) as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

**Wild and Scenic River:** A river receiving special protection under the Wild and Scenic Rivers Act.

**Wilderness:** Designated wilderness areas are protected by the provisions of the 1964 Wilderness Act; they are characterized by a lack of human interference in natural processes.

**Wilderness Act of 1964:** The Wilderness Act restricts development and activities to maintain certain places where wilderness conditions predominate.

**Wilderness Impact Monitoring System (WIMS):** Wilderness monitoring is an integral part of Yosemite's wilderness management program. Visitor use patterns have been tracked since 1975 from wilderness permits and field reports by rangers. Monitoring of campsite and trail impacts began in the 1970s. A program now called the Wilderness Impact Monitoring System (WIMS) monitors and evaluates campsite conditions in the wilderness that ensure that the trailhead quotas and wilderness education about proper backcountry care are adequately protecting wilderness values. Using WIMS, visitor satisfaction information, patrol data, and a variety of other studies, the National Park Service conducts wilderness-wide inventory and monitoring. Data gathered from these studies are used to determine when, where, and why significant change occurs, to adjust management practices as appropriate to eliminate unacceptable impacts, and to provide a system for tracking those changes.

**Wilderness Trailhead Quota System:** The Wilderness Trailhead Quota System was established in the 1970s to protect wilderness areas within Yosemite National Park. This system assigns a daily quota for each wilderness trailhead in the park. The quotas are based on scientific studies that evaluated ecological condition and historic use patterns. Controlling use at the trailhead allows for maximum visitor freedom--considered a cornerstone in wilderness experience--while allowing the park to limit or disperse use as appropriate. The Wilderness Trailhead Quota System allows for a total of 1,280 overnight visitors to enter the wilderness each day. Day use in Wilderness is not currently limited or controlled.

## ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADA	The Americans with Disabilities Act
AIRFA	American Indian Religious Freedom Act
ARPA	Archaeological Resources Protection Act
CAAQS	California Ambient Air Quality Standards
CARB	California Environmental Protection Agency, Air Resources Board
CCC	Civilian Conservation Corps
CDFG	California Department of Fish and Game
CDN	Communications Data Network
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMP	Comprehensive Management Plan
DCS	Distributed control subsystem
dB	Decibel
dBA	Decibel (on the "A-weighted" scale)
DNC	Delaware North Companies Parks and Resorts at Yosemite, Inc.
DO	Director's Order
EA	Environmental assessment
EIS	Environmental impact statement
EPA	U.S. Environmental Protection Agency
FEIS	Final environmental impact statement
FONSI	Finding of No Significant Impact
GIS	Geographic information system(s)
GMP	General Management Plan
gpd	Gallons per day
gpm	Gallons per minute
IWSRCC	Interagency Wild and Scenic Rivers Coordinating Council
kWh	Kilowatt hour
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act

## GLOSSARY AND ACRONYMS

NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NPS	National Park Service
NWI	National Wetlands Inventory
ORV	Outstandingly Remarkable Value
PEPC	Planning, Environment, and Public Comment
PG&E	Pacific Gas and Electric
PM	Particulate matter
RWQCB	Regional Water Quality Control Board
RV	Recreational Vehicle
SHPO	State Historic Preservation Officer
SNEP	Sierra Nevada Ecosystem Project
UFAS	Uniform Federal Accessibility Standards
USACE	U.S. Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WIMS	Wilderness Impact Monitoring System
YARTS	Yosemite Area Regional Transportation System
YCC	Youth Conservation Corps
YTS	Yosemite Transit System

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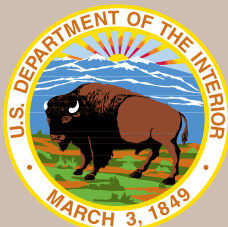
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## Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement Appendices





**Yosemite National Park**

National Park Service  
U.S. Department of the Interior



# **Merced Wild and Scenic River Draft Comprehensive Management Plan and Environmental Impact Statement**

**Appendices**

**January 2013**

**APPENDIX A**

**ACTIONS THAT AMEND THE  
GENERAL MANAGEMENT PLAN**

## APPENDIX A

### SPECIFIC AMENDMENTS TO THE 1980 YOSEMITE GENERAL MANAGEMENT PLAN RESULTING FROM THE MERCED RIVER PLAN

The Wild and Scenic Rivers Act requires river managing agencies to prepare comprehensive management plans for each Wild and Scenic river. The Act generally provides that river management plans “shall be coordinated with and may be incorporated into resource management planning for affected adjacent Federal lands” (16 USC 1274).

In the case of the Merced Wild and Scenic River Comprehensive Management Plan (Merced River Plan), it will revise portions of the National Park Service’s 1980 *General Management Plan* for Yosemite National Park. The Merced River Plan provides direction for the management of the 81 miles of the Merced Wild and Scenic River under the jurisdiction of the NPS. No development or park use of lands in the river corridor shall be permitted that is inconsistent with the Wild and Scenic Rivers Act designation of the Merced River, with this plan, or with the *General Management Plan*.

Alternative 5 is identified as the Preferred Alternative. If this alternative is ultimately selected for implementation, it would result in the following revisions and amendments to the General Management Plan.

- The Merced River Plan’s river corridor boundaries, segment classifications, ORVs and corresponding management objectives revise the *General Management Plan* by establishing more detailed land-use prescriptions that must be applied in future site-specific planning.
- The Merced River Plan’s Section 7 determination process (as called for in the Wild and Scenic Rivers Act) is a tool that augments the goals of the *General Management Plan* by establishing specific guidelines for determining appropriate actions within the bed and banks of the Merced River that do not constitute a direct and adverse effect on the river’s free-flowing condition, water quality, or other values.
- The Merced River Plan’s specific programs, including user capacity, ecological restoration, and ongoing monitoring revise and augment the previous broad direction provided in the *General Management Plan*.
- The management actions and site planning presented in Alternative 5 for Yosemite Valley, El Portal, and Wawona would revise previous site planning actions proposed in the *General Management Plan*.

Please refer to Table A-2 for a complete list amendments to specific actions of the *General Management Plan* that would result from the Merced River Plan.



## MANAGEMENT GOALS

The *General Management Plan* establishes five broad goals for managing Yosemite National Park (NPS 1980: 1-4):

- Reclaim priceless natural beauty
- Allow natural processes to prevail
- Promote visitor understanding and enjoyment
- Markedly reduce traffic congestion
- Reduce crowding

The Wild and Scenic Rivers Act requires comprehensive planning of designated rivers to provide for the protection of the river's free-flowing character and the values that make it worthy of designation. It directs that the plan shall address "resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act."

While the focus of this river management plan is on the Merced River as a unit of the national wild and scenic rivers system, the plan also provides long-term, comprehensive guidance for protecting the values of the Merced River that support its inclusion in the national park system and the national wilderness preservation.

The Merced River Plan was developed to be in keeping with the five broad goals of the *General Management Plan*, *however its overarching goals are to be in keeping with the mandates of the Wild and Scenic Rivers Act*. Namely, these are to preserve designated rivers in their free-flowing condition and to protect and enhance the river's ORVs. The goals of the *General Management Plan* and those of the Merced River Plan are intertwined; no one goal can be emphasized to the complete exclusion of the others.

## PURPOSE OF THE WILD AND SCENIC RIVER

The *General Management Plan* sets forth the purposes of the park and the important resources and values that guide resource management, visitor use, and park operations (NPS 1980: 5-10). The Merced River Plan establishes what the Wild and Scenic Rivers Act calls, "outstandingly remarkable values" for the river. These are the unique, rare, and exemplary characteristics of the river that make it stand apart from all other rivers in the nation. These ORVs, along with water quality and the river's free-flowing condition, are central to the overarching purpose of wild and scenic river management: to protect and enhance these values while allowing public enjoyment, education, and recreation now and in the future.

The Merced River Plan augments the park's *General Management Plan* by further articulating these important river-related values for the Merced Wild and Scenic River.

## MANAGEMENT OBJECTIVES

The *General Management Plan* sets forth a number of Management Objectives that guide resource management, visitor use, and park operations (NPS 1980: 5-10). The Merced River Plan amends the *General Management Plan* by providing additional detailed guidance to park managers on how to achieve management objectives for the Merced River corridor.

The Merced River Plans' management elements include boundaries, classifications, ORVs, Section 7 determination process, a user capacity program, an ecological restoration program, an ongoing monitoring program, management actions needed to protect and enhance river values, and actions to address facilities and land use. Taken together, these elements further guide resource management, visitor use, and park operations within the Merced River corridor.

Projects within the river corridor must protect and enhance ORVs and be consistent with the other elements of the Merced River Plan. There may be occasions when two or more river values may be in conflict with one another. For example, the protection and enhancement of free-flowing condition may not be compatible with the protection of historic structures identified as ORVs that are located in the bed and banks of the river. When conflicts such as these arise, the managing agency must determine appropriate trade-offs to best manage the river system as a whole. Projects adjacent to the river corridor must protect ORVs, and depending on location, may need to undergo a Section 7 review if they affect the bed or banks of the river.

As a result of the above, the following is to be inserted on page 5 of the 1980 *General Management Plan*, after the first paragraph under "Management Objectives:"

The management objectives for the Merced River corridor focus on protecting and enhancing river values. These objectives are presented first in Chapter 5 of the Merced River Plan and summarized in Table A-1 of this document to demonstrate how they correspond to management objectives set forth in the 1980 *General Management Plan*.

## LAND MANAGEMENT ZONING

The 1980 *General Management Plan* divided the park into several zones based on management objectives, significance of the resources, and legislative constraints. The zoning plan described the land use policies that management would work to achieve over the life span of the plan.

Much of the Merced River corridor exists within what are referred to as *natural zones* (including Wilderness Subzone, Environmental Protection Subzone, Outstanding Natural Feature subzone, Natural Environment Subzone, etc.). The Merced River Plan establishes boundaries and classifications for the river in accordance with the Wild and Scenic Rivers Act. While no additional zoning was established as a management tool in this plan, the management guidance provided in this Merced River Plan would remain consistent with the guidance established in these zones.

**TABLE A-1: MANAGEMENT OBJECTIVES FOR FREE FLOW, WATER QUALITY, AND OUTSTANDINGLY REMARKABLE VALUES**

River Value		General Management Plan Management Objectives	Merced River Plan Management Objectives
FREE-FLOWING CHARACTER (All Segments)		Restore altered ecosystems as nearly as possible to conditions they would be in today had natural ecological processes not been disturbed	Reduce the overall amount of human-constructed modifications within the bed and banks of the Merced River through restoration, redesign and other appropriate methods.
WATER QUALITY (All Segments)		Limit unnatural sources of air, noise, visual and water pollution to the greatest degree possible.	Maintain exceptional water quality on all segments of the Merced River within Yosemite National Park and El Portal Administrative Area.
BIOLOGICAL VALUES	ORV 1. Numerous small meadows and riparian habitat IN (Segments 1 and 5)	Restore and maintain natural terrestrial, aquatic, and atmospheric ecosystems so they may operate essentially unimpaired	Manage human use in meadows and riparian habitat within the Merced River corridor to maintain high ecological condition; minimize habitat fragmentation; and protect the integrity of streambanks to conserve ecosystem processes associated with meadow and riparian function.
	ORV2. Meadows and riparian communities of Yosemite Valley (Segment 2)	See above (ORV 1)	The NPS would manage public use of meadows and riparian zones within the Merced River corridor to minimize habitat fragmentation, maintain high ecological condition, and protect the integrity of streambanks to conserve ecosystem processes associated with meadow hydrologic and ecological function.
	ORV 3. Sierra sweet bay (Segments 7 and 8)	Protect threatened and endangered plant and animal species and reintroduce, where practical, those species eliminated from natural ecosystems	Manage the Sierra sweet bay population to protect the abundance of the population along the South Fork Merced River
GEOLOGIC/HYDROLOGIC VALUES	ORV 4. Upper Merced River canyon (Segment 1)	See above (ORV 1)	Manage to allow natural processes to shape the landscape and associated geologic values.
	ORV 5. The "Giant Staircase " (Segment 2)	See above (ORV 1)	Manage to allow natural processes to shape the landscape and associated geologic values.
	ORV 6. Mid-elevation alluvial river (Segment 2)	See above (ORV 1)	Protect and enhance natural geologic and hydrologic processes, such as overbank flooding and channel migration, which sustain river values such as meadow and riparian communities.
	ORV 7. El Portal Boulder Bar	See above (ORV 1)	Manage to allow natural processes to shape the landscape and associated geologic values.

**TABLE A-1: MANAGEMENT OBJECTIVES FOR FREE FLOW, WATER QUALITY, AND OUTSTANDINGLY REMARKABLE VALUES**

River Value		General Management Plan Management Objectives	Merced River Plan Management Objectives
CULTURAL VALUES	ORV 8. Yosemite Valley ethnographic resources (Segment 2)	Preserve, protect, or restore significant cultural resources (historic and prehistoric) Identify, evaluate and determine the significance of cultural resources encompassing buildings, structures, sites and objects Provide for the preservation, restoration, or protection of these significant cultural resources Permit only those uses that are compatible with the preservation of significant cultural resources.	Maintain ethnographic resources, and encourage future propagation to meet cultural restoration purposes to the extent ecologically feasible. Support access for traditional practitioners and other traditionally associated American Indians through the administrative elements of the user capacity and non-recreational tribal pass programs, and ongoing consultation with traditionally associated tribal groups to ensure the success of these programs.
	ORV 9. Yosemite Valley Archeological District (Segment 2)	See above (ORV 8)	Ensure protection and enhancement of the Yosemite Valley Archeological District as a whole, and ensure that human impacts are not adversely affecting the district's essential character and integrity.
	ORV 10. Yosemite Valley Historic Resources	See above (ORV 8)	The Yosemite Valley Historic Resources ORV will be managed to ensure protection and enhancement of this historic development system and its setting. Protection and enhancement entails ensuring that human activities do not adversely affect (per WSRA) the collective ORV or the landscape characteristics of the Yosemite Valley Historic District, within the river corridor, described above. While individual elements of the collective ORV may be lost, the collective of elements will continue to represent the important historic patterns of development in Yosemite Valley, and reflect the important landscape characteristics of the Yosemite Valley Historic District.
	ORV 11. El Portal Archeological District (Segment 4)	See above (ORV 8)	Archeological sites within the El Portal Archeological District would be monitored to ensure protection and enhancement of the district as a whole, and to ensure that human impacts are not adversely affecting the district's essential character and integrity.
	ORV 12. Rock Ring Features (Segment 5)	See above (ORV 8)	Prehistoric archeological sites with rock rings along the South Fork of the Merced River above Wawona will be monitored to ensure that human impacts do not adversely affect the essential character and integrity of the sites.
	ORV 13. Wawona Archeological District (Segments 5-8)	See above (ORV 8)	Archeological sites within the Wawona Archeological District would be monitored to ensure protection and enhancement of the district as a whole, and to ensure that human impacts are not adversely affecting the district's essential character and integrity.
	ORV 14. Wawona Historic Resources	See above (ORV 8)	These structures will be managed to ensure the protection and enhancement of their historical integrity. Protection and enhancement will ensure that management actions, including managing for visitor uses, do not adversely impact the ORV.

**TABLE A-1: MANAGEMENT OBJECTIVES FOR FREE FLOW, WATER QUALITY, AND OUTSTANDINGLY REMARKABLE VALUES**

River Value		General Management Plan Management Objectives	Merced River Plan Management Objectives
SCENIC VALUES	Scenic Value ORV 15. Montaine lakes, pristine meadows, slickrock cascades, and High Sierra peaks (Segment 1)	Identify the major scenic resources and the places from which they are viewed  Provide for the preservation or protection of existing scenic resources and viewing stations  Provide for historic views through vista clearing  Permit only those levels and types of use that are compatible with the preservation or protection of the scenic resources and with the quality of the viewing experience	The NPS will focus efforts primarily on development in the river corridor. While visitor density or encounter rates can affect one's ability to appreciate scenery, visitor use is more appropriately addressed by the Recreation ORV. Similarly, bare soils and river bank erosion can affect foreground views, but are better addressed by the Biological ORV. This high country segment is also susceptible to regional air quality impacts, so the NPS will participate in regional efforts to reduce air pollution. Human activity contributes only to highly localized air quality problems. The NPS would maintain the visitors' ability to experience and appreciate the Scenic ORV by providing a river corridor that is relatively free of development.
	ORV 16. Iconic scenery of Yosemite Valley (Segment 2)	See above (ORV 15)	Segment 2 is the most highly accessible portion of the Merced River, visited by the greatest numbers of park visitors. Here the NPS provides the highest levels of service and accommodations for visitor use, and here the NPS has the greatest obligation to manage visual resources and visitors, and to protect and enhance the conditions that provide for the best possible viewing experiences. The NPS will remove unnecessary facilities from the river corridor and ensure that all future development satisfies objectives that provide low contrast ratings under the VRM system analysis: form, line, color and texture. A Sense of Place: Design Guidelines for Yosemite Valley (NPS 2004) established architectural and site design guidelines that are intended to promote harmony between the built and natural environments.
	ORV 17. Continuous cascade under Sierra outcrops and domes (Segment 3)	See above (ORV 15)	Segment 3 is classified as a scenic reach of the river, fully accessible by El Portal Road, and will be managed to promote visitor enjoyment from the river, from roadside pullouts, and from the roadway itself. Any further development is precluded.
	ORV 18. Vast scenic beauty (segments 5 and 8)	See above (ORV 15)	The NPS will maintain primitive conditions in Wilderness areas adjacent to the river, within the river corridor and beyond. The NPS will continue to manage visitor use through the Wilderness permit system, and to manage vegetation through prescribed fire and controlled burning practices when necessary and appropriate.

**TABLE A-1: MANAGEMENT OBJECTIVES FOR FREE FLOW, WATER QUALITY, AND OUTSTANDINGLY REMARKABLE VALUES**

River Value		General Management Plan Management Objectives	Merced River Plan Management Objectives
RECREATIONAL VALUES	ORV 19. Wilderness-oriented recreation (Segment 1)	<p>Assist all people in understanding, enjoying, and contributing to the preservation of the natural, cultural, and scenic resources</p> <p>Provide only for those types and levels of programs and activities that enhance visitor understanding and enjoyment of park resources</p>	Provide for high quality river-related recreational opportunities oriented toward Wilderness values of unconfined, self-reliant and solitude experiences in a setting that is consistent with the Wilderness character of the area.
	ORV 20. Yosemite Valley recreation (Segment 2)	<p>Assist all people in understanding, enjoying, and contributing to the preservation of the natural, cultural, and scenic resources</p> <p>Provide only for those types and levels of programs and activities that enhance visitor understanding and enjoyment of park resources</p> <p>Permit only those levels and types of accommodations and services necessary for visitor use and enjoyment of Yosemite</p> <p>Provide transportation services that facilitate visitor circulation and enhance preservation and enjoyment of park resources</p>	Provide for a diversity of high quality river-related recreational opportunities that allow visitors to directly connect with the river and its environs amidst the spectacular scenery of Yosemite Valley.

## POLICIES AND PROGRAMS

The 1980 *General Management Plan* established a visitor carrying capacity that was based on the capacity of facilities and infrastructure in the park at that time (NPS 1980: 15-19). The plan recommended changes to the kinds and levels of development to fulfill and support the plan's objectives.

Understanding of visitor uses and capacities has expanded and changed since the *General Management Plan* was published; similarly, the Wild and Scenic Rivers system has also expanded to include the Merced, South Fork Merced, and Tuolumne Rivers in Yosemite. Litigation on the Merced Wild and Scenic River Comprehensive Management Plan resulted in additional directives regarding the establishment of "specific numerical limits" as part of the Wild and Scenic Rivers Act mandate to address user capacity.

For these reasons, the visitor use limits and rationale proposed in the 1980 *General Management Plan* have been revised. Alternative 5 from the Merced River Plan proposes a user capacity program that establishes the kinds and amounts of visitor use that can be permitted while protecting and enhancing river values in the Merced River corridor, including a maximum number of people. This includes specific measurable limits on day and overnight use levels for each river segment. The Merced River Plan also establishes a program of indicators and standards to assess the condition of river values over time to ensure that these limits and management programs continue to be protective of all river values (see Chapter 6).

This new user capacity program will guide each new planning effort undertaken in the Merced River corridor and will therefore amend the *General Management Plan* for areas within the Merced corridor as regards user capacity. The following specific sections are added to page 15 of the 1980 *General Management Plan*:

- The first paragraph under "Park Policies and Programs" shall have this addition:

*Parkwide policies and programs with respect to visitor use, Indian cultural programs, park operations and visitor protection described in this section have been amended by the Merced River Plan for all areas within the Merced River corridor.*

- The first paragraph under "Visitor Use" shall have this addition:

*The sections below that address appropriate activities, visitor use levels, visitor facilities and services, overnight accommodations, concessions, regional cooperation, transportation, interpretation, and provisions for special populations will be guided by the management elements of the Merced River Plan. Visitor use levels and activities are further guided by, and must comply with, the management elements of the Merced River Plan. In the event of a conflict between Parkwide Policies and Programs in the General Management Plan and specific elements of the Merced River Plan, the Merced River Plan will control.*

- The first paragraph under "Visitor Use Levels" shall have this addition:

*The section below that addresses visitor use levels, visitor facilities and services, overnight accommodations, and transportation for the Merced River corridor in Yosemite Valley, El Portal, and Wawona is amended by the Merced River Plan. Specifically, General*

Management Plan *visitor use levels for Yosemite Valley, El Portal, and Wawona are no longer in effect. These visitor use levels are superseded by the user capacity management program in the Merced Wild and Scenic River Comprehensive Management Plan.*

- The table on page 17 under “Visitor Use Levels” shall have these additions:

**TABLE A-2: USER CAPACITY AMENDMENTS TO THE GMP FOR SEGMENT 2**

	GMP	Current management or “No action”	Alternative 5: Enhanced experiences and essential riverbank restoration
<b>Visitor overnight capacity</b>			
Camping	~3,301	2,892	4,032
Lodging	~4,410	3,672	3,697
<b>Total</b>	<b>7,711</b>	<b>6,564</b>	<b>7,729</b>
<b>Visitor day-use capacity</b>			
Day parking	~3,685	7,260	7,549
Regional transit	~6,845	293	684
Tour buses		720	720
<b>Total</b>	<b>10,530</b>	<b>8,272</b>	<b>8,954</b>
<b>Administrative capacity</b>			
Employee housing	480	1,315	1,136
Employee day parking	Not Specified	332	332
<b>Total</b>	<b>480</b>	<b>1,647</b>	<b>1,468</b>
<b>TOTAL SEGMENT CAPACITY</b>	<b>~18,721</b>	<b>16,483</b>	<b>18,151</b>

**TABLE A-3: USER CAPACITY AMENDMENTS TO THE GMP FOR SEGMENT 3**

	GMP	Current management or “No action”	Alternative 5: Enhanced experiences and essential riverbank restoration
<b>Visitor overnight capacity</b>			
People at one time at parking areas	Not Specified	470	470
People at one time on roadway	Not Specified	399	399
<b>Total</b>	<b>Not Specified</b>	<b>869</b>	<b>869</b>
<b>Administrative capacity</b>			
Employee housing	0	9	9
Administrative day parking	Not Specified	4	4
<b>Total</b>	<b>Not Specified</b>	<b>13</b>	<b>13</b>
<b>TOTAL SEGMENT CAPACITY</b>	<b>Not Specified</b>	<b>882</b>	<b>882</b>



**TABLE A-4: USER CAPACITY AMENDMENTS TO GMP FOR SEGMENT 4**

	GMP	Current management or "No action"	Alternative 5: Enhanced experiences and essential riverbank restoration
<b>Visitor day-use capacity</b>			
People at one time at parking areas	~392	740	740
<b>Administrative capacity</b>			
People in residential housing	680	192	288
Administrative staff PAOT	Not Specified	1,220	1,220
<b>TOTAL SEGMENT CAPACITY</b>	<b>~1,072</b>	<b>2,152</b>	<b>2,248</b>

**TABLE A-5: USER CAPACITY AMENDMENTS TO GMP FOR SEGMENTS 6 AND 7**

	GMP	Current management or "No action"	Alternative 5: Enhanced experiences and essential riverbank restoration
<b>Visitor overnight capacity</b>			
Wawona Hotel	~345	247	247
Wawona Campgrounds	~1,980	618	540
<b>Visitor day-use capacity</b>			
Day parking	Not Specified	911	911
Regional transit	Not Specified	0	311
Tour buses	Not Specified	384	384
<b>Administrative capacity</b>			
Employee housing	410	121	121
Administrative day use	Not Specified	60	60
<b>TOTAL SEGMENT CAPACITY</b>	<b>~2,735</b>	<b>2,368</b>	<b>2,574</b>

## DEVELOPED AREA PLANS

The *General Management Plan* contained Developed Area Plans for the Yosemite Valley, El Portal and Wawona within the Merced River corridor (NPS 1980: 62-65). Future plans for Yosemite Valley, El Portal and Wawona must comply with the management elements of the Merced River Plan (boundaries, classifications, Outstandingly Remarkable Values and their protection, Section 7 determination process, user capacity program, restoration program, monitoring program, and management actions). Therefore, the development concepts presented in the *General Management Plan* have been amended by Alternative 5 of the Merced River Plan.

The Merced River Plan will provide guidance for any future development or redevelopment activities within the Merced River corridor, including the development concepts as described in the 1980 *General Management Plan*. While some of the *General Management Plan*'s site planning goals are compatible with those established in the Merced River Plan, the range of site planning alternatives for the Merced River Plan has been developed with particular focus on the protection of river values. To the extent that any development concept presented in the *General Management Plan* would not comply with the elements of the Merced River Plan, that development concept is superseded by the Merced River Plan. Therefore the specific actions called for in the Yosemite Valley, El Portal, and Wawona sections of the *General Management Plan* are replaced by those management actions called for in the Merced River Plan, which has ensured that all actions protect and enhance river values. Actions adjacent to the river corridor but outside of the river boundary must also protect the Merced River's established Outstandingly Remarkable Values.

For this reason, the following paragraph is to be inserted into the *General Management Plan* on page 32:

*Future plans for the Yosemite Village, Yosemite Lodge, Curry Village, the Ahwahnee, Yosemite Valley Campgrounds, Other Valley Areas, Cascades, Arch Rock, El Portal, and Wawona must comply with the management elements of the Merced River Plan (river boundaries, river classifications, Outstandingly Remarkable Values, Section 7 determination process, user capacity management program, ecological restoration program, monitoring program, and management actions). To the extent that any development concepts presented in the General Management Plan do not comply with the elements of the Merced River Plan, that development concept would be superseded by the Merced River Plan. Actions adjacent to the river corridor but outside of the river boundary must also protect the Merced River's established Outstandingly Remarkable Values.*

A more detailed list of the specific actions that would be amended by the Merced River Plan is included in Table A-7.

## **Wilderness**

The *General Management Plan* was published four years before the Yosemite Wilderness was designated in 1984. Although the area encompassed by Segments 1 and 5 were not designated as wilderness at the time the *General Management Plan* was written, backcountry management objectives were established, along with zones, capacities, and visitor use management strategies.

The Merced River Plan would continue to steward the wild segments of the river in accordance with provisions of the Wilderness Act and overarching goals for backcountry management as articulated in the *General Management Plan*. Furthermore, 1,900 acres within Little Yosemite Valley would continue to be managed as wilderness as indicated in the *General Management Plan*. An upcoming Wilderness Stewardship Plan will provide further guidance on wilderness activities in the river corridor.

**TABLE A-6: USER CAPACITY AMENDMENTS TO THE GMP FOR SEGMENTS 1 AND 5**

	GMP	Current management or "No action"	Alternative 5: Enhanced experiences and essential riverbank restoration
<b>Visitor overnight capacity</b>			
Wilderness zone user capacities			
LYV Zone	Not Specified	150	150
Merced Lake Zone	Not Specified	50	50
Washburn Lake Zone	Not Specified	100	100
Mount Lyell Zone	Not Specified	10	10
Clark Range Zone	Not Specified	10	10
South Fork Zone	Not Specified	15	15
Johnson Creek	Not Specified	5	5
Chilnualna Creek	Not Specified	0	0
Merced Lake HSC	Not Specified	60	42
<b>Total</b>	Not Specified	<b>400</b>	<b>382</b>
<b>Visitor day-use capacity</b>			
Half Dome "pass through" use	Not Specified	300	300
Other day use	Not Specified	50	50
<b>Total</b>	Not Specified	<b>350</b>	<b>350</b>
<b>Administrative capacity</b>			
Employee housing	Not Specified	15	15
Administrative day patrols	Not Specified	10	10
<b>Total</b>	Not Specified	<b>25</b>	<b>25</b>
<b>TOTAL SEGMENT CAPACITY</b>	Not Specified	<b>775</b>	<b>757</b>

The Merced River Plan would revise and augment management of commercial use throughout the river corridor consistent with the Extent Necessary Determination (Appendix L).

Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>ALL SEGMENTS: Visitor Use</b>			
Picnicking	Provide additional opportunities for picnicking in Yosemite Valley		<p><b>Lower River:</b> Add 8 picnic tables.</p> <p><b>Swinging Bridge:</b> Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high water mark.</p> <p><b>Sentinel Beach:</b> Redesign the picnic area in its current location to accommodate picnicking.</p> <p><b>Cathedral Beach:</b> Direct use to more resilient areas. Remove parking in the riparian zone, decompact soils, plant appropriate vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain.</p>
<b>SEGMENT 1: Merced Lake High Sierra Camp</b>			
Lodging		56 tent cabins at 5 locations	Retain the Merced Lake High Sierra Camp, reducing the capacity to 11 units (42 beds). Replace the flush toilets with composting toilet.
<b>SEGMENT 2: Yosemite Valley Transportation</b>			
Valley Shuttle	New bus service at El Portal, Crane Flat and Wawona	Improve operation, expand service	Expand shuttle system to West Valley and Wawona Construct shuttle bus stops at Camp 4 and El Capitan Meadow
Regional Transit	Integration with regional transportation systems		Expanded regional public transit.: new service between Fresno and Yosemite Valley
Transportation System	Traffic controls at Pohono and El Capitan crossovers to restrict access when daily limits are reached		Transportation fees at entrance stations and East Yosemite Valley day-use parking permit system for peak season
Private Vehicles	Private vehicles ultimately excluded from Yosemite Valley		No ultimate exclusion of private vehicles
<b>SEGMENT 2: Employee Housing</b>			
Yosemite Valley Concessioner Employee Housing	450 Concessioner Employee Housing Beds		972 concessioner beds in Yosemite Valley; temporary housing with 439 beds removed; permanent housing with 318 beds replaced in Yosemite Valley.

Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>SEGMENT 2: Employee Housing (cont.)</b>			
Tecoya Dorms and Ahwahnee Row	Retain 34 homes at Upper Tecoya Remove 22 Ahwahnee Row residences		Housing and development between Village Store and Ahwahnee Meadow remain.
Yosemite Lodge	Remove 48 tent cabins Retain dormitory housing for 200 concessioner employees		Remove old and temporary housing at Highland Court and the Thousands Cabins. Construct two new concessioner housing areas housing 104 employees (26 in each structure/double occupancy). Construct 78 employee parking spaces.
Curry Village	Remove 75 tent cabins/ Retain 75 tent cabins to accommodate 150 employees		Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.
Concessioner Stables	Not Specified		Retain associated housing (25 beds).
<b>SEGMENT 2: East Yosemite Valley Campgrounds</b>			
Showers		Add concessioner-operated showers at major campgrounds	Not mentioned.
Yosemite Valley Campgrounds	Remove campsites and other development adjacent to the river		Remove all campsites within 100' buffer of the ordinary high-water mark. Restore 6.5 acres of riparian habitat. Designate river access point at North Pines campground.
Backpacker's Campground	Not mentioned		26 sites total (15 removed, 16 added)
Upper Pines	240 sites (18 removed)		238 campsites Remove 2 sites for cultural resource concerns. Add 36 RV sites Add 51 walk-in sites including 2 group sites.
Lower Pines	173 sites (22 removed)		71 sites (5 removed from 100' buffer)
North Pines	86 sites (25 removed)		72 sites (14 removed from 100' buffer)
Upper River Campground	109 sites (15 removed)		32 sites
Lower River Campground	102 sites (36 removed)		40 walk-in sites
Muir Tree and Sunnyside (Camp 4) Walk-In Campgrounds	58 sites		Muir Tree not mentioned. 70 walk-in sites (add 35 sites)
Group Campground (Yellow Pines?)	14 sites		4 group sites (up to 120 people).

Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>SEGMENT 2: Ahwahnee Hotel Area</b>			
Lodging		123	Same
Restaurant, Bar, Sweet Shop, Gift Shop		Dining room with 360 seats inside, 65 seats outside Retain bar, sweet shop, and gift shop	Same
Golf Course and Tennis Courts		Golf course and tennis courts removed	Same
Hotel Services		Typical deluxe hotel services: doorman, bell service, room service, concierge, etc.	Remove pool.
Parking	132 spaces		231 spaces (formalize and add 50 spaces)
<b>SEGMENT 2: Yosemite Village Area</b>			
Village Store		Grocery, deli, photo service (close 4-hour developing), recycling redemption center, transportation kiosk, gift shop and Village Grill (20 inside seats); remove beauty shop, uniform center, enlarge restrooms	Village Store and Grill retained Village Sport Shop repurposed as visitor contact center
Concessioner Garage		Remove Valley Garage from Yosemite Valley	Remove Concessioner Garage building, relocate limited functions to Government Utility Building
Bank		Remove sales office; move ATM/check cashing to another location; adapt use for art activity center	Repurpose the Village Sport Shop to public use and remove the Arts and Activities Center (Bank Building).
Concessioner General Offices	Retain Concessioner Headquarters Building	Remove building, relocate functions	Building is removed from river corridor. Essential functions infilled into the mezzanine of the existing Concessioner Maintenance and Warehouse Building behind Valley Visitor Center
NPS Headquarters	Relocate NPS headquarters to El Portal		Not mentioned
Concessioner Fire Station		Remove existing building, construct new fire station	Not mentioned

Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>SEGMENT 2: Yosemite Village Area (cont.)</b>			
Housekeeping	Remove 68 units (34 buildings) and retain 232 units	Retain small camp store Retain shower and coin-operated laundry	Remove 34 lodging units and redesign out of the ordinary high water mark. Retain a total of 232 lodging units. Remove the grocery store.
<b>SEGMENT 2: Yosemite Lodge</b>			
Lodging		Retain 440 units (Subject to minor design-related adjustments.)	Retain 245 units
Restaurant, Bar, Store, Gift Shop		Retain with approximately 640 seats inside, 40 outside; remodel within existing service area Design smaller bar elsewhere in restaurant complex Retain gift shop; remove clothing sales, use space for information, interpretation	Not mentioned
Bike Stand		Move to site near bike trail	Remove bike rental
Swimming Pool and Snack Stand			Remove swimming pool and snack stand
Service station		Redesign 27 mini-service pumps	Not mentioned
Post Office	Remove post office		Same
Residence 1	Remove Residence 1, Garage, and access road		Relocate Residence 1 (the Superintendent's House) to the NPS housing area and rehabilitate the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (2012).
<b>SEGMENT 2: Curry Village</b>			
Total Lodging Units		420 (subject to minor design-related adjustments )	453
Stoneman House		18	18
Cabin Rooms		252	145
Cabins without baths		0	0
Tent Cabins		150	290

Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>SEGMENT 2: Curry Village (cont.)</b>			
Food Service, Bar, Merchandise		Redesign food service and fast-food units; approximately 370 seats inside; Relocate bar away from picnic setting; Redesign Meadow Deck building for combined mountaineering center and sports shop, enlarge grocery store, add deli, separate gift shop	Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, and swimming pool.
Ice Rink, Bike, Ski, and Raft Rental		Retain and redesign ice rink Provide bike rental at ice rink Redesign Meadow Deck building with space allocated for cross country ski rental Retain raft rental near ice rink	Remove the Happy Isles snack stand and Curry Village ice rink.
Happy Isles Snack Stand		Retain seasonal operation	Remove Happy Isles Snack Stand
Ice Rink Parking	Remove 25 spaces		
Curry Dump Parking	Remove 160 spaces		
Shoulder parking at east end of tent cabin area	Remove 10 spaces		
Curry Orchard	Remove 200 spaces		430 spaces
<b>SEGMENT 2: Concessioner Stables</b>			
Concessioner Stables		Move stables from river bottom to old Curry dump sites	Retain Concessioner Stables in Yosemite Valley in its current configuration. Kennel service remains. Eliminate commercial day horseback rides from Yosemite Valley. Retain associated housing (25 beds).
Commercial Horseback Rides		Retain services including various rides in Yosemite Valley, to valley rim areas and overnight, limit valley routes, require interpretation, discontinue pony rides	Eliminate commercial day horseback rides from Yosemite Valley.
Kennel		Retain at stables	Same



Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>SEGMENT 2: West Valley</b>			
Former Bridalveil Sewage Treatment Plant	Remove sewage treatment plant and ponds near Bridalveil Meadow and restore area		Same
<b>SEGMENTS 3-4: Gorge and El Portal</b>			
Arch Rock Residences	Remove 2 residences		Not mentioned
Visitor Services	Provide information/reservation station and develop a community museum at the Bagby station		Not mentioned
Commercial Facilities	Provide automobile service, restaurants, grocery store, clothing and gift sales, bank, beauty and barber shop		Not mentioned
Remote Parking	150 spaces (Greenmeyer Sandpit)		200 spaces (Abbieville/El Portal Trailer Village)
Other Facilities and Services	NPS Administration Building		Not mentioned
	Concessioner Administrative Building		Not mentioned
	NPS and concessioner maintenance, warehousing, laundry and bus service		Not mentioned
	NPS and concessioner open storage		Not mentioned
	Residential amenities including community recreation and services, open space and landscaping, utilities, meeting hall, fire station, post office, and law enforcement facilities		Not mentioned
<b>SEGMENTS 3-4: Employee Housing</b>			
NPS Employees	70 permanent and 80 seasonal		Not mentioned
Concessioner Employees	390 permanent, 60 seasonal		84 beds in Rancheria Flat 12 beds constructed in Old El Portal

Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>SEGMENTS 3-4: Employee Housing (cont.)</b>			
Other Employees	Permanent and seasonal housing for other employees (about 80)		Not mentioned
<b>SEGMENT 5-8: Wawona</b>			
Wawona Hotel Lodging		104	Same
Wawona Hotel Commercial Services	Retain golf course, stables, tennis court and swimming pool	Redesign store and gift shop to historic scene Retain dining room bar service Retain hotel dining room, golf shop snack bar, add small restaurant outside hotel complex: approximately 170 seats inside, 50 outside	Retain golf course, tennis court, restaurant, and swimming pool. The stables operation and day rides are retained.
Wawona Hotel Parking	Remove parking from in front of the hotel complex and construct a 145-car area north of complex. Provide 50 day use parking spaces adjacent to Wawona Hotel complex		Not mentioned
Chilnualna Trailhead Parking	Provide trailhead parking (50 spaces) at Chilnualna Falls trailhead		Not mentioned
Pioneer History Center Parking	Redesign parking area so users are not required to cross traffic		Not mentioned
Wawona Campground	100 sites 30-person group camp; Relocate campground amphitheater		83 sites Remove 13 sites that are either within 100 feet of the river or in culturally sensitive areas.
Wawona Stock Campground	Retain 25-horse campground		2 sites relocated to area near the Wawona Maintenance Yard.
Section 35 Camping	Construct 200-site campground in Section 35		Not mentioned
Picnicking	Provide additional picnicking and parking areas as needed		Increase the number of picnic benches to accommodate more picnicking near the store.

Facility/Service/Activity	GMP	CSP	Amendment to GMP/CSP
<b>SEGMENT 5-8: Wawona (cont.)</b>			
Transportation	Provide winter bus service to Badger Pass and year-round bus service to Yosemite Valley		Expand shuttle system to West Valley and Wawona
<b>SEGMENTS 5-8: Employee Housing</b>			
Wawona Employee Housing	410		121

# **APPENDIX B**

## **CUMULATIVE ACTIONS**

## **APPENDIX B**

### **CUMULATIVE ACTIONS**

The Council on Environmental Quality (CEQ) describes a cumulative impact as follows (Regulation 1508.7):

A “Cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The cumulative projects addressed in this analysis include past and present actions, as well as any planning or development activity currently being implemented or planned for implementation in the reasonably foreseeable future. Cumulative actions are evaluated in conjunction with the impacts of an alternative to determine if they have any additive impacts on a particular resource. The following are considered in the analysis of cumulative impact projects for this project.

#### **PAST**

##### **Ahwahnee Fire and Life Safety Improvements Project**

The Fire and Life-Safety Improvements Project for The Ahwahnee involved the installation of automatic fire sprinklers, fire/smoke detectors, and fire alarm systems throughout the National Historic Landmark building. The installation of the fire and life-safety equipment affected every room of the building and involved varying amounts of disruption to the historic finishes. Once the installation was completed, all disrupted finishes were restored with in-kind repairs and finishes. Improvements to fire-safe the 2nd floor corridor and to widen the existing exterior south stair from the 2nd floor to ground level were completed to meet code.

##### **Cascades Diversion Dam Removal**

The Cascades Diversion Dam was located on the main stem of the Merced River at the far west end of Yosemite Valley. The dam was a timber “crib” structure with associated concrete abutments. Removing the dam was part of the overall intent of the Merced River Plan and Yosemite Valley Plan to restore free-flowing conditions to the Merced Wild and Scenic River. In its deteriorated condition, the dam presented a significant public health and safety hazard due to the potential for uncontrolled collapse. Removal of this structure and related facilities was completed in 2004.

##### **Cascades Housing Removal**

The Cascades area houses became cost prohibitive to maintain because of substandard construction and inadequate site development (drainage) and non-compliance to construction codes. The houses

contained asbestos and lead paint concerns; abatement costs would have been prohibitive. Removal of these structures was deemed compatible with park values, and the General Management Plan targeted these structures for removal. While the houses were nominated for the Historic Register, they were approved for removal. The removal included the complete removal of structures and foundations, while significant historical components were saved. Five housing units were removed and area vegetation was restored. The project was completed in 2004.

### **Cook's Meadow Ecological Restoration**

This project is restoring a dynamic and diverse wetland ecosystem. The Cook's Meadow restoration project involves the following actions:

- Filling four drainage ditches created by early Euro-American settlers
- Removing a raised, abandoned roadbed and a trail that bisected the meadow
- Reconstructing the trail on an elevated boardwalk that now allows water to flow freely and reduces foot traffic on sensitive meadow plants
- Installing culverts under Sentinel Road to direct runoff into the meadow and restore the natural flow of water from the Merced River during seasonal periods of high water
- Reducing non-native plant species encroaching on native species by using manual, mechanical, and chemical control methods. This project was completed at the end of 2005, and ongoing monitoring will continue.

### **Curry Village Employee Housing**

This project includes the design and construction of new employee housing and related facilities to accommodate approximately 217 concessionaire employees in the area west of Curry Village in Yosemite Valley. This housing will replace concessionaire housing lost in the January 1997 flood. The employee housing units have been designed in accordance with the character of the area, with particular focus on the Curry Village Historic District. The scope of this housing project includes providing parking and access, an employee wellness center, concessionaire housing, management offices, maintenance facilities, postal facilities, and housing related storage. The compliance for this project was completed in 2004, and construction was completed in 2007.

### **Curry Village Huff House Temporary Housing**

This temporary solution was developed in consultation with litigants as part of a settlement agreement concerning the Merced Wild and Scenic River Comprehensive Management Plan. This action provided temporary lodging for 102 employees, and was needed to help meet immediate short-term housing needs for the park concessioner until permanent employee housing is available. The Huff House housing area includes the historic Huff House, and is located within the Yosemite Valley Historic District and the Camp Curry Historic District cultural landscape. This project installed 51 temporary, portable kiosk-like hard-sided cabins without baths (WOBs) and/or canvas tent cabins, and 2 modular shared facilities at infill and peripheral locations at the existing Huff House temporary

employee housing area at Curry Village in Yosemite Valley. The 21 temporary structures placed in infill locations were tent cabins salvaged from the closed areas of Curry Village. Installation of 30 additional temporary tent cabins or WOBs along the northern edge of the Huff House housing area, plus installation of the two shared modular facilities, and relocation of one WOB to an infill location were also accomplished under this project. This project was completed in fall 2009.

### **Curry Village Registration Building, Guest Lounge and Amphitheater Rehabilitation**

This project included the rehabilitation of the Curry Village registration, lounge, and amphitheater structures. The lounge project included the complete rehabilitation of the building's architectural, structural, mechanical, and electrical systems. Included in the project were repairs and improvements to the outdoor amphitheater on the south end of the lounge building. The registration building project included the complete rehabilitation of the building's architectural, structural, mechanical, and electrical systems. All rehabilitation work was constructed in compliance with the Secretary of the Interior's Standards for Rehabilitation.

This project corrected the structural deficiencies of these buildings by rehabilitating building foundations and roof trusses to meet current loads. The project provided an adequate HVAC system, electrical wiring that meets the current National Electric Code, and a fire alarm and suppression system for each building. The building's exteriors were restored, including siding, windows, doors and all building trim to a level where cyclic maintenance can be performed without significant restoration. Federal accessibility standards were incorporated into the project.

### **Curry Village Temporary Guest Showerhouse**

This project installed a temporary guest shower house in the Curry Village area to help offset the loss of guest bathroom facilities resulting from rockfall events that occurred fall 2008. The guest shower house consists of two 40' modular units which house men's, women's, and two accessible shower and restroom services. The two modular buildings are connected by a shared pitched roof over an 8' wide center breezeway which allows access to the facilities in inclement weather with minimal snow removal needed. The building in its entirety is approximately 40' long, 32' wide and 15' tall at the center roof line. This project includes the installation of a covered accessibility compliant ramp at the western side of the structure, and stairs at the eastern side of the building. Additionally, this project proposed to improve the adjacent paved pathway for improved accessibility from the Curry Village parking area. This project was completed in summer 2009.

### **El Portal Road Improvement Project**

Significant damage occurred during the 1997 flood, necessitating an almost complete reconstruction of the El Portal Road. Since then, the NPS has rebuilt the westernmost 6.5 miles of the road — referred to as Segments A, B, and C — but prior to completion, reconstruction of the final one-mile segment of the project, referred to as Segment D, was halted as a result of a successful legal challenge. The court

decision directed the NPS to prepare a comprehensive management plan for the Merced Wild and Scenic River before completing road repairs.

**Completion:** A Finding of No Significant Impact (FONSI) was signed by the Regional Director in July, 2007. Actions were completed in 2008.

### **Fern Springs Restoration**

Ecological restoration, split rail fencing, and an interpretive wayside exhibit comprised Phases 1 and 2 of this project. Actions were completed in 2007.

### **2004 Fire Management Plan/EIS**

This plan guides a complex fire management program, including wildland fire suppression, wildland fire used to achieve natural and cultural resource benefits, fire prevention, prescribed fire, fire ecology research, and the use of mechanical methods to reduce and thin vegetation in and around communities. The plan calls for the use of prescribed fire and passive fuel reduction techniques to achieve protection and ecosystem restoration goals. More aggressive treatment strategies are prescribed in developed areas, if needed. Managed wildland fires (lightning-ignited fires) are allowed to burn where practicable, if specific conditions are present.

### **Happy Isles Dam Removal**

The Happy Isles Dam impoundment was located at the eastern end of Yosemite Valley, had been abandoned since the mid-1980s. The remaining infrastructure consisted of a low rock and concrete dam, two steel-reinforced concrete and iron diversion gates, numerous pipes above and below ground near the dam, and an 8-foot by 12-foot granite powerhouse foundation. The dam and diversion gates cause a large eddy and scour pool (100 feet wide by 15 to 20 feet deep) directly upstream of the obstruction, which dramatically alters local hydrology, water chemistry, and ecology. The project consisted of removing Happy Isles dam and associated infrastructure and revegetating the riverbanks to prevent post-project bank erosion.

This project was completed in 2006.

### **Happy Isles Fen Habitat Restoration Project**

The Happy Isles Fen is a 2-acre wetland immediately west of the Nature Center at Happy Isles in east Yosemite Valley. In 1928, the National Park Service filled in about 3 additional acres of the fen to create a parking lot. The asphalt parking lot was removed in 1970, though imported fill remained. The area affected by parking lot construction was restored to wetland conditions by removing imported fill and associated upland vegetation and revegetating with native wetland plants. This project was completed in the fall of 2003.



## **Happy Isles Gauging Station Bridge Removal**

The Happy Isles Gauging Station Bridge spanned the Merced River in the east end of Yosemite Valley. The bridge was badly damaged during the January 1997 flood and was deemed unsafe by representatives of the Federal Highway Administration. The bridge began to show signs of immediate failure in 2000 when a large sinkhole appeared on the west abutment. Due to the threat to public health and safety, the bridge was removed in the fall of 2001, thereby improving free-flowing conditions of the Merced River. The east abutment was retained to protect the operation stream flow gauge.

The bridge was removed in 2001.

## **Happy Isles to Vernal Fall Trail Reconstruction**

This project proposes to reconstruct 5,400 linear feet of the Vernal Fall Trail from Happy Isles to the base of the Mist Trail stairs. Actions include constructing an average tread width of seven feet, rebuilding trail walls, redistributing old pavement as a sub-base, and resurfacing. On steeper sections of the trail, improved traction will be provided for pedestrians. A functioning drainage system will be established in the trail corridor by paving water breaks and constructing rock drainages to channel water away from the trail.

## **Lower Yosemite Fall Project**

The Lower Yosemite Fall area is the most highly visited natural feature in Yosemite National Park. The plan rehabilitated and reconstructed the existing system of trails and bridges, relocated the restroom, and removed the existing parking area in the Lower Yosemite Fall area.

**Completion:** A Finding of No Significant Impact (FONSI) was signed by the Regional Director in May, 2002. Actions were completed in 2004.

## **Merced River Ecological Restoration at Eagle Creek Project**

Eagle Creek flows into Yosemite Valley immediately west of the Three Brothers rock formations and joins the Merced River about one-half mile downstream from Yosemite Lodge. The creek banks of the reach of Eagle Creek between Northside Drive and the Merced River were badly eroded and only sparsely vegetated, partly due to trampling by pedestrians. The eroded riverbank was recontoured, then revegetated; the trampled river terrace was decompacted; and fences were constructed to direct visitors to sandbars for river access. The ecological restoration effort involved the following:

- Plug remaining portions of abandoned sewage lines with concrete and remove the manhole and the concrete structure that crosses the creek bed.
- Restore the eroded creek channel using methods previously tested on the banks of the Merced River. Restoration techniques require building up the bank with willow cuttings, woody debris, rock and mulch.
- Revegetate the bank of Eagle Creek with native shrubs, cuttings, and seeds.

- Redirect visitors to access the river in a more appropriate location that will not cause bank erosion.

This project was completed in 2003.

### **Red Peak Pass Trail Rehabilitation**

This project reconstructed the trail from Red Peak Pass to the Triple Peak Fork of the Merced River. Work included rehabilitation of rock retaining wall, rip-rap tread, water breaks, terrace steps, and restoration of meadow rutting.

The project began in 2006 and was completed in 2011.

### **Rehabilitate Yosemite Valley Campground Restrooms**

This project rehabilitated 19 six-stall restrooms in Upper Pines, Lower Pines, and North Pines Campgrounds, as well as the 15- to 20-foot walkway approach to each restroom. Work included replacement of partitions by installing graffiti-resistant surfaces, painting of exterior trim and interior walls and floors, replacement of mirrors and toilet paper dispensers, repair of outside privacy screens, improvements to meet Americans with Disabilities Act accessibility requirements, replacement of wall vents, replacement of signs, replacement of electric service panels, improvement of lighting, and replacement of fill materials for walkway approaches. This project was completed in 2004.

### **South Entrance Station Reestablish Exit Lane**

The project included re-establishing the old road alignment for exiting-southbound traffic from Yosemite National Park and then completing asphalt repairs on the existing pavement surrounding the South Entrance Kiosk. Work included an initial geotechnical investigation to determine the road design profile. With this design information the road subgrade was regraded and compacted, then compacted fill and base material was used to create a structurally sound subbase and then the final surface treatment was compacted asphalt pavement. The initial geotechnical investigation, included 2-deep borings up to 10-ft. deep (6" Dia.) and 3-shallow borings up to 2-ft. deep (6" Dia.), to determine the existing subgrade conditions and to develop the necessary design to withstand the current traffic loadings that use this road surface. This work also included relocation of telecommunication and power lines, a light pole, as well as abandonment of an existing ventilation shaft. Construction was completed May 2012.

### **Yosemite Valley Lost Arrow Temporary Employee Housing**

This project temporarily located 6 units of portable housing for park concessionaire (DNC) employees from Curry Village to the existing 40 units of Lost Arrow temporary employee housing area at Yosemite Village, which was created subsequent to the 1997 flood that destroyed existing employee housing at other valley locations. This proposed temporary solution was developed as a part of the settlement agreement that also includes preparation of the Revised Merced Wild and Scenic River Comprehensive Management Plan/EIS. This project was completed in 2009.

## **Yosemite Valley Ahwahnee Temporary Employee Housing**

Rockfall events at Curry Village in October 2008 resulted in the permanent closure of the Terrace tent cabin employee housing area and other hard sided structures located in the rockfall hazard zone at Curry Village, as revised and expanded based on analysis conducted after the October rock fall. Prior to the October 2008 rock fall, Yosemite Institute had use of tent cabins and hard-sided structures at Curry Village for student and teacher lodging. Subsequent to the closure of tent cabins and other hard sided structures within the revised rockfall hazard zone, the former Boys Town tent cabin employee housing was converted to student and teacher lodging for Yosemite Institute, leaving a deficit of DNC employee housing. Of the 293 Curry Village employee beds lost to closure or conversion as a result of the October 2008 rock fall, relocation of housing for DNC employees was essential to support visitor use. DNC needed to replace approximately 243 to 273 employee beds. This proposed temporary solution was developed in consultation with Friends of Yosemite as part of a litigation settlement that also includes preparation of the Revised Merced Comprehensive Management Plan and Environmental Impact Statement (EIS). This action provided temporary lodging for 12 employees, and was needed to help meet immediate short-term housing needs for NPS's concessioner (DNC) until permanent employee housing is available. This project was completed in 2009.

## **Yosemite Valley Loop road Rehabilitation**

This project repaired and resurfaced existing roadway pavement, improved drainage facilities, and defined roadside parking throughout the project area. No widening or realignment of roadway off of the existing road bench was done. Areas with soft or poorly draining subgrade were excavated and replaced with better foundation materials. Low-lying areas subject to flooding will be evaluated with alternative concepts to determine the potential impacts.

**Completion:** A Finding of No Significant Impact (FONSI) was signed by the Regional Director in February 2006. Actions were completed in 2008.

## **Yosemite Valley Shuttle Bus Stop Improvements**

This project consisted of the preparation of preliminary design plans, environmental compliance documents, and construction drawings; the construction of six, 10-foot by 80-foot concrete braking pads, and the rehabilitation or replacement of 94,000 square feet of asphalt road approaches and the construction of bus stop shelters. Construction was completed in 2010.

## **Wawona Road Rehabilitation Project**

This project pulverized and repaved approximately 25 miles of the Wawona Road (Route 0014; FMSS# 10814) between Southside Drive and South Entrance. The proposal included minimal work at pullouts and intersections, which were within the existing paved footprint. This project did not alter the historic character of the road. The road width remained the same and all drainage improvements were done in accordance with the Secretary of the Interiors Standards for the Treatment of Historic Properties, in consultation with the Division of Resources Management and Science.

The existing 24-foot wide paved road will be recycled (pulverized) and overlaid with spot reconstruction of subgrade and shoulders as required.

Only minimal drainage work involving failed or severely undersized culverts will be included. For any culverts that are relatively deep, slip-lining will be considered.

Only minimal work at turnouts and intersections, which will be within the existing paved footprint.

Pavement borings will be required to design the structural section for the roadway, which would need to begin in March-April 2009 (Fifty borings, approximately every 1/2 mile over the 25-mile segment).

Areas disturbed by construction will be revegetated under guidance of the park revegetation staff.

This project was completed in 2011.

## **PRESENT**

### **Yosemite National Park Annual Fire Management Plan (Operational Fire Management Plan)**

Yosemite National Park's fire management program employs a variety of methods to accomplish and support fire and resource management objectives and to reduce the risk of wildfire in and adjacent to the park. Strategies in this plan are based on knowledge gained from fire and fuels research and monitoring. Federal fire policy has changed in the past 30 years from suppression of all wildfires to a policy allowing a single fire to be used as a tool to meet multiple land management and public safety objectives. Fuel reduction and prescribed burning have increased since the 1990 A-Rock Fire, and the fuels management program focuses on the wildland-urban interface to protect developed areas from uncontrolled wildfires. Yosemite National Park's 2008 Operational Fire Management Plan serves to utilize the new fire management guidelines in outlining procedures for managing fire in Yosemite National Park; for restoration and maintenance of ecosystems, for reduction of hazard fuels, for protection of natural and cultural resources, and for protection of wildland urban interface communities.

### **Ahwahnee Comprehensive Rehabilitation Plan**

The purpose of this project is to develop a comprehensive plan for phased, long-term rehabilitation of The Ahwahnee National Historic Landmark hotel and associated guest cottages, employee dormitory, and landscaped grounds in order to:

- restore, preserve, and protect the historic integrity and character-defining features of The Ahwahnee by rehabilitating aged or altered historic finishes and contributing landscape features;
- enhance visitor and employee safety by bringing the buildings and grounds into compliance with current building, fire, life safety, and seismic standards;

- improve hotel energy efficiency and operations by repairing or replacing outdated or inefficient building systems and components; and
- protect and enhance the visitor experience at The Ahwahnee through improved operational efficiency, increased accessibility, and rehabilitation of historic resources.

After more than 80 years in service, the hotel and associated structures are in need of rehabilitation because the facilities at The Ahwahnee are not fully compliant with the most recent building and accessibility codes, including International Building Code (IBC), National Fire Protection Association (NFPA) Code, Federal Emergency Management Agency (FEMA), IBC seismic requirements, and Americans with Disabilities Act (ADA) standards.

Many of the electrical, plumbing, and mechanical systems serving The Ahwahnee facilities are aging and need to be replaced and updated. Some historic hotel finishes and landscape components are timeworn or have been altered over the years, potentially affecting the historic integrity of this property. The current operational layout of some working areas reduces the efficiency of providing a high level of visitor services.

The architectural team is currently evaluating the operational needs and code compliance needs of The Ahwahnee. These needs, along with recommendations from recent cultural landscape and historic structures reports, detailed seismic studies, and issues and concerns identified during public scoping, will inform the development of alternatives for this project. The *Scenic Vista Management Plan* has identified several vistas at the Ahwahnee that will be considered for management.

The Finding of No Significant Impact was signed on January 3, 2012. Implementation of the plan will be through a long-term, phased approach as funding becomes available.

### **Air Quality Monitoring and Air Pollution (California Air Resources Board)**

SV, TRP- Human activities (such as suburban growth, industry, transportation, and farming and ranching) in the San Joaquin Valley, San Francisco Bay area, and Sierra foothills create air quality impacts that occasionally violate federal standards, particularly for ozone and for particulates. Some of these pollutants disperse into the Yosemite area, affecting the park's air quality and visibility. Yosemite is a Class 1 airshed according to the Clean Air Act, conferring additional protections upon the park (requiring cleaner air). Unfortunately, due to the long-distance transport of regional pollutants, the park has recorded between four and 24 exceedances of federal air quality standards for ozone annually for the last 10 years (a median of six exceedances). Additionally, the park suffers visibility degradation, especially on summer afternoons, due partly to particulate generation (the small portion of Yosemite within Madera County is a nonattainment area for particulates). While the California Air Resources Board has implemented some strict air pollution controls (such as the smog checks done biannually on all vehicles licensed for operation in the state) and seen associated improvements in air quality, impacts on the park's air quality and visibility continue. These impacts are expected to continue for the foreseeable future.

**Scheduled/projected completion:** This project is ongoing.

## Invasive Plant Management Plan Update

There are over 150 non-native plant species in Yosemite National Park, which is approximately 10% of the park's flora. Of these, 28 species are listed for control by the U.S. Department of Agriculture, California Department of Food and Agriculture, or California Exotic Pest Plant Council. Species targeted for control in Yosemite include bull thistle, mullein, yellow star thistle, spotted knapweed, perennial pepperweed, purple vetch, rose and burr clovers, Himalayan blackberry, white and yellow sweet clover, non-native wildflowers, and escaped landscaping plants such as foxglove, ox-eye daisy, pink mullein, French broom, tree-of-heaven, and black locust. The current control program includes using Global Positioning System (GPS) technology to map plant populations. Crews then remove plants using a variety of techniques, including hand pulling. Treated areas are photographed and re-visited each year to assess the results and provide follow-up treatment. The plan defines a set of comprehensive programs, including the following:

- Education and focused research.
- Prioritized prevention and control efforts using a variety of techniques and appropriate mitigation measures.
- Systematic monitoring and documentation of invasive plant status and the results of management efforts.
- Restoration of ecosystems altered by invasive plants.

Control methods being considered include some combination of the following: hand-pulling or using various machines to try and remove plants; releasing predatory insects or fungus to attack plants; educating users and staff about preventative measures; and using chemical treatments derived from natural products like vinegar, or manufactured chemicals like glyphosphate. Program goals include eradicating (or at least controlling) invasive plant species; preventing new invasions; restoring and maintaining desirable plant communities and healthy ecosystem; enhancing the visitor experience; and educating park staff, partners, and users.

The original FONSI was signed in 2008 and an update was completed in 2011. Annual workplans are posted on the park website for public review.

## Curry Village Rockfall Hazard Zone Structures Project

Built in the 1920s, rustic hard-sided cabins with bath and cabins without bath make up the majority of the structures in the closed zone. Six other structures include the Foster Curry Cabin (Tresidder Residence), associated visitor support structures (e.g., restrooms, shower house), and two non-historic structures.

The selected action will remove all structures as to maximize safety for park visitors and employees and eliminate the need for administrative access to the closed area. This entails documentation of the historic structures, salvage of historic materials for reuse, removal of all structures remaining in the rockfall zone, installation of interpretative materials, and allowing the area to return to its natural state.

The Finding of No Significant Impact (FONSI) was signed on February 7, 2012, and the corresponding Memorandum of Agreement (MOA) was signed on December 28, 2011.

Since the signing of the FONSI and MOA, new data determined that an additional five (5) buildings were located within the rock fall hazard area. The disposition of these structures will be amended to the Curry Village Rockfall Hazard Zone Structures Project FONSI and MOA. Implementation of the plan will occur prior to the signing of the Decision Document for the Merced River Plan in 2013.

### **Climate Change/Petition to list the pika as a threatened species (US EPA/US Fish and Wildlife Service)**

It is now the accepted understanding in the scientific community that climate change (global warming) is presently occurring and that human activities are causing a substantial portion of such warming. In Yosemite, climatologists have noticed earlier snowpack melting in spring, higher spring temperatures, more precipitation falling as rain (instead of snow), dryer spring seasons, earlier green-up times, a three-degree increase in nighttime low temperatures, a 50% reduction in the size of Lyell Glacier, and increased mortality among conifers — all changes that are attributable at least in part to human activity.

Comparing contemporary small mammal ranges in Yosemite with those observed by Joseph Bird Grinnell in the early 20th century, biologists have determined that of the 28 small mammals observed in his studies, half had expanded their range upward by more than 500 meters (1,600 feet). The pika, a member of the rabbit family that tends to live at higher elevations, exemplifies this trend. The small animal is adapted to life at or above timberline, gathering and drying tundra grasses and forbs for winter use and possessing (for the rabbit family) small ears to minimize heat loss. Its high range means that if the animal responds to a warming climate by moving upslope, it may eventually run out of room to range. If climate change continues unabated and the pika's response to move upslope continues, it appears that there will be no higher elevations for the mammal to occupy. For this reason (and pursuant to a lawsuit from a conservation group against the USFWS), the animal is now a candidate for listing as a threatened species pursuant to the Endangered Species Act. At least two other species of small mammals, a chipmunk and a woodrat, have seen dramatic shrinkage in the overall size of their ranges, and are now extremely rare in Yosemite. Scheduled/projected completion: This project is ongoing.

### **Commercial Use Authorization for Commercial Activities**

The purpose for the issuance of these commercial use authorizations (CUA, previously titled Incidental Business Permit) is to regulate and oversee operations of permit holders involved in conducting commercially guided day hiking, overnight backpacking, fishing, photography workshops, stock use (pack animal trips and pack support trips for hikers), and Nordic skiing activities in Yosemite National Park. In addition to the base CUA, additional uses and activities may be allowed depending on the holder's request and compliance with all applicable laws, regulations, and guidelines. Conditions for these additional activities are stipulated in the body of the individual permit for each activity. The permitted activities are to be conducted only in those areas of Yosemite National Park open to the public

and authorized by the permit. The permit holder is required to obtain any additional permits or licenses as required by law.

Permits are renewed annually.

## **Comprehensive Interpretive Plan**

The Comprehensive Interpretive Planning (CIP) process is established in Director's Order 6 and is the basic planning component for interpretation. The CIP is a tool for making choices. It helps parks decide what their objectives are, who their audiences are, and what mix of media and personal services to use. The product is not the plan, but an effective and efficient interpretive program that achieves management goals, provides appropriate services for our visitors, and promotes visitor experiences.

The heart of the CIP is the Long-Range Interpretive Plan (LRIP) that defines the overall vision and long-term (five to ten years) interpretive goals of the park. The process that defines the LRIP also encourages development of targeted, realistic strategies and actions that work toward achievement of its goals. Actions divided into annual, achievable steps are reproduced in the Annual Implementation Plan. Creating annual plans via this "stepping down" of the LRIP simplifies much of the annual planning process because specific goals already have been identified in the LRIP. The last section of the CIP is the Interpretive Database, which is a compilation of information needed to build the other two components. It includes media inventories, the park's strategic plan, enabling legislation, visitor surveys, reports, a bibliography, and other basic information.

TL- The Comprehensive Interpretive Plan (CIP), which will outline a comprehensive approach to interpreting park natural and cultural resources. The CIP is necessary to ensure long-term protection of resources through visitor understanding and enjoyment.

The final product of this effort will guide interpretation and education in Yosemite for the next five to 10 years.

## **Crane Flat Utilities**

This project (Phases 1 and 2) will replace the waterlines and appurtenances for the entire Crane Flat area with the goal of eliminating substantial loss in the system. The existing system includes 9,700 linear feet (lf) of 6" main, 4,066 lf of 4" main and 300 lf of 1" drain pipe. This existing distribution system was designed and installed in the mid 1960's. The system has reached its design life and replacement is required to meet facility maintenance goals. The substantial amount of leakage throughout the entire system eliminates section replacement or pipe-bursting as effective maintenance options.

Phase 1 was completed in 2009. Archeological and anthropological studies were conducted in 2010 to inform Phase 2 design.



## **East Yosemite Valley Utilities Improvement Plan**

The existing utility infrastructure serving Yosemite Valley was identified as a potential problem due to its age, condition inadequate capacity, inaccessibility to future facilities and inappropriate location in environmentally sensitive areas. The National Park Service completed an Environmental Assessment and a Finding of No Significant Impact for the Utilities Master Plan was signed in October 2003 to allow efficient relocation and upgrading of utility systems to provide for utility needs while reducing long-term environmental impacts from utility repair and maintenance activities. Construction of phase 1 of the improvement began in 2005 and has been ongoing with implementation of the utility improvements occurring in three phases over 10 years.

## **Reconstructing Critically Eroded Sections of El Portal Road**

The purpose of this project is to reconstruct the critically eroded sections of El Portal Road and repair those portions of the road and embankment that are at risk of failure as a result of the damage initially caused by high-water events of the Merced River, including the devastating flood of January 1997. By promptly reconstructing the failing portions of El Portal Road, park visitors will be protected from the hazard of a sudden road failure, and access to Yosemite Valley will be maintained. The Finding of No Significant Impacts was signed in July 2007.

## **Fuels reductions/forest rehabilitation projects (US Forest Service)**

The Sierra and Stanislaus national forests are both conducting a variety of projects aimed at reducing fuels and/or restoring more natural conditions in their west-slope Sierra forests. These projects have two primary purposes: to reduce the intensity and spread of wildfires across the landscape and near communities, and to reduce stand density within the lower and mid canopy layers of conifer stands to such a level as to provide for increased stand resiliency, growth, and vigor. To accomplish these goals, workers in the forests thin conifer stands to reduce stand densities and ladder fuels; masticate ladder fuels and brush/shrub patches; utilize prescribed burning, understory and pile; manually treat and/or prescribed burn noxious weed infestations; and site prepare and plant failed conifer plantations. Areas where such work is being conducted include:

- the Dinkey North and South areas about 30 miles northeast of Fresno, California;
- the High Sierra Ranger District (specifically, creating a fuel break);
- the Kings River drainage south of Yosemite;
- the Highway 4 corridor from Poison Spring to Spicer Road;
- the Calaveras Ranger District, Northeast of Dornington, near Prather Meadows and Big Rattlesnake Creek;
- the Middle Fork Tuolumne River area;
- Greeley Hill and Wagner Ridge;

- the Twomile planning area, located within the Clavey River watershed, encompassing portions of Hull Creek, Twomile Creek, and the Clavey River;
- the Pacific Southwest Research Station;
- Fence Creek Road (6N06) and Wagner Cabin Tract; and
- Gooseberry Forest and Meadow, north of Bell Meadow and west of Gianelli Trailhead.

**Scheduled/projected completion:** Some form of fuel reduction/forest restoration is ongoing at all times in the west-slope Sierra national forests.

## **General Ecological Restoration**

Yosemite National Park undertakes actions for ecological restoration as independent actions or as part of a larger plan on an ongoing basis. These actions involve a varying degree of compliance. Many of these projects are not major actions in themselves, but these actions collectively are considered in the analysis of this plan.

These actions are ongoing.

## **Yosemite National Park General Management Plan**

As defined in the NPS park planning program standards, the purpose of the GM is to ensure that park managers and stakeholders share a clearly defined understanding of the resource conditions, opportunities for visitor experiences, and general kind of management, access, and development that will best achieve the park's purpose and conserve its resources unimpaired for the enjoyment of future generations. The GMP is the blueprint for improving and preserving the park for the next century. It was finalized and signed in 1980. The plan describes actions that would achieve five broad goals:

- Reclaim Priceless Natural Beauty;
- Markedly Reduce Traffic Congestion;
- Allow Natural Processes to Prevail;
- Reduce Crowding; and
- Promote Visitor Understanding and Enjoyment.

A complete description of how the Yosemite National Park GMP interfaces with the Merced River Plan is included in Appendix A.

## **Half Dome Trail Stewardship Plan**

The NPS is developing a management plan to address impacts caused by crowding and congestion along the Half Dome trail. The purpose of this project is to provide appropriate opportunities for recreation on the Half Dome Trail given its location in designated wilderness. The wilderness character of the trail corridor and the ability of visitors to manage their own risk will be improved.

Increased use of the Half Dome Trail has led to conditions that adversely impact wilderness character, including:

- **Unconfined Recreational Experience:** Crowding and long lines on the sub dome, summit, and cables limit freedom of movement
- **Opportunities for Solitude:** High encounter rates on the trail result in inappropriate conditions for experiencing solitude in wilderness
- **Natural Conditions:** Visitor impacts include trail erosion, habituated wildlife, litter, and human waste have resulted in long-term effects to natural resources
- **Self-Reliance:** Queuing and congestion on the cables compromise the ability of hikers to manage their own risks

An interim permit system was implemented in 2010-2012, limiting day use on the trail to 400 people per day. The selected action limits use to 300 people per day.

The FONSI is anticipated in Fall/Winter 2012 and the plan will be implemented for the hiking season in 2013.

## **High Elevation Aquatic Resources Management Plan**

Two species of native amphibians (Sierra Nevada yellow-legged frog and Yosemite toad) are experiencing serious population declines. Habitat restoration and preventative measures are needed to prevent additional loss and the potential extirpation or extinction of these species within the park or the Sierra Nevada, respectively. The presence of introduced nonnative invasive aquatic species is decreasing the abundance and distribution of native species, resulting in unnatural diversity and abundance, and impacting the healthy functioning Yosemite's high elevation aquatic ecosystems. Management action is needed to remove and limit the spread of existing invasive species, and prevent the introduction of new invasive species. Protection of the park's high elevation aquatic ecosystems requires an understanding of the current status of these systems and a framework for evaluating and prioritizing research needs and management actions that may be necessary to ensure that park resources and values within these systems are unimpaired.

Public Scoping was conducted in summer 2008.

## **Wahhoga Indian Cultural Center**

In keeping with Yosemite's General Management Plan, the National Park Service entered into an agreement with the American Indian Council of Mariposa County, Inc. (also known as The Southern Sierra Miwuk Nation) in 1997 to work together in establishing an Indian Cultural Center at Wahhoga, the site of the last historically occupied Indian village in Yosemite Valley (just west of the Camp 4 walk-in campground). The center will provide a location for traditionally associated American Indian peoples to practice traditional cultural activities and ceremonies, as well as teach traditional lifeways. The center will be available to the public and provide a unique opportunity for visitor awareness of local Native American cultures. Through this understanding of local culture and traditions, guests will

gain a greater understanding of the park's natural and cultural resources and their significance to the cultural systems of traditionally associated American Indians. The project has been designed to include both traditional and modern structures. The traditional structures planned for the site include a ceremonial roundhouse, one sweatlodge, and numerous cedar bark umachas (conical houses), and a sun shelter and demonstration area. A historic cabin would be relocated to the site. A community building and small parking area would comprise the modern buildings and structures.

Construction on traditional structures began in 2009; there is no current estimated date for project completion.

### **Inyo National Forest Travel Management Plan and Forest Plan Revision (US Forest Service)**

The U.S. Forest Service will be developing travel management plans and forest plans for all national forests in California over the next few years. Travel management plans specify which forms of travel are allowed in which areas of the national forests. Forest plans guide where and under what conditions an activity or project on national forest lands can generally proceed. Some of the forests have completed one or both of these tasks.

Scheduled/projected completion: mid-2010s.

### **Mariposa County General Plan Housing Element Update**

Mariposa County is updating the Housing Element of its County General Plan. The Housing Element Update does not provide approval for any specific projects (no ground disturbance would result directly from this plan), but rather provides broad guidance to meet the California State legislature's intent of providing for the availability of housing, expanding housing opportunities, and accommodating the housing needs of all economic segments and income groups in the county.

Scheduled/projected completion: 2010.

### **Mariposa County General Plan (Update)**

The Mariposa County General Plan updated the countywide zoning ordinances and related implementing documents. The update allowed Mariposa County to comply with current California law and changes to state law since the 1980 General Plan was adopted. This update followed established public involvement protocol and responded to countywide land-use issues. The Mariposa County General Plan update was completed in 2005.

### **Parkwide Communication Data Network**

Yosemite National Park is implementing a Communications Data Network (CDN) infrastructure upgrade utilizing available, commercial off-the-shelf technology supporting a single "hybrid communication backbone" employed throughout the park -- to maximize existing equipment use,

minimize current and planned costs, to fulfill the park's future operational and security needs. This "backbone" will be a microwave and fiber optic pipeline used to transfer computer LAN data, radio communications, security and safety video systems, telephony, burglar/intrusion, fire alarm systems, traffic collection data, and telemetry throughout Yosemite. Upgrading the network also serves to enhance compliance and utilization of the narrowband and digital P25 compliant radio infrastructure as well as providing enhanced LAN connectivity for remote areas such as Wawona, Crane Flat, Hodgdon Meadows, and Tuolumne Meadows.

The CDN is designed to serve six geographic areas of the park as well as the five park entrance stations. The geographic areas include El Portal, Yosemite Valley, Wawona, Crane Flat, Hodgdon, Tuolumne Meadows, and Hetch Hetchy. The final installation will be a hybrid infrastructure, based around proven microwave technology that links the geographic areas with multiple T-3 level bandwidth managed as necessary by park staff. There will be no need to rely on an independent service provider for maintenance of the system, as the backbone will be maintained by park staff.

During the first phase of project design, a needs assessment, schematic design and installation strategy, and frequency study will be commissioned to identify what system components are needed for enhanced connectivity to the different geographic regions throughout the park. Possible backbone technologies include fiber optics, VHF radio, UHF radio, microwave radio, cellular, and satellite.

Fiber optic is envisioned as the solution to connect government facilities in the Wawona Maintenance area and also Big Oak Flat Entrance Station to the Hodgdon Maintenance area. Fiber optic will also be utilized to enhance infrastructure in Yosemite Valley resulting in all NPS administration facilities being located on one fiber network. Wireless bridges and point-to-point technology will also be utilized to connect remote facilities as required.

A Finding of No Significant Impact was signed for the Parkwide Communications Data Network and Environmental Assessment in May 2010. This project will be implemented over 5-10 years.

### **Recreational Facility Analysis (US Forest Service)**

In 2007, the USFS completed an analysis of its public recreation sites. The analysis examined existing demand for the recreational resources, the need to update or change the sites to meet the demand (including closing some sites that no longer have demand), and the agency's ability to make the recommended changes. The analysis concluded with a program of work to reduce the deferred maintenance on the sites by 20% in the ensuing five years. The work will include everything from improvements at some sites to closure of others.

**Scheduled/projected completion:** This project is ongoing.

### **Scenic Vista Management Plan**

The purpose of the Scenic Vista Programmatic Management Plan for Yosemite National Park is to develop a systematic program to protect and restore Yosemite's important viewpoints, vistas, and the natural processes that created them. This plan will fulfill the park's obligations under the National

Historic Preservation Act (NHPA) and National Environmental Policy Act (NEPA). The program will replace the park's current case by case approach and will enable and guide management actions by the NPS to:

- Develop an objective process to determine what methods would be used to manage vistas
- Preserve the historic and cultural settings in which the viewpoints were established
- Restore and maintain scenic vistas through appropriate vegetation management actions such as trimming or removing trees and clearing brush
- Accomplish scenic vista management, whenever practicable, by restoring natural species composition, structure, and function to systems, preferably by using traditional American Indian vegetation management practices, including fire

The Finding of No Significant Impact was signed in 2010 and associated actions are being implemented in locations outside of the Merced River corridor. The Merced River Plan will be the compliance document for scenic vista management actions to be taken within the river corridor.

### **Special Use Permit Issuance for Events and Activities**

Within Yosemite National Park, special use permits are required for first amendment activities, special events, business operations, public assembly, sale, or distribution of printed material, or construction. Approximately 50 special use permits are issued annually for special events (often weddings) at Tenaya Lake.

### **Tioga Road Rehabilitations**

The project proposes restoration of the roadbed by repaving, restoring ditches and shoulders, addressing turnouts, and replacing undersized or failing culverts to facilitate drainage. Specifically proposed in this plan:

- Historic stone culvert headwalls would be maintained or carefully removed and reconstructed.
- In addition to culverts, drainage ditches along this segment would be reconstructed to help facilitate proper drainage of the roadway.
- Some undesignated turnouts would be restored to natural conditions. These areas are either considered unsafe due to their inadequate size, sight distance, and/or location partially on and off the roadway; or they incur damage to nearby natural resources.
- Designated, formal parking areas would be retained and repaved. Additional parking areas would be delineated and formalized with paving.
- Selective thinning of roadside trees would occur to improve sight distance and prevent root penetration into the roadway, which is currently causing upheavals in the shoulder and paved roadway surface. Thinning of trees would also reduce ice build-up on the road, and reduce snow plow damage.

A Finding of No Significant Impacts is anticipated in 2012. Implementation will be phased over 5 or more years.

## **Tuolumne Wild and Scenic River Comprehensive Management Plan**

The NPS is preparing a comprehensive management plan for the segments of the Tuolumne River corridor within Yosemite National Park. When completed, this document will guide the future management of the river to ensure the protection and enhancement of the river's Outstandingly Remarkable Values and its free-flowing condition. The plan will also determine more specifically the programs and activities needed to meet river protection goals in Tuolumne Meadows and throughout the river corridor.

To achieve these objectives, the Tuolumne River plan will:

- review, and if necessary revise, the existing boundaries and segment classifications of the Wild and Scenic River corridor;
- establish management zoning in the river corridor to provide for a spectrum of interrelated resource conditions and visitor experiences;
- establish clearly stated long-term goals (desired conditions) for resource protection and visitor experiences, and identify the indicators and standards for a monitoring program that will ensure these goals are met and maintained over time;
- address user capacity by identifying the appropriate kinds and levels of use that protect river values while achieving and maintaining the desired conditions; and
- identify specific programs and facilities needed to implement the long-term goals for the Tuolumne Meadows area established by the Tuolumne River plan.

The Tuolumne is rich in what the Wild and Scenic Rivers Act calls outstandingly remarkable values. It is home to a vast range of ecologic and sociocultural values, including:

- intact ecosystems providing habitat for a remarkable diversity of species;
- some of the most extensive subalpine meadow and riparian communities in the Sierra Nevada;
- exceptionally well preserved evidence of glacial processes;
- regionally significant archeological evidence of prehistoric travel, trade, and settlement;
- Prehistoric resources important for maintaining cultural traditions of American Indian people;
- Magnificent scenery;
- Outstanding opportunities for a diversity of recreational experiences; and
- Invaluable opportunities to examine natural and cultural resources with high research value.

A draft environmental impact statement is anticipated in Fall/Winter 2012.

## Vegetation Management Plan

The Yosemite National Park Vegetation Management Plan (NPS 1997a) establishes guidance for vegetation management issues. The purpose of the plan is to define objectives, techniques and strategies for managing vegetation while preserving scenic resources and providing resource and visitor protection. This plan also contains sections pertaining to manipulating roadside vegetation including providing clearance for large vehicles (e.g., snow loading equipment), hazard tree safety, road user safety, and wildlife protection.

One objective of the Vegetative Management Plan is to provide for visitor recreation, access, enjoyment, safety, and understanding of park plant communities and ecosystems (NPS 1997a). This can be accomplished by managing for and allowing only those types and levels of public, administrative, or consumptive uses that do not impair park native plant communities or threatened, endangered, candidate, or sensitive species. Ecologically sensitive areas are to be protected to prohibit impairment, with development and use directed to environments least vulnerable to degradation or where such use will not impact the viability of these areas and their scenic and scientific values (NPS 1997a).

One solution involves limitation of access to sensitive resources, which includes:

- Identify and eliminate those human activities, including management actions that cause damage and affect resource integrity.
- In non-wilderness areas, construct fences, boardwalks, hardened trails, and other structures where necessary to protect soils and vegetation from human-use impacts.
- Provide closures of areas undergoing restoration and revegetation from human activities until the rehabilitation has been fully accomplished.
- Develop and maintain signing and educational material to educate visitors and convince them of their obligation to help protect park resources.
- Roadside management: weeding by volunteers and employees who recognize certain species and use their own time to eradicate them.
- Revegetation is another important objective, and may include any or all of the following steps:
  - Elimination of non-native plant species;
  - Application of native or non-native (sterile rice straw) mulches;
  - Seeding from locally gathered native plants appropriate to the site;
  - Revegetation with plants salvaged from the site prior to physical restoration or from adjacent areas when these are available;
  - Planting with propagated plants that have been produced from plant materials previously collected from the site;
  - Installation of temporary or permanent area closures to allow plant establishment and protection from potential human-caused disturbances.



- Revegetated sites should be monitored and maintained for a number of years following replanting (NPS 1997a). Maintenance prevents the establishment of non-native plants and monitoring will help assess the effectiveness of various planting techniques and the feasibility of transplanting various plant species.

On-going.

## Yosemite Environmental Education Campus

NatureBridge, an NPS nonprofit park partner, has provided environmental education programs in Yosemite National Park since 1971 at the NPS facility at Crane Flat. Most of the campus structures and utilities are more than 60 years old, energy inefficient, and difficult to retrofit to achieve modern standards for health, safety, and accessibility. In addition, the facility can accommodate only a fraction of the students in the program; the remainder must be based elsewhere in the park, in expensive commercial lodging. To address these issues, NatureBridge and the NPS are considering options to provide better facilities by redeveloping the existing campus (Crane Flat) or constructing a new education center at a different location (and restoring the Crane Flat campus to natural conditions). The draft environmental impact statement (EIS), released in May 2009, proposes to develop a new educational facility at Henness Ridge, near Yosemite West, and to restore Crane Flat to natural conditions and provide habitat for sensitive species.

Scheduled/projected completion: The Record of Decision was signed by the Regional Director on April 2, 2010.

The purpose of the proposed action is to:

- Promote the development of future stewards for the environment and our national parks
- Provide an environmental education campus location and program that better serves the combined missions of the Yosemite Institute and Yosemite National Park
- Provide a safe and universally accessible campus facility that meets modern health and safety standards
- Increase overall program student capacity and reduce reliance upon commercial lodging (i.e., reduce the number of students currently staying overnight in Yosemite Valley) to make the program more affordable and more accessible to all children.
- Provide a location conducive to multi-day experiential programs that complement California state educational standards and offer opportunities for research and study of the natural world
- Provide a campus facility that meets or exceeds national Leadership in Energy and Environmental Design (LEED) standards
- Create a campus design that better encourages responsible interaction with the environment
- Establish an ecologically sensitive campus that protects park resources and provides exemplary environmental educational learning opportunities

The Final EIS for this project was released in January 2010 followed by a Record of Decision in spring of 2010.

## **Restoration of the Mariposa Grove Ecosystem**

Nearly 150 years after U.S. Congress passed landmark legislation preserving both the Mariposa Grove of Giant Sequoias and Yosemite Valley, comprehensive actions are needed to ensure that the Mariposa Grove ecosystem continues to thrive and provide inspiration and enjoyment for future generations. The primary goals of this project are to restore degraded habitat and natural processes critical to the long-term health of the Grove and improve the overall experience for visitors. The park began public scoping for this project in fall of 2011. A Draft EIS is anticipated for public release prior to the Record of Decision for the Merced River Plan.

## **REASONABLY FORESEEABLE FUTURE**

### **Changing demographics of visitors in Yosemite**

TRP- Americans, and especially Westerners, have expressed an increasing interest in recreation in the last twenty years (all kinds of recreation, but especially bird watching, hiking, and walking (Cordell 2004)). In Yosemite, visitors have expressed an interest in kayaking the Tuolumne River. Other visitors already hang-glide from Glacier Point and pursue other activities not ordinarily found in other national parks. Between 28 and 55% of visitors take a hike while in Yosemite, and 23 to 42% observe wildlife, but only 3 to 6% participate in rock climbing (citation needed here). These percentages change over time, bringing associated changes in demand to park resources and managers.

### **Concessioner Prospectus**

The National Park Service (NPS) has continued the contract with DNC Parks and Resorts at Yosemite, Inc. to provide visitor services within the park from October 1, 2011 through January 31, 2015. The previous contract extension expires on September 30, 2011. The park is continuing the process of developing a new prospectus for visitor services. The continuation of the contract was deemed necessary to ensure that there is no disruption of visitor services while the park works on several planning efforts. The provisions of the current contract will not change. DNC Parks and Resorts at Yosemite, Inc. will continue to provide existing services from October 1, 2011 through January 31, 2015 or until such time as a new contract regarding the visitor services provided under the contract is awarded, whichever comes first.

### **Curry Village Rehabilitation of Historic Cabins with Bath Structures**

This project will address a rehabilitation program for the twenty-six (26) guest cabins with baths (24 duplex and 2 quadplex Bungalows, or WIBs) that are still being used for guest accommodations on the western side of Curry Village just north of the rockfall hazard zone. Built from 1918 to 1922 by Curry Company, these 26 bungalow structures have deteriorating and failing foundations. The structures

were originally built using rocks as piers where practical and most often with wood piers set directly on the ground. Perpetual shade of the southern cliffs, the flow of water off Glacier Point cliffs, and seasonally deposited silt on the upslope side are rotting out many softwood piers, rim joists, sub and finish floor, and exterior vertical base sheathing. This project is currently in the design stage and would be implemented in a multi-year phased project.

## **Yosemite Wilderness Stewardship Plan**

The National Park Service will be updating the 1989 Yosemite National Park Wilderness Management Plan. The objective of updating the plan is to provide guidance to park operations for the successful management of Yosemite's designated wilderness, which comprises over 95% of the park. The plan will address land management issues within the wilderness including visitor use, vegetation associations, air resources, noise issues, watershed, soils, cultural landscapes, and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra Camps in Yosemite National Park.

The development of the EIS update to the plan is anticipated to begin in 2013.

# **APPENDIX C**

## **MITIGATION MEASURES**

## APPENDIX C: MITIGATION MEASURES

The National Park Service places a strong emphasis on avoidance, minimization, and mitigation of impacts. To help ensure that field activities protect natural, cultural, and social resources and the quality of the visitor experience, mitigation measures have been developed. The following section discusses mitigation measures that would occur prior to, during, and after construction of specific management actions.

Topic	Mitigation Measure	Responsibility
<b>GENERAL CONSTRUCTION MANAGEMENT MEASURES</b>		
<b>MM-GCM-1</b> General Construction Management	<p>All Contractor and subcontractor employees shall receive a brief orientation about working in Yosemite National Park and the El Portal Administrative Site prior to actually performing work. The orientation describes the efforts to be taken by the Contractor and subcontractor employees to protect the natural, cultural and physical resources of YNP while working on this and other projects. This orientation also describes mitigation and other environmental protection measures that must be adhered to at all times while in the Park.</p> <p>All contractor and subcontractor employees shall view a government provided orientation video to ensure each is fully aware of the natural and cultural resource protection and mitigation requirements of work at YNP, or in the El Portal Administrative Site. Government staff will provide the initial orientation. Subsequent on-going awareness orientation for new employees and when site conditions change shall be performed by contractor and integrated into construction operation procedures.</p> <p>The Contractor shall maintain a manifest tracking all contractor personnel, when they received their orientation training, and when they started work. Contractor personnel shall be field identifiable as having received their orientation training by means of a readily visible sticker on their hard hat.</p> <p>Prior to entry into the park, Contractor shall steam-clean heavy equipment to prevent importation of non-native plant species, tighten hydraulic fittings, ensure hydraulic hoses are in good condition and replace if damaged, and repair all petroleum leaks. Inspect the project to ensure that impacts stay within the parameters of the project area and do not escalate beyond the scope of the environmental assessment, as well as to ensure that the project conforms with all applicable permits or project conditions. Store all construction equipment within the delineated work limits. Contractor shall also confine work areas within creek channels to the smallest area necessary.</p> <p>If deemed necessary, demolition/construction work on weekends or federal government holidays may be authorized, with prior written approval of the Superintendent.</p> <p>Contractor shall remove all tools, equipment, barricades, signs, surplus materials, and rubbish from the project work limits upon project completion. Contractor shall repair any asphalt surfaces that are damaged due to work on the project to original condition. Contractors shall also remove all debris from the project site, including all visible concrete, timber, and metal pieces.</p> <p>The park shall develop a Communications Strategy Plan to alert necessary park and Concessioner employees, residents and visitors to pertinent elements of the construction work schedule.</p> <p>Contractor shall verify utility locations by contacting the Underground Services Alert prior to the start of construction.</p>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>GENERAL CONSTRUCTION MANAGEMENT MEASURES (cont.)</b>		
<b>MM-GCM-1</b> General Construction Management (cont.)	<p>The Contractor shall provide protective fencing enclosures around construction areas, including utility trenches to protect public health and safety.</p> <p>The NPS will apply for and comply with all federal and state permits required for construction-related activities.</p> <p>Contractor and NPS shall implement compliance monitoring to ensure that the project remains within the parameters of National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance documents.</p> <p>Develop an emergency notification plan that complies with park, federal, and state requirements and allows contractors to properly notify park, federal, and/or state personnel in the event of an emergency during construction activities. This plan will address notification requirements related to fire, personnel, and/or visitor injury, releases of spilled material, evacuation processes, etc. The emergency notification plan will be submitted to the park for review/approval prior to commencement of construction activities.</p> <p>Notify utilities prior to construction activities Identify locations of existing utilities prior to removal activity to prevent damage to utilities. The Underground Services Alert and NPS maintenance staff will be informed 72 hours prior to any ground disturbance. Construction-related activities will not proceed until the process of locating existing utilities is completed (water, wastewater, electric, communications, and telephone lines). An emergency response plan will be required of the contractor.</p>	
<b>SOILS AND GEOHAZARDS</b>		
<b>MM-GEO-1</b> Soils Management	<p>The Contractor shall confine all earth moving activities to within the work limits as defined in the site plans. The displacement of soil or other materials outside the defined limits shall be approved by the contracting officer.</p> <p>Landscape: Land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.</p> <p>Topsoil shall be salvaged and placed in a separate location from sub-soils and replaced on top of other soils as the trench is backfilled. The location for stock piling soils and other woody materials shall be approved by the contracting officer.</p> <p>Fungal Pathogens In Soil (Root Rot): Fungal pathogens that have negative impacts on oaks and conifers are present in certain areas in Yosemite Valley. Soil infected with these pathogens shall not be imported into areas that are free of the pathogens. If construction drawings indicate that infected soil is present in the work site, the following procedures must be followed:</p> <ul style="list-style-type: none"> <li>• Ensure that infected soil is stored within the construction zone. Should infected soils be stockpiled outside of the construction zone, ensure that stockpiles are placed outside of areas that do not have the fungal pathogen. Protect stockpiles of infected soil to prevent transport by wind, water, animal, or human traffic.</li> <li>• Clean equipment buckets and tires or hand tools used in areas containing fungal pathogens before moving to or working in unaffected areas.</li> <li>• Whenever possible, all stumps shall be removed from excavations and disposed of in a legal manner outside of the Yosemite National Park boundary.</li> </ul>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>SOILS AND GEOHAZARDS (cont.)</b>		
MM-GEO-1 Soils Management (cont.)	<ul style="list-style-type: none"> <li>Stump Treatment when stumps cannot be removed: The treatments following tree removal must be universal throughout the park to avoid inadvertently spreading infection. Eradication of the disease is not possible, but its' spread can be managed.               <ul style="list-style-type: none"> <li>Conifers: Treat all stumps (&gt;6 inches in diameter in recreational use areas, &gt;12 inches diameter in undeveloped areas) with Sporax within a few days of felling the tree. If a stump is ground, it still must be treated with Sporax, and then covered with soil. If the stump is removed, no chemical treatment is required. Remove all of the root material &gt;3 inches in diameter. Standing trees that have been dead for less than one year must have stumps treated with Sporax once they are removed.</li> <li>Deciduous: Oaks should be left whenever possible, if the tree must be cut, the entire stump and root system must be removed from the Park.</li> <li>Disturb no more than 15 percent of the roots for any given tree.</li> <li>Do not over-water oak trees.</li> <li>Do not compact soil within drip lines of the tree.</li> </ul> </li> <li>Treatment of Infected Soils: Remove root material by sifting or sorting soil before backfilling.               <ul style="list-style-type: none"> <li>Treatment of soils in an annosus zone. Only infected HA areas need to be treated for removal of root material. Standard specification for roots to be removed from disturbed soil: &gt;3 inches diameter or &gt;20 inches in length. Remove ALL stumps from excavation.</li> <li>Do not move soil from infected areas.</li> <li>Topsoil shall be salvaged and reused in the same place from which it was excavated. If the soil is to be windrowed and used later, it should be sorted for root chunks prior to storage.</li> <li>Conserve and salvage topsoil for reuse. Materials will be reused to the maximum extent possible</li> <li>All disturbed soil and fill slopes shall be stabilized in a manner consistent with the provisions of MM-HYD-1.</li> </ul> </li> </ul>	
<b>HYDROLOGY AND WATER QUALITY</b>		
MM-HYD-1 Stormwater Pollution Prevention Plan	Contractor shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that designates construction best management practices to be used to control the sources of fine sediment and to capture and filter it before entering the river. The SWPPP shall define the characteristics of the site, identify the type of construction that will be occurring, and describe the practices that will be implemented to control erosion and the release of pollutants in stormwater. At a minimum, the SWPPP shall address the following, as applicable:	Contractor

Topic	Mitigation Measure	Responsibility
<b>HYDROLOGY AND WATER QUALITY (cont.)</b>		
<b>MM-HYD-1</b> Stormwater Pollution Prevention Plan (cont.)	<p><b>Stabilization Practices</b></p> <ul style="list-style-type: none"> <li>The stabilization practices to be implemented shall specify the intended stabilization practices, which may include one or more of the following: temporary seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, erosion control mats, protection of trees, preservation of mature vegetation, etc. On the daily CQC Report, the Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and/or grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Unless otherwise directed by the Contracting Officer for the reasons below (i.e., unsuitable conditions or no activity for less than 21 days), stabilization practices shall be initiated as soon as practicable, in any portion of the site where construction activities have temporarily or permanently ceased, but no more than 14 calendar days after the activities cease.</li> <li>Unsuitable Conditions - Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.</li> <li>No Activity for Less Than 21 Days - Where construction activity will resume on a portion of the site within 21 days from when activities ceased (e.g., the total time period that construction activity is temporarily ceased is less than 21 days), then stabilization practices do not have to be initiated on that portion of the site by the 14th day after construction activity temporarily ceased.</li> </ul> <p><b>Structural Practices</b></p> <ul style="list-style-type: none"> <li>The Contractor shall implement structural practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Location and details of installation of structural practices shall be depicted on the construction drawings.</li> </ul> <p><b>Silt Fences</b></p> <ul style="list-style-type: none"> <li>The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations indicated on the drawings or as needed based on Contractor operations. Final removal of silt fence barriers shall be upon approval by the Contracting Officer.</li> <li>Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6-inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the COR.</li> </ul>	



Topic	Mitigation Measure	Responsibility																					
<b>HYDROLOGY AND WATER QUALITY (cont.)</b>																							
<b>MM-HYD-1</b> Stormwater Pollution Prevention Plan (cont.)	<p><b>Straw Bales</b></p> <ul style="list-style-type: none"> <li>Straw bales are not authorized for use in storm water control at YNP. They have the potential to introduce exotic species into the Park environment.</li> </ul> <p><b>Diversion Dikes</b></p> <ul style="list-style-type: none"> <li>Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic. Diversion dikes shall be located as shown on the drawings or as needed based on Contractor operations. Location of diversion dikes shall be fully coordinated with cultural and natural environmental protection requirements described in Section 01355, Natural, Cultural, and Physical Resources Protection.</li> </ul> <p><b>Filter Fabric</b></p> <ul style="list-style-type: none"> <li>The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments that are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:</li> </ul> <table> <tr> <th colspan="3">FILTER FABRIC FOR SILT SCREEN FENCE</th></tr> <tr> <th><u>Physical Property</u></th><th><u>Test Procedure</u></th><th><u>Strength Requirement</u></th></tr> <tr> <td>Grab Tensile</td><td>ASTM D 4632</td><td>100 lbs. min.</td></tr> <tr> <td>Elongation (%)</td><td></td><td>30 % max.</td></tr> <tr> <td>Trapezoid Tear</td><td>ASTM D 4533</td><td>55 lbs. min.</td></tr> <tr> <td>Permittivity</td><td>ASTM D 4491</td><td>0.2 sec<sup>-1</sup></td></tr> <tr> <td>AOS (U.S. Std Sieve)</td><td>ASTM D 4751</td><td>20-100</td></tr> </table> <p><b>Silt Fence Stakes and Posts</b></p> <ul style="list-style-type: none"> <li>The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when hardwood is used and 4 inches by 4 inches when softwood is used, and shall have a minimum length of 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.</li> </ul> <p><b>Identification Storage and Handling</b></p> <ul style="list-style-type: none"> <li>Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873.</li> </ul>	FILTER FABRIC FOR SILT SCREEN FENCE			<u>Physical Property</u>	<u>Test Procedure</u>	<u>Strength Requirement</u>	Grab Tensile	ASTM D 4632	100 lbs. min.	Elongation (%)		30 % max.	Trapezoid Tear	ASTM D 4533	55 lbs. min.	Permittivity	ASTM D 4491	0.2 sec <sup>-1</sup>	AOS (U.S. Std Sieve)	ASTM D 4751	20-100	
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Topic	Mitigation Measure	Responsibility
<b>HYDROLOGY AND WATER QUALITY (cont.)</b>		
<b>MM-HYD-1</b> Stormwater Pollution Prevention Plan (cont.)	<p><b>Maintenance</b></p> <ul style="list-style-type: none"> <li>The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.</li> <li>Silt fences shall be inspected in accordance with the below paragraph, Inspections. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed with approval of COR. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade.</li> <li>Diversion dikes shall be inspected in accordance with the below paragraph, Inspections. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade.</li> </ul> <p><b>Inspections</b></p> <ul style="list-style-type: none"> <li>The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every 7 calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.</li> <li>Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.</li> <li>For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the COR within 24 hours of the inspection as a part of the Contractor's daily CQC Report. A copy of the inspection report shall be maintained on the job site.</li> </ul>	
<b>MM-HYD-2</b> Non-Hazardous Liquid Waste Management	<p>Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related wastewater off Government property in accordance with all Federal, State, Regional and Local laws and regulations.</p> <p>Water contaminated with silt, grout, or other construction by-product must be pumped to a holding tank. Location of the holding tank will be proposed by Contractor and approved by Contracting Officer.</p>	Contractor

Topic	Mitigation Measure	Responsibility
<b>HYDROLOGY AND WATER QUALITY (cont.)</b>		
<b>MM-HYD-3</b> Hazardous Materials and Wastes	<ul style="list-style-type: none"> <li>Identify potentially hazardous substances to be used on the job site.</li> <li>Identify handling procedures to ensure that hazardous substances are not released into the air, water, or ground.</li> <li>Comply with Federal, State, and local laws and regulations for storage, handling, and disposal of these materials.</li> <li>Storage of hazardous or flammable chemicals in the staging area or elsewhere on the site is prohibited except as approved by the Contracting Officer.</li> <li>Hazardous materials shall not be discarded into the jobsite debris or waste-disposal facilities.</li> <li>Empty containers shall be removed from the site and disposed of in a manner prescribed by law.</li> <li>Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.</li> <li>A copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time is to be maintained on site and submitted to the Contracting Officer.</li> <li>Before new hazardous materials are brought on site or removed from the site, the MSDS file shall be updated and submitted to the Contracting Officer.</li> </ul>	Contractor
<b>MM-HYD-4</b> Spill Prevention and Response Plan (SPRP)	<p>The California Regional Water Quality Control Board has issued a Cleanup and Abatement Order and Time Schedule Order to Yosemite National Park ordering that no sewage spills occur. The Contractor shall be required to follow the requirements of the Order and shall prepare a Spill Prevention and Response Plan and take appropriate spill prevention measures during all phases of the work. The California Regional Water Quality Control Board requires a minimum of 10 days to review the SPRP. All recommendations by the Board will be implemented at no additional cost to the NPS.</p> <p>The primary purpose of the SPRP is to prevent sewage spills from occurring by proper planning and protection of the project area, and then to respond to any sewage spills that may occur during the course of this project including appropriate notification of staff. The Plan will be general in nature and typical to all phases of the work with site specific plans required for each area involving trenching or any work with the possibility of accessing the existing system. The sewer lines are located throughout Yosemite Valley and in close proximity to waterways and stream channels such that spilled sewage could possibly reach the Merced River.</p> <p>The SPRP is structured in two parts – first a Spill Prevention Plan and then a Spill Response Plan. The Spill Prevention Plan (SPP) includes evaluation of specific conditions, set-up of containment for actual construction work as well as for bypass pumping. Sewer bypasses must be constructed to tie existing lines into the new system and to tie the new system into the existing system. The Spill Response Plan (SRP) includes the initial response to stop and contain a spill, notification of staff, clean-up, and follow-up documentation. The SPP and the SRP together comprise the entire SPRP. A template of a plan follows at the end of this Section. An electronic version of this template will be provided to the successful bidder.</p> <p>All Contractor employees are required to be trained in the Spill Prevention Control in accordance with this SPRP.</p>	Contractor

Topic	Mitigation Measure	Responsibility
<b>HYDROLOGY AND WATER QUALITY (cont.)</b>		
<b>MM-HYD-5</b> Hazardous Materials Spill Prevention and Response Plan	<p>Contractor shall provide a Hazardous Materials Spill Prevention and Response Plan to address spill prevention and response measures for hazardous substances used on site, including fuels. Prior to the start of work, the Contractor shall submit a plan that complies with YNP, Federal and State requirements and allows contractors to properly notify officials in the event of an emergency occurring during construction activities. YNP requirements include, and the plan shall state, at a minimum:</p> <ul style="list-style-type: none"> <li>• During non-work operations, stationary equipment shall be parked over specially prepared containment pads designed to trap any leaking oil, fuel, or hydraulic fluids.</li> <li>• Inspect construction site daily for proper storage of hazardous materials, proper parking of equipment on containment pads, and for hydraulic and oil leaks of equipment, tighten hoses, and ensure they are in good condition.</li> <li>• Routine oiling and lubrication shall be conducted in areas with secondary containment using Best Management Practices (BMPs) at all times. Refueling of equipment in wetlands or stream channel areas is not allowed at any time.</li> <li>• Contractor shall maintain secondary containment for all equipment operating with fluids (such as drilling) or when direct discharge of leakage, spills, or other source of construction or equipment fluids can flow directly to any streambed, whether flowing with water or dry. Containment shall be designed and installed so as to prevent accidental spills into streambeds in the event of mechanical failure or hose breakage.</li> <li>• Contractor shall maintain spill response materials on the project site when using heavy equipment to ensure rapid response to small spills. These materials shall include absorbent pads, booms, or other materials as appropriate to contain oil, hydraulic fluid, solvents, and hazardous material spills. A list of the spill response materials to be kept on site shall be submitted to the Contracting Officer.</li> <li>• Contractor shall provide names and phone numbers of appropriate contractor's personnel to be contacted at any time (24 hours per day) regarding accidental release of hazardous substances to air, soil or water. This list shall be submitted to the Contracting Officer and a copy visibly displayed in work areas on site.</li> <li>• Contractor shall have the Contracting Officer's and other appropriate Government emergency numbers posted and shall immediately notify the Contracting Officer or other Government representative on any accidental release of hazardous substances to air, soil or water.</li> <li>• Hazardous or flammable chemicals shall be prohibited from storage in the staging area, except for those substances identified in the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan. Hazardous waste materials shall be immediately removed from project site in approved containers.</li> <li>• Comply with all applicable regulations and policies during the removal and remediation of asbestos, lead paint, and polychlorinated biphenyls.</li> </ul>	Contractor

Topic	Mitigation Measure	Responsibility
<b>VEGETATION AND WETLANDS</b>		
<b>MM-VEG-1</b> Protection from Exotic Plant Species:	<p>The park and contractor shall undertake measures to prevent the introduction of exotic species in the project area and staging areas. All earth moving equipment must enter the Park free of dirt, dust, mud, seeds, or other potential contaminant. Equipment exhibiting any dirt or other material attached to frame, tires, wheels, or other parts shall be thoroughly cleaned by the Contractor before entering the Park.</p> <p>All equipment will be directed to the El Portal Maintenance Facility for inspection prior to commencing work. Areas inspected shall include, but not be limited to, tracks, track guard/housings, belly pans/under covers, buckets, rippers, and other attachments.</p> <p>Equipment that does not pass inspection will be turned around to the nearest cleaning facility outside the park. If vehicles are unable to drive to El Portal due to size or load restrictions, vehicles will be inspected at a mutually agreed site by the Contracting Officer prior to entering the Park. The Contractor shall notify the Construction manager at least two work days (not including weekends) prior to bringing any equipment into the Park. Equipment found to have entered the Park with potential contaminants will be removed from the Park at the direction of the Contracting Officer at Contractor's sole expense.</p> <p>Contractor shall minimize ground disturbance to the greatest extent possible.</p> <p>The contractor shall get approval in writing from the Contracting Officer for fill material that must be used in a way or stored in a location not clearly specified in the contract.</p> <p>Fill materials used within the top 12 inches of finished grade are required to be free of exotic and noxious weed species and shall have the source locations approved by the Contracting Officer. The Contractor shall submit to the Contracting Officer a list of proposed sources for imported fill materials requiring certification 30 calendar days in advance of importing material. The presence of noxious weed species is grounds for rejection of the source.</p> <p>If exotic weed species are found or suspected, the Contractor may be required to strip the top 12 inches of source material and only import sub-surface material and/or sterilize the material, at the Contracting Officer's discretion. The presence of the following particularly noxious weed species are grounds for rejection of the source: spotted knapweed, yellow star-thistle, perennial pepperweed, broom species, and other species on the California State List of Noxious Weeds. If spraying is required, the Contractor shall provide a licensed operator to spray according to applicable state regulations and park management guidelines (e.g., the Invasive Species Management Plan). The Contractor shall not spray any herbicides until approved in writing by the Contracting Officer.</p> <p>Drain and flush all pumps, tanks, live wells, buckets and other containers that might carry water contaminated with exotic plants and animals, such as the zebra mussel, prior to bringing equipment into the park. Thoroughly wash all hauling tanks and equipment using a hard spray from a garden hose. If equipment was used in infested waters, use the following steps to clean the equipment:</p> <ul style="list-style-type: none"> <li>• Wash with hot water (140 F or 40 C) or a high pressure washer (250 pounds per square inch). Remove all aquatic weeds -- they can carry zebra mussels.</li> <li>• Disinfect equipment. Recent research shows that disinfection of nets and equipment with benzalkonium chloride at typical treatment rates (10 milligrams per liter for 24 hours, 100 milligrams per liter for 3 hours, or 250 milligrams per liter for 15 minutes) will effectively eliminate most exotic animals. Two other commonly used disinfectants, calcium hypochlorite and iodine, are ineffective against zebra mussels.</li> </ul>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>VEGETATION AND WETLANDS (cont.)</b>		
<b>MM-VEG-1</b> Protection from Exotic Plant Species (cont.)	<ul style="list-style-type: none"> <li>Adult zebra mussels can live more than a week out of water in moist, shaded areas. Dry pumps, nets and other equipment used in infested waters in the sun for two to four days after cleaning. If adult mussels are present, dry equipment for two weeks.</li> </ul>	
<b>MM-VEG-2</b> Vegetation Inventory and Assessment	<p>Plant Condition Inventory: The Contractor and the Contracting Officer or designated representative, shall perform an on-site inventory of trees and other overall vegetation features within or near to the work limits. A print of the contract drawings showing tree locations and a photo record will be used to note condition of trees and vegetation. This annotated drawing will be retained by the Contracting Officer for use during the final walk-through and tree/vegetation assessment. This walk through shall be a part of the project closeout requirements (see Section 01770, Project Closeout).</p> <p>On-site inventory shall be scheduled in coordination with the pre-construction conference.</p> <p>Access to work sites requiring travel through undeveloped areas outside the work limits must be approved by the contracting officer.</p> <p>Provide temporary barriers (e.g., orange construction fence) to protect existing trees, plants and critical root zones that are designated to remain, but are: (1) within the construction limits; 2) on or just outside the construction limits; (3) within the clearing limits (i.e., the zone extending 5 feet beyond the staked construction limits); or (4) on, or just outside the clearing limit line. Barriers shall be in place before construction begins.</p> <p>Trees, shrubs, vines, grasses, and other vegetative features indicated and defined on the Drawings to be preserved shall be clearly identified by marking, fencing, or any other approved techniques. The Contractor shall restore vegetative features damaged or destroyed during construction operations outside the limits of the approved work area.</p> <p>Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy resources including trees, shrubs, vines, grasses, topsoil, and landforms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized.</p> <p>Removal of trees will be performed by YNP in advance of Contractor's work. Should it be determined during the course of work that additional trees or tree roots require removal, Contractor shall notify the Contracting Officer who will coordinate an inspection and determination by the appropriate authorities whether to remove the tree or not.</p> <p>After tree removal, large roots may remain in the ground. Contractor shall be responsible for carefully removing in-ground tree roots of removed trees to permit excavation, drilling, or other ground penetrating construction activities. During tree root removal, do not use backhoes, chains, or other equipment in a manner that will harm roots of adjacent trees.</p> <p>Minimize disturbance to tree trunks and root zones to prevent damage to trees.</p> <p>Adjust trenches and other excavations to keep them beyond the drip line wherever possible.</p> <p>Attempt to maintain the following minimum clearances between the edges of tree trunks and excavation:</p> <ul style="list-style-type: none"> <li>for trees more than 30-inch-in-diameter - 10 feet</li> </ul>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>VEGETATION AND WETLANDS (cont.)</b>		
<b>MM-VEG-2</b> Vegetation Inventory and Assessment (cont.)	<ul style="list-style-type: none"> <li>• for trees between 15-inch and 30-inch-in-diameter - 8 feet</li> <li>• for trees less than 15-inch-in-diameter - 5 feet</li> </ul> <p>Adjust the survey line, as necessary to maintain required clearances.</p> <p>Notify the Contracting Officer of any proposed trenches or other excavations within the drip line of trees.</p> <p>Steps to Mitigate Damage to Roots Due to Excavation:</p> <p>Take steps (as called for below) to mitigate damage to tree roots due to excavation, wherever the following circumstances apply:</p> <ul style="list-style-type: none"> <li>• Wherever excavation must take place within the drip line of oak trees regardless of diameter.</li> <li>• Wherever excavation must take place within the drip line of trees other than oaks, for all trees 12 inches or larger in diameter.</li> </ul> <p>Trees which are anticipated to meet these criteria and therefore require steps to mitigate damage to roots due to excavation are shown on the drawings. Adjustments in trench alignment or other factors may result in variations in which trees are affected. The Contractor shall accommodate these variations at no additional expense to the Government.</p> <p>Following are the steps which are required to mitigate damage to roots due to excavation:</p> <ul style="list-style-type: none"> <li>• Excavate carefully where tree roots might be encountered. Where roots 2 inches and larger are encountered, hand excavate as required to prevent damage to roots. Tunnel under roots to be saved, hand excavating as necessary.</li> <li>• Do not cut roots over 2-inch-in-diameter without approval of Contracting Officer.</li> <li>• Cleanly saw-cut roots between 1-inch and 2-inch-in-diameter where they interfere with work; do not cut roots except as necessary. Roots between 1-inch and 2-inch-in-diameter which must be cut shall be cleanly saw-cut near the edge of trench closest to the tree to prevent roots from being dislodged from soil by equipment.</li> <li>• Avoid soil compaction within plant root zones with heavy equipment and vehicles within the project work limits.</li> <li>• Do not cut wheels or make sharp turns with wheeled or tracked equipment in root zones.</li> <li>• Do not pile excavated soil against tree trunks.</li> <li>• Do not mechanically compact soils in undeveloped areas except to meet minimum compaction requirements as approved by the contracting officer.</li> <li>• Maintain original soil topography in plant root zones whenever possible.</li> </ul> <p>Preserve tree snags where feasible as potential bat or bird habitat.</p>	

Topic	Mitigation Measure	Responsibility
<b>VEGETATION AND WETLANDS (cont.)</b>		
<b>MM-VEG-3</b> Plant Appraisal	<p>If the Contractor destroys or injures trees and vegetation designated for protection or outside the work limits, the Contractor will be assessed damages prior to final progress payment.</p> <p>Replacement costs for damaged vegetation will be computed according to the method described in the International Society of Arboriculture's 1992 Guide for Plant Appraisal. This method is based on the cost of the largest commonly available tree or shrub, with modifications based on species value, condition, and location. A trained arborist or professional plant appraiser from the California region will be hired by the NPS to make the damage appraisal. The arborist's fees will be included in the damage assessment.</p> <p>This damage appraisal process will be triggered by any of the following types of damage to vegetation outside the work limits or unauthorized disturbance of vegetation within the work limits.</p> <ul style="list-style-type: none"> <li>• Removal of any tree or shrub.</li> <li>• Pruning or removal of more than 30 percent of a tree or shrub canopy.</li> <li>• Removal or fracture of any limb or trunk that is one of the major structural entities of the damaged plant.</li> <li>• Removal or fracture of any limb greater than 12 inches in diameter.</li> <li>• Bark damage or removal around more than 30 percent of the trunk circumference.</li> <li>• Trenching or soil disturbance within the critical root zone that is deeper than 1-foot unless shown on the Drawings.</li> </ul> <p>If the damaged vegetation is protected under the Endangered Species Act or other special legislation, additional penalties may be assessed as per consultation with the U.S. Fish &amp; Wildlife Service.</p> <p>Pruning or removal of vegetation shall be supervised by Contracting Officer. The designated personnel may designate plant species for salvage. When authorized and supervised by the Contracting Officer, the Contractor is exempted from any penalties that might be assessed due to damage to vegetation.</p> <ul style="list-style-type: none"> <li>• Acceptable disturbance to roots is limited to 15 percent of the area under the drip line being either cut or filled. Any tree with more than 50 percent of its roots disturbed should be removed during construction at the direction of the Contracting Officer.</li> <li>• Wounds occurring from construction activity may be possible entry sites for disease spores. If a tree is accidentally injured during construction, it may need to be removed at the direction of the Contracting Officer.</li> </ul> <p>Trench alignments or other factors may result in variations in which trees are affected. The Contractor shall accommodate these variations at no additional expense to the Government.</p> <p>Minor cuts and damaged areas shall be assessed by the Contracting Officer. Repair to the plant will be at the recommendation of the YNP personnel and approval of the Contracting Officer.</p>	Yosemite National Park; Contractor



Topic	Mitigation Measure	Responsibility
<b>VEGETATION AND WETLANDS (cont.)</b>		
<b>MM-VEG-4</b> Wetlands Delineation	Delineate wetlands and apply protection measures during construction. Wetlands shall be delineated by qualified National Park Service staff or certified wetland specialists and clearly marked prior to work. Perform activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.	Yosemite National Park; Contractor
<b>MM-VEG-5</b> Wetlands Regulation	<p>The Contractor shall adhere at all times to the conditions of U.S. Army Corps of Engineers Nationwide Permit No. 33, Temporary Construction, Access and Dewatering, with the following conditions as a minimum:</p> <ul style="list-style-type: none"> <li>• All work will be subject to the Standard and Technical Conditions of the Certification of the California Regional Water Quality Control Board, a copy which will be provided to the Contractor.</li> <li>• Work in streambeds is to be performed in periods of low water conditions. Contractor shall monitor stream flow conditions and weather forecasts at all times during the course of the work. During thunderstorms or other intense rain conditions, streambeds at Yosemite can fill rapidly.</li> </ul> <p>Re-grade and restore disturbed areas to preexisting contours to maintain drainage patterns.</p>	Contractor
<b>MM-VEG-6</b> Wetlands Protection	<p>The Contractor shall fence construction areas adjacent to aquatic habitats to prohibit the movement of aquatic species into the construction area and to control siltation and disturbance in aquatic habitats.</p> <p>The Contractor shall salvage and reuse wetland soils as fill to the maximum extent possible.</p> <p>The Contractor shall use trench plugs where designated on the drawings in wetland areas to prevent changes to natural flow patterns.</p> <p>During dewatering, intakes shall be completely screened with wire mesh not larger than 5 millimeters to prevent aquatic species from entering the pump system. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction.</p> <p>Access routes to and through work locations in the meadows and wetlands shall be planked with 1 1/8" plywood, stabilization mats or other method approved by the contracting officer.</p>	Yosemite National Park, Project Manager; Contractor
<b>MM-VEG-7</b> Monitoring	Ongoing monitoring undertaken by Yosemite's interdisciplinary Visitor Use and Impacts Monitoring Program regularly assesses conditions in meadows and along riverbanks, providing important information on the success of restoration efforts. In addition, the park performs regular monitoring for invasive plants, stock use impacts, wildlife abundance and diversity, and visitor experience. To evaluate the success of particular restoration actions, monitoring plans will be implemented specific to each restoration project. Geophysical and biological parameters will be monitored over time to determine restoration success and recovery rates. Pre and post-restoration vegetation and soil sampling and photo points are examples of monitoring to measure project success.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>WILDLIFE AND SPECIAL STATUS SPECIES</b>		
<b>MM-WL-1</b> Fish and Wildlife Protection	<p>The Contractor and Contractor's employees shall not feed any animals within Yosemite National Park.</p> <p>The Contractor shall make all reasonable efforts in accordance with the plans and specifications for the protection of threatened or endangered or candidate species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.</p> <p>Contractor shall schedule construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods (i.e., after bird nesting seasons, when bats are neither hibernating nor have young, etc); limit the effects of light and noise on adjacent habitat through controls on construction equipment; and provide adequate education and enforcement to limit construction worker activities that are destructive to wildlife and habitats.</p> <p>Contractor shall maintain routes of escape from excavated pits and trenches for animals that might fall in. During construction activities, Contractor personnel shall maintain vigilance for animals caught in excavations and take appropriate action to free them.</p> <ul style="list-style-type: none"> <li>Excavation pits shall have a ramp or incline at either end to allow for human and wildlife escape.</li> <li>Each morning prior to commencing work activities, Contractor shall inspect construction site for trapped wildlife in excavation pits and carefully remove. If necessary, contact the Contracting Officer for assistance.</li> </ul>	Yosemite National Park; Contractor
<b>MM-WL-2</b> Bear Precautions	<p>Bears may be present at any location within the YNP boundaries, including at the project site. The Contractor shall incorporate the following precautions in all activities within the YNP boundary.</p> <p>All food, toiletries, and scented items (i.e., bug spray) shall be placed in bear boxes at the construction site provided by the Contractor. Bear boxes must remain closed and latched at all times, unless items are being retrieved. No food, toiletries, or scented items shall be stored in vehicles or left out.</p> <ul style="list-style-type: none"> <li>All food waste and food-related waste shall be disposed of in accordance with Non-Hazardous Solid Wastes requirements described elsewhere within this section.</li> <li>All vehicles shall be checked daily to ensure that no items that may attract bears remain inside an unattended vehicle. Items that shall not be left in vehicles include canned food, drinks, soap, cosmetics, toiletries, domestic trash, recyclable food containers, ice chests, grocery bags, and unwashed items used for preparing or eating meals.</li> <li>All windows and doors in recreational vehicles or trailers used for lodging or office space shall be closed and latched when not occupied.</li> <li>The Contractor shall walk the job site at the end of each day and check for trash, food, and food-related items remaining at the site and dispose of the items in a bear-proof receptacle.</li> <li>Proper food storage is important to the welfare of the Yosemite bear population and is required by law. The Contractor shall receive and all Contractor personnel shall read a brochure entitled, The Bears are not to Blame, provided by NPS staff as a courtesy. Contractor staff shall call the Save-a-Bear hotline (209) 372-0322 to report overflowing trash containers, improperly stored food, or bear sightings.</li> </ul>	Contractor

Topic	Mitigation Measure	Responsibility
<b>WILDLIFE AND SPECIAL STATUS SPECIES (cont.)</b>		
<b>MM-WL-3</b> Special Status Plant Species	<p>If special-status plant species are identified within the construction disturbance zone, in particular within restoration and revegetation areas, avoid special-status plant populations to the extent feasible during construction activities.</p> <p>If it is not feasible for construction activities to avoid special status plant species, species conservation measures will be developed in coordination with Yosemite National Park natural resources staff. Measures may include salvage of special-status plants for use in revegetating disturbed areas and transplantation of special-status plants wherever possible using methods and monitoring identified in the revegetation plan, monitoring to ensure successful revegetation, protection of plantings, and replacement of unsuccessful plant materials if practicable.</p>	Yosemite National Park; Contractor
<b>MM-WL-4</b> Elderberry Longhorn Beetle Conservation Guidelines	Yosemite National Park and Contractor shall adhere to the "Conservation Guidelines for the Valley Elderberry Longhorn Beetle" (USFWS 1999) to avoid and minimize adverse impacts on the federally listed valley elderberry longhorn beetle. The guidelines specify avoidance and protection measures; transplantation specifications; requirements for planting additional seedlings, cuttings, and associated native species; monitoring; and reporting. Establish an estimated 1.53 acre conservation area at the Greenemeyer Sand Pit for elderberry shrubs and required additional species, pending specifications of U.S. Fish and Wildlife Service Biological Opinion for the final Merced River Plan/EIS.	Yosemite National Park; Contractor
<b>MM-WL-5</b> Construction Timing	Schedule construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods (i.e., after bird nesting seasons, when bats are neither hibernating nor have young, etc).	Yosemite National Park; Contractor
<b>MM-WL-6</b> Bat Habitat Protection Guidelines	<p>A qualified bat biologist will conduct surveys prior to construction to evaluate whether habitat that will be affected by the proposed action provide hibernacula or nursery colony roosting habitat for bat species.</p> <p>If bats are detected during reproduction or hibernation periods, disturbance of potential habitat will be delayed until the bats can be excluded from the area in a manner that does not adversely affect their survival or that of their young.</p> <p>If bats are detected during reproduction or hibernation periods, disturbance of potential habitat will be delayed until the bats can be excluded from the area in a manner that does not adversely affect their survival or that of their young.</p> <p>If surveys conducted immediately prior to construction do not reveal any bat species present within the project area, then the action will begin within three days to prevent the destruction of any bats that could move into the area after the survey.</p>	Yosemite National Park; Contractor
<b>MM-WL-7</b> Bird Habitat Protection Guidelines	<p>Beginning in early spring, a park wildlife biologist will conduct bird surveys and review current owl reports to determine whether special status species are present and may be mating, nesting, or foraging in the project vicinity.</p> <p>If nesting birds are observed (e.g., discovered by workers) that are not special status species, the project manager will notify the park wildlife biologist who will recommend steps to avoid undesirable impacts to the nest or young.</p>	Yosemite National Park, Project Manager

Topic	Mitigation Measure	Responsibility
<b>LIGHTSCAPES</b>		
<b>MM-LITE-1</b> Yosemite Lighting Guidelines	All new sources of lighting, or substantial modifications to structures with existing sources of exterior lighting, shall conform to the standards set forth in the Yosemite Lighting Guidelines, available on the park's website at: <a href="http://www.nps.gov/yose/naturescience/dark-night-sky.htm">http://www.nps.gov/yose/naturescience/dark-night-sky.htm</a> .	Yosemite National Park; Contractor
<b>MM-LITE-2</b> Night Lighting During Construction	Minimize night lighting during work. If night lighting is necessary, design lighting to be minimal, directed downward, and shielded.	Yosemite National Park; Contractor
<b>SOUNDSCAPES</b>		
<b>MM-NOI-1</b> Construction Work Plan and Schedule	<p>Contractor shall submit to the park for review and approval prior to commencement of construction a construction work plan/schedule that specifies the ways in which the contractor will minimize construction-related noise in noise-sensitive areas. At a minimum, the plan shall state the following:</p> <ul style="list-style-type: none"> <li>• Ensure that all construction equipment has functional exhaust muffler systems.</li> <li>• Use hydraulically or electrically powered construction equipment, when feasible.</li> <li>• Locate stationary noise sources as far from sensitive receptors as possible.</li> <li>• Limit the idling of motors except as necessary (e.g., concrete mixing trucks).</li> <li>• A construction schedule that minimizes impacts to adjacent noise-sensitive activities.</li> <li>• Engine braking ("jake" brakes) shall not be used in lodging, camping or residential areas. Engine brakes that are used shall be muffled.</li> <li>• Continuous noise abatement is required to prevent disturbance and nuisance to Park visitors and workers and to the occupants of adjacent premises and surrounding areas.</li> <li>• If the Contracting Officer determines excessive noise is emanating from the construction site, the Contractor may be required to provide sound barriers to deflect noise transmission from visitor areas or other areas impacted by noise.</li> </ul> <p>Construction noise shall be minimized through use of best available noise control techniques wherever feasible. Sound levels must be kept to a minimum at all times. Equipment and machinery shall not exceed 85 db when measured at 100 linear feet distance. Contractor shall use sound attenuated compressors and generators that comply with the most recent California Department of Transportation standards.</p>	Contractor

Topic	Mitigation Measure	Responsibility																																																										
SOUNDSCAPES (cont.)																																																												
MM-NOI-2  Noise Management Levels	<p>Contractor shall ensure that all construction equipment and practices adhere to the following noise limitations:</p> <p>Repetitive and/or intermittent, high-level noise: Permitted only during Daytime.</p> <p>Do not exceed the following dB(A) limitations at 50 feet:</p> <table><thead><tr><th><u>Sound Level in dB(A)</u></th><th><u>Time Duration of Impact Noise</u></th></tr></thead><tbody><tr><td>70</td><td>More than 12 minutes in any hour</td></tr><tr><td>80</td><td>More than 3 minutes in any hour</td></tr></tbody></table> <p>Maximum permissible construction equipment noise levels at 50 feet:</p> <table><thead><tr><th><u>Earthmoving</u></th><th><u>dB(A)</u></th><th><u>Materials Handling</u></th><th><u>dB(A)</u></th></tr></thead><tbody><tr><td>Front Loaders</td><td>75</td><td>Concrete Mixers</td><td>75</td></tr><tr><td>Backhoes</td><td>75</td><td>Concrete Pumps</td><td>75</td></tr><tr><td>Dozers</td><td>75</td><td>Cranes</td><td>75</td></tr><tr><td>Tractors</td><td>75</td><td>Derricks Impact</td><td>75</td></tr><tr><td>Scrapers</td><td>80</td><td>Pile Drivers</td><td>95</td></tr><tr><td>Graders</td><td>75</td><td>Jack Hammers</td><td>75</td></tr><tr><td>Trucks</td><td>75</td><td>Rock Drills</td><td>80</td></tr><tr><td>Pavers, Stationary</td><td>80</td><td>Pneumatic Tools</td><td>80</td></tr><tr><td>Pumps</td><td>75</td><td>Saws</td><td>75</td></tr><tr><td>Generators</td><td>75</td><td>Vibrators</td><td>75</td></tr><tr><td>Compressors</td><td>75</td><td></td><td></td></tr></tbody></table> <p><i>Ambient Noise:</i></p> <p>Maximum noise levels (dB) for receiving noise area at property line shall be as follows:</p> <table><tbody><tr><td>Residential receiving area</td><td>Daytime: 65 dB Nighttime: 45 dB</td></tr><tr><td>Commercial/Industrial receiving area</td><td>Daytime: 67 dB Nighttime: 65 dB</td></tr></tbody></table> <p>In the event the existing local ambient noise level exceeds the maximum allowable receiving noise level (dB), the receiving noise level maximum for construction operations shall be adjusted as follows:</p> <p>Residential receiving area: Maximum 3 additional dB above the local ambient as measured at property line.</p> <p>Commercial/Industrial receiving area: Maximum 5 additional dB above the local ambient as measured at the property line.</p>	<u>Sound Level in dB(A)</u>	<u>Time Duration of Impact Noise</u>	70	More than 12 minutes in any hour	80	More than 3 minutes in any hour	<u>Earthmoving</u>	<u>dB(A)</u>	<u>Materials Handling</u>	<u>dB(A)</u>	Front Loaders	75	Concrete Mixers	75	Backhoes	75	Concrete Pumps	75	Dozers	75	Cranes	75	Tractors	75	Derricks Impact	75	Scrapers	80	Pile Drivers	95	Graders	75	Jack Hammers	75	Trucks	75	Rock Drills	80	Pavers, Stationary	80	Pneumatic Tools	80	Pumps	75	Saws	75	Generators	75	Vibrators	75	Compressors	75			Residential receiving area	Daytime: 65 dB Nighttime: 45 dB	Commercial/Industrial receiving area	Daytime: 67 dB Nighttime: 65 dB	Contractor
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Topic	Mitigation Measure	Responsibility
<b>SOUNDSCAPES (cont.)</b>		
<b>MM-NOI-3</b> Field Quality Control	<p>Contractor shall assess potential effects of construction noise on adjacent neighbors or facility occupants in accordance with ASTM E1686 and as follows:</p> <p>Ambient noise measurement: Measure at the property line at a height of at least four (4) feet above the immediate surrounding surface. Average the ambient noise level over a period of at least 15 minutes.</p> <p>Ambient noise measurement at urban sites: Conduct during morning peak traffic hour between 7 A.M. and 9 A.M. and afternoon peak traffic hour between 4 P.M. and 6 P.M. In addition, conduct a 24-hour measurement at the proposed project site to document the noise pattern throughout the day. Adjust and weight for seasonal and climatic variations.</p> <p>Monitor noise produced from construction operations in accordance with ASTM E1780.</p>	Contractor
<b>AIR QUALITY</b>		
<b>MM-AIR-1</b> Dust Abatement Program	<p>The Yosemite National Park and/or a contractor (as appropriate) shall prepare, implement, and comply with a dust abatement program during construction. Measures include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Water or apply soil stabilizers to disturbed areas;</li> <li>• When hauling dry materials, securely cover truck beds to prevent blowing dust or loss of debris;</li> <li>• Limit speeds to a maximum of 15 mph within construction areas. Slower speeds shall be maintained if necessary to reduce dust formation.</li> <li>• Minimize vegetation clearing;</li> <li>• Re-vegetate disturbed areas post construction;</li> <li>• At construction zone access points, prevent paved areas from accumulating mud, soils, and other organic materials.</li> </ul>	Yosemite National Park; Contractor
<b>MM-AIR-2</b> Equipment Exhaust Controls	<p>The Yosemite National Park and/or a contractor (as appropriate) shall prepare, implement, and comply with equipment exhaust controls program during construction. Measures include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to two minutes. Clear signage shall be provided for construction workers at all access points;</li> <li>• Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM;</li> <li>• Require all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines;</li> <li>• Require all equipment operations to occur during daytime hours to minimize effects of local inversions;</li> <li>• Equipment operations shall be in accordance with all Federal and State air emission and performance laws and standards.</li> <li>• Vehicles or equipment with excessive emissions or discharging black smoke will be removed from operation immediately and may not be used until appropriate maintenance and repairs have corrected the emissions problem.</li> </ul>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>VISITOR EXPERIENCE</b>		
<b>MM-VEX-1</b> Non-Hazardous Solid Waste Management Measures	<p>Waste, trash, and debris shall be controlled at all times and disposed in authorized containers in the Contractor's staging area.</p> <p>All sanitary waste (garbage) must be disposed of in approved, bear-proof disposal bins. Provide lockable, bear-proof dumpsters with lids for waste (garbage) storage. Lids shall be equipped with carabineers/heavy wire lid locks. Verify that dumpster lids are secure at close of work each day.</p> <p>Construction debris (rubbish) may be stored in unlidded dumpsters or construction debris truck/trailers and removed on a regular basis. Do not mingle sanitary or green waste with construction debris.</p> <p>All large, normally open top, waste bins or dumpsters shall be lidded and clearly marked "No Food or Trash".</p> <p>All construction personnel shall adhere to park regulations concerning food storage and refuse management.</p> <p>The Contractor shall designate an employee to police the work site daily for waste, wrappers, food packaging and the like. All waste shall be picked up and disposed of in lidded bear-proof dumpsters.</p> <p>Green waste shall be segregated from other non-green waste for processing at disposal site.</p> <p>Burying or burning of trash and debris on-site is not permitted. All un-used materials, trash, and debris shall be the property of the Contractor and shall be transported outside of the YNP boundary for disposal in accordance with law.</p> <p>Remove debris from permanently closed spaces prior to enclosing them.</p> <p>Properly secure trash during the workday and remove all trash from site at the end of each workday</p>	Yosemite National Park; Contractor
<b>MM-VEX-2</b> Scenic Resource Protection	<p>Fence construction staging areas and construction activity areas to visually screen construction activity and materials.</p> <p>Consolidate construction equipment and materials to the staging areas at the end of each work day to limit the visual intrusion of construction equipment during nonwork hours.</p>	Yosemite National Park; Contractor
<b>TRANSPORTATION</b>		
<b>MM-TRA-1</b> Traffic Control Plan	<p>Contractor shall prepare a Traffic Control Plan. This plan shall include but not be limited to the following:</p> <ul style="list-style-type: none"> <li>• Maps showing how any detour routes will be signed and controlled.</li> <li>• Submission of specific street closure and detour plans for each segment of the project no less than 3 weeks prior to beginning construction on any segment.</li> <li>• Description of how Contractor shall provide for the protection of pedestrians and bicyclists, and safe vehicle passage through the use of signs and flagpersons. In addition, address how access for emergency vehicles, chain-up areas and snow plow turn around areas, police, rangers, fire and disaster units shall be maintained at all times.</li> <li>• Show how any detour routes will be signed and controlled. Furnish and install all signs. Provide flagpersons as required.</li> <li>• Revise and update the Traffic Control Plan to reflect changes in the project schedule or sequence of work, as required.</li> </ul>	Contractor

Topic	Mitigation Measure	Responsibility
<b>TRANSPORTATION (cont.)</b>		
<b>MM-TRA-1</b> Traffic Control Plan (cont.)	<ul style="list-style-type: none"> <li>Show measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud and dust transported onto paved public roads by vehicles or runoff.</li> <li>Revise and update specific Traffic Control Plan to reflect changes in the project schedule as required, or to accommodate the traffic control plans of other projects concurrently under construction in the project vicinity or the Yosemite Valley.</li> </ul> <p>The YNP Project Manager will provide temporary traffic routing and control information from other on-going or planned projects that may affect the Contractor's Traffic Control Plan. The Contractor shall accommodate the information from these other traffic control plans as necessary and bring any conflicts to the attention of the COR immediately.</p>	
<b>MM-TRA-2</b> Road Closure Traffic Control and Detour Plans contents.	<p>Prepare and submit specific Road Closure Traffic Control and Detour Plans for each area of the project not less than 3 weeks before beginning construction on any segment. Provide for the following:</p> <ul style="list-style-type: none"> <li>Temporary closure of both lanes of traffic (subject to the requirements listed herein) shall be limited to periods of 20 minutes maximum. Requests for additional closure periods shall be submitted in writing to the Contracting Officer a minimum of 7 days prior to any planned road closures.</li> <li>Single lane traffic diversions shall comply with the detail in "Traffic Control System for Two Lane Conventional State Highways" in California Department of Transportation Standard Specifications, Section 02201, Paragraph 1.1 D.</li> </ul>	Contractor
<b>MM-TRA-3</b> Traffic Control Devices	<p>Traffic control devices shall be provided in sufficient quantities and types as required to provide safe and adequate traffic control.</p> <p>During hours of darkness, approved lights and/or flares shall be included, in proper working order, to illuminate signs and hazards and alert approaching traffic.</p> <p>Barricades shall be furnished and maintained along all open trenches in contact with traffic.</p> <p>No work may begin on any day or at any time before traffic control devices have been placed, test driven and, if required, adjusted and revised.</p> <p>All traffic control devices shall be placed in accordance with the Manual of Traffic Controls and favorably reviewed Traffic Control Plan.</p> <p>Locations of devices shall be adjusted to suit the conditions and circumstances of each detour situation. In all cases, signs shall be placed to most effectively convey their messages to approaching traffic.</p> <p>Immediately after traffic control devices have been placed, the detour shall be test driven by the COR and Contractor's representative.</p> <p>Test drive shall include approach to the detour from each possible direction and traversing full length of each detour route.</p> <p>The Contractor shall adjust and revise all traffic control devices as determined to be required by test drive through and shall repeat test drive if determined necessary by the COR.</p> <p>The Contractor shall provide additional traffic control devices if required to maintain flow of traffic through construction operation.</p>	Contractor



Topic	Mitigation Measure	Responsibility
<b>TRANSPORTATION (cont.)</b>		
<b>MM-TRA-3</b> Traffic Control Devices (cont.)	<p>The Contractor shall maintain all traffic control devices, at proper locations and in proper working order, at all times during construction operations and whenever a hazard resulting from Contractor's operations exists.</p> <p>The Contractor shall adjust and revise traffic control devices, placement, etc., to suit changing conditions around construction operations.</p> <p>Traffic control devices shall remain in place at all times required to alert approaching traffic of upcoming hazards.</p> <p>After hazard has been removed, all traffic control devices shall be removed. Signs shall be removed or their messages covered.</p>	
<b>MM-TRA-4</b> Traffic Control Flaggers	<p>The Contractor shall employ flaggers:</p> <ul style="list-style-type: none"> <li>As required for each specific detour.</li> <li>At all locations on a construction site where barricades and warning signs cannot control the moving traffic.</li> </ul> <p>Where flaggers are required, they shall be logically placed in relation to the equipment or operation so as to give adequate warning and shall be placed approximately 100 feet ahead of impact point.</p>	Contractor
<b>MM-TRA-4</b> Traffic Control Flaggers (cont.)	<p>A warning sign shall be placed ahead of the flagger reading: "Flagger Ahead." The distance between the sign and the flagger should be based on the average traffic speed, allowing approximately 50 feet for each 10 miles per hour.</p> <p>During hours of darkness, flagger stations shall be illuminated such that the flagger will be clearly visible to approaching traffic. Lights for illuminating the flagger station shall receive favorable review by the COR.</p> <p>The flagger shall be provided with and wear a red or orange warning garment when flagging. Flaggers shall be provided with approved hand signs and two way radios for communication.</p> <p>When flagging during hours of darkness, the flagger shall signal with a red light or flare and shall have a belt and suspender harness outside his garment fitted with reflectors or made from reflectorized cloth, unless the garment is well reflectorized in one of these ways.</p>	
<b>MM-TRA-5</b> Traffic Control and Maintenance	<p>Traffic control and construction operations shall conform to the requirements of California Department of Transportation Standard Specifications, Section 12, except as modified herein.</p> <p>The Contractor shall provide, install, and maintain all necessary signs, lights, flares, barricades, markers, cones, flagmen, and other protective facilities and shall take all necessary precautions for the protection and for the convenience and safety of Park employees, public traffic, and Yosemite Concession Service operations. All such protective facilities and precautions to be taken shall conform to the U. S. Department of Transportation, Federal Highway Administration Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI-Traffic Control for Highway Construction and Maintenance Operations, latest edition, and as amended.</p> <p>Provide for the protection of pedestrians, bicyclists, and equestrians at all times.</p>	Contractor

Topic	Mitigation Measure	Responsibility
<b>TRANSPORTATION (cont.)</b>		
<b>MM-TRA-5</b> Traffic Control and Maintenance (cont.)	<p>Provide adequate, safe, non-skid bridging material over trenches, including shoring when trenching in pavement areas to handle all types of vehicular traffic.</p> <p>Whenever the Contractor's operations create a hazardous condition, the Contractor shall furnish flagpersons and guards as necessary to give adequate warning of any dangerous conditions to be encountered, and shall furnish, erect, and maintain such fences, barricades, lights, signs, and other devices as necessary to prevent accidents and avoid damage or injury to persons. Employ flagpersons to direct traffic as required to ensure safe vehicular travel. While on duty, flagpersons and guards shall be equipped with orange safety wearing apparel and a paddle-type signal, which shall be clean and in good repair.</p> <p>Provide two-way programmable radios to flagpersons if they are not in sight of each other at all times, or if necessary to ensure safe passage of vehicles.</p> <p>Provide, install, and maintain all signs, barricades, posts, guards and notices whenever a road or trail must be completely closed. Note that if posts are installed in ground, Contractor must contact USA-Dig and Archaeological Monitor for clearance to avoid culturally-sensitive areas. Remove or cover signs in conflict with traffic control requirements.</p> <p>Provide for passage and access of emergency vehicles, police, rangers, fire and disaster units at all times. Contractor assumes any and all liability for any damages resulting from failure to provide said access.</p> <p>Replace permanent pavement markings and traffic signs upon completion of each phase of work.</p> <p>At the end of each day's work or as soon as the work is completed remove all traffic control devices no longer needed to permit free and safe passage of traffic. Removal shall be in reverse order of installation. The traveled way shall not be obstructed with material, bedding, trench soil, nor with barricades or excavations. Excavations shall be backfilled, covered with steel traffic plate covers, or otherwise suitably protected so that traffic can pass unobstructed, as required, at night or over weekends and holidays. Temporary road repairs shall include road base and cold mix as specified to maintain a smooth, hard surface. The Contractor shall provide weekend and holiday road maintenance and repairs as necessary.</p> <p>All roads shall be kept open for public travel at all times unless specific written permission to close or restrict the use of a particular road is given by the COR. The Contractor is responsible for snow and ice control within the project limits utilizing NPS approved methods. Permission shall be granted upon approval of the specific Street Closure Traffic Control and Detour Plan for the intended closure. In the event that closing of a particular road is approved, it shall be the responsibility of the Contractor to notify the COR to reconfirm the hours and dates of the street closure and routes of detours at least 7 calendar days in advance of their occurrence, and again to notify the COR when the travel restriction is discontinued.</p> <p>No materials or equipment shall be stored where it will interfere with the free and safe passage of public traffic, and at the end of each day's work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the roadway to be opened for use by public traffic. No material or other obstructions shall be placed within 20 feet of fire hydrants, which shall at all times be readily accessible to the fire department, nor within 10 feet of United States mailboxes. Off-loading of materials at staging area shall be coordinated with the Contracting Officer as necessary.</p>	

Topic	Mitigation Measure	Responsibility
<b>TRANSPORTATION (cont.)</b>		
<b>MM-TRA-5</b> Traffic Control and Maintenance (cont.)	<p>Traffic delays due to Contractor's activities and associated traffic control shall not exceed 20 minutes, unless prior written approval has been received from the Contracting Officer.</p> <p>Alternative access for Park visitors to all major features and facilities in the Park shall be maintained using the existing road system.</p> <p>Full access shall be provided year-round to the public for all operating Park facilities (hotels, campgrounds, bike paths, trails, stores, restaurants, museums, restrooms, etc.), unless the project includes closing, rehabilitating or reconstructing those facilities, except trail closures for equipment and material transfer or transport described in Section 01110, Summary of Work.</p>	
<b>HISTORIC STRUCTURES</b>		
<b>MM-HIST-1</b> Historic Road Character	To minimize the effect of new culvert construction on historic road character within the valley, the new walls should be stone (not veneer), constructed using compatible stone in a form and masonry pattern that is compatible with the nearby historic period masonry.	Yosemite National Park; Contractor
<b>MM-HIST-2</b> Evaluation of The Ahwahnee Tennis Court	Prior to meadow restoration, the park shall, as per Section 106 of the NHPA, reevaluate the Ahwahnee tennis court for its continued integrity and eligibility as a contributor to the Ahwahnee Hotel Complex, and the extent to which the removal of the now defunct tennis court would impact the remaining contributors to the hotel complex. In the event that this resource is determined the maintain sufficient integrity to reflect its historic significance as a contributor, and that its loss would result in an adverse effect to the National Register hotel, in the event that avoidance is infeasible, the Park shall attempt resolution of adverse effects as per CFR § 800.6 establish appropriate mitigation of adverse effects through a Memorandum of Agreement between the Park and SHPO. Potential mitigation of impacts may include such actions as completing recordation through photographic and archival documentation, or providing for photographic interpretation of the site within the Ahwahnee Hotel.	Yosemite National Park; Contractor
<b>MM-HIST-3</b> Evaluation of Revetment Removal Sites	Prior to any ground disturbing activities associated with revetment, further analysis and possible documentation at each site would be required in order to assess potential adverse effects to historic resources.	Yosemite National Park; Contractor
<b>MM-HIST-4</b> Evaluation of Revetment Removal Sites	As per Section 106 of the NHPA, prior to construction or demolition activities, the Park shall survey the project area for potential impacts to historic buildings, structures, and districts within the project area of potential effect (APE). This will include a review of existing known historic resources for their continued integrity and eligibility for listing in the National Register, identification of currently unknown historic properties within the APE, determination of potential adverse effects and resolution of those effects in compliance with 36 CFR Part 800 – Protection of Historic Properties. Every effort shall be made to avoid adverse impacts. These efforts may include screening and/or sensitive design that would be compatible with cultural landscape resources.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>HISTORIC STRUCTURES (cont.)</b>		
<b>MM-HIST-5</b> Submittals	<p>Historic Preservation Treatment Program: The contractor shall submit a written plan for each phase or process including protection of surrounding materials during operations. Contractor shall describe in detail materials, methods, and equipment to be used for each phase of work.</p> <p>If alternative methods and materials to those indicated are proposed for any phase of work, contractor shall provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project.</p> <p>The contractor shall document, through videotape or photograph and submit to the Contracting Officer prior to commencement of work, existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by historic treatment operations.</p>	Yosemite National Park; Contractor
<b>MM-HIST-6</b> Removed and Salvaged Historic Materials:	<p>Contractor shall handle removed and salvaged historic materials in accordance with the following:</p> <ul style="list-style-type: none"> <li>• Clean salvaged historic items.</li> <li>• Pack or crate items after cleaning. Identify contents of containers.</li> <li>• Store items in a secure area until delivery to the NPS.</li> <li>• Transport items to storage area approved by Contracting Officer.</li> <li>• Protect items from damage during transport and storage.</li> <li>• Do not dispose of items removed from existing construction without prior written consent of Contracting Officer.</li> </ul>	Yosemite National Park; Contractor
<b>MM-HIST-7</b> Removed and Reinstalled Historic Materials	<p>Contractor shall handle removed and reinstalled historic materials in accordance with the following:</p> <ul style="list-style-type: none"> <li>• Clean and repair historic items to functional condition adequate for intended reuse.</li> <li>• Pack or crate items after cleaning and repairing. Identify contents of containers.</li> <li>• Protect items from damage during transport and storage.</li> <li>• Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.</li> </ul>	Yosemite National Park; Contractor
<b>MM-HIST-8</b> Existing Historic Materials to Remain	The contractor shall protect construction indicated to remain against damage and soiling during historic treatment. When permitted by Contracting Officer, items may be removed to a suitable, protected storage location during historic treatment, and cleaned and reinstalled, as appropriate, to their original locations after historic treatment operations are complete.	Yosemite National Park; Contractor
<b>MM-HIST-9</b> Storage and Protection	When removed from their existing location, contractor shall store historic materials within a weather-tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Contractor shall secure stored materials to ensure protection from theft.	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>HISTORIC STRUCTURES (cont.)</b>		
<b>MM-HIST-9</b> Storage and Protection (cont.)	<ul style="list-style-type: none"> <li>Identify removed items with an inconspicuous mark indicating their original location.</li> <li>Develop a key plan when many similar items are scheduled for removal and reinstallation.</li> </ul>	
<b>MM-HIST-10</b> Exterior Cleaning and Repairing	<p>Contractor shall conduct exterior cleaning and repair of historic structures in accordance with the following:</p> <ul style="list-style-type: none"> <li>Proceed with the work only when forecasted weather conditions are favorable.</li> <li>Not attempt repairs during rainy or foggy weather. Not apply primer, paint, putty, or epoxy when the relative humidity is above 80 percent. Not remove exterior elements of structures when rain is forecast or in progress.</li> <li>Not perform exterior wet work when the air temperature is below 40 deg F (5 deg C).</li> <li>Not begin cleaning, patching, or repairing when there is any likelihood of frost or freezing.</li> <li>Not begin cleaning when either the air or the surface temperature is below 45 deg F (7 deg C) unless approved means are provided for maintaining a 45 deg F (7 deg C) temperature of the air and materials during, and for 48 hours subsequent to, cleaning.</li> </ul>	Yosemite National Park; Contractor
<b>MM-HIST-11</b> General Historic Resource Protection	<p>Contractor shall undertake the following historic resource protection measures:</p> <ul style="list-style-type: none"> <li>Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.</li> <li>Ensure that supervisory personnel are present when work begins and during its progress.</li> <li>Protect existing materials during installation of temporary protections and construction. Not deface or remove existing materials.</li> <li>Obtain Contracting Officer approval prior to Attaching temporary protection to existing construction.</li> <li>Protect landscape work adjacent to or within work areas as follows: <ul style="list-style-type: none"> <li>Provide barriers to protect tree trunks.</li> <li>Bind spreading shrubs.</li> <li>Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time.</li> <li>Set scaffolding and ladder legs away from plants.</li> </ul> </li> <li>Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly.</li> <li>Notify Contracting Officer immediately of drains or systems that are stopped or blocked. Not begin Work of this Section until the drains are in working order.</li> </ul>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>HISTORIC STRUCTURES (cont.)</b>		
<b>MM-HIST-11</b> General Historic Resource Protection (cont.)	<ul style="list-style-type: none"> <li>• Provide a method to prevent solids including stone or mortar residue from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of work performed on corresponding project.</li> <li>• Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.</li> </ul>	
<b>MM-HIST-12</b> Protection During Application of Chemicals	<p>Contractor shall undertake the following during the application of chemicals:</p> <ul style="list-style-type: none"> <li>• Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners and paint removers.</li> <li>• Comply with requirements in Division 01 Section "Temporary Facilities and Controls."</li> <li>• Cover adjacent surfaces with materials that are proven to resist chemical cleaners selected for Project unless chemicals being used will not damage adjacent surfaces. Use covering materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.</li> <li>• Do not clean surfaces during winds of sufficient force to spread cleaning solutions to unprotected surfaces.</li> <li>• Neutralize and collect alkaline and acid wastes and dispose of outside park boundaries.</li> <li>• Dispose of runoff from chemical operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.</li> </ul>	Yosemite National Park; Contractor
<b>MM-HIST-13</b> Protection During Use of Heat-Generating Equipment	<p>Contractor shall comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:</p> <ul style="list-style-type: none"> <li>• Obtain Contracting Officer's approval for operations involving use of open-flame or welding equipment. <ul style="list-style-type: none"> <li>- Notification shall be given for each occurrence and location of work with heat-generating equipment.</li> <li>- Obtain the appropriate permit from the park as required.</li> </ul> </li> <li>• As far as practical, use heat-generating equipment in shop areas or outside the building.</li> <li>• Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.</li> <li>• Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.</li> <li>• Remove and keep the area free of combustibles, including, rubbish, paper, waste, etc., within area of operations. <ul style="list-style-type: none"> <li>- If combustible material cannot be removed, provide fireproof blankets to cover such materials.</li> </ul> </li> </ul>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>HISTORIC STRUCTURES (cont.)</b>		
<b>MM-HIST-13</b> Protection During Use of Heat-Generating Equipment (cont.)	<ul style="list-style-type: none"> <li>Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.</li> <li>Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.</li> <li>Inspect each location of the day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.</li> <li>Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.</li> </ul>	
<b>MM-HIST-14</b> Historic Preservation Treatment Procedures	<p>Contractor shall undertake the following historic preservation treatment procedures:</p> <ul style="list-style-type: none"> <li>Retain as much existing material as possible; repair and consolidate rather than replace.</li> <li>Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.</li> <li>Use reversible processes wherever possible.</li> <li>Use traditional replacement materials and techniques if possible. New work shall be distinguishable from old work and original materials and techniques.</li> <li>Record the existing condition before commencing with repair work; document with preconstruction photos, sketches and field notes. Record repair work during construction with periodic construction photos and daily inspection reporting. Photo documentation is specified in Division 01 Section "Photo Documentation For Historic Preservation Projects".</li> <li>Prohibit smoking by personnel performing work on or near historic structures.</li> <li>Notify Contracting Officer of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.               <ul style="list-style-type: none"> <li>Do not proceed with the work in question until directed by Contracting Officer.</li> </ul> </li> <li>Where Work requires existing features to be removed, cleaned, and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.</li> <li>Identify new or replacement materials and features with inconspicuous, permanent marks to distinguish them from original materials. Record the legend of identification marks and the locations of these marks on Record Drawings.</li> <li>When cleaning, match samples of existing materials that have been cleaned and identified for acceptable cleaning levels. Avoid over-cleaning to prevent damage to existing materials during cleaning. Only the gentlest methods available should be attempted. Initiate cleaning using hand cleaning methods before introducing power cleaning methods and equipment.</li> </ul>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>ARCHEOLOGICAL RESOURCES</b>		
<b>MM-AR-1</b> Archeological Resources	<p>Train all members of the restoration/construction teams in proper handling of inadvertent discovery of archaeological resources. Training would involve information regarding the types of archeological materials that are likely present in the specific project area, how to identify archeological materials, and the procedures for contacting the appropriate parties in the event that archeological materials are encountered during restoration/construction activities.</p> <p>All restoration/construction personnel would be required to participate in the training, and written guidelines would be prepared and distributed to aid in identification of archeological materials and to inform workers of the procedures to follow in case of a discovery or potential discovery. If buried archeological resources such as flaked stone or groundstone, historic debris, building foundations, midden soils or human bone are inadvertently discovered during ground-disturbing activities, work shall stop in that area and within a 100-foot radius of the find until a qualified archeologist can assess the significance of the find.</p> <p>Inadvertent discoveries would be treated in accordance with 36 CFR 800.13 (Protection of Historic Properties: Post-review discoveries). The archeological resource would be assessed for its eligibility for listing on the National Register in consultation with the SHPO and representatives of traditionally associated American Indian tribes and groups (if it is an American Indian archeological site), and a determination of the project effects on the site would be made. If the site would be adversely affected, a treatment plan would also be prepared as needed during the assessment of the site's significance. Assessment of inadvertent discoveries may require archeological excavations and/or archival research to determine resource significance. Treatment plans would fully evaluate avoidance, project redesign, and data recovery alternatives before outlining actions proposed to resolve adverse effects.</p> <p>If human skeletal remains are encountered, protocols under federal and state law would apply. All work shall stop in the vicinity of the discovery, and the find would be secured and protected in place. The appropriate county coroner (Mariposa or Merced) and Park Archeologist would both be immediately notified. If analyses determine that the remains are American Indian, and that no further coroner investigation of the cause of death is required, the coroner would then be required to contact the NAHC (pursuant to Section 7050.5[c] of the California Health and Safety Code) and the County Coordinator of Indian Affairs. The remains would also be treated in accordance with the Native American Graves Protection and Repatriation Regulations at 43 CFR 10.4 (Inadvertent discoveries).</p>	Yosemite National Park; Contractor
<b>MM-AR-2</b> Ground Disturbance and Testing	<p>Management actions involving moderate to severe ground disturbance (trail reroutes; formalization of social trails; excavations for subsurface utilities; development of campgrounds; removal of abandoned infrastructure and/or facilities, construction of buildings, structures, parking lots, and roads; topographic recontouring; decompaction and plant salvage; and actions that may focus visitor use at areas with sensitive surface resources) within or adjacent to the boundaries of known archeological sites shall be preceded by intensive surface survey and/or controlled subsurface testing, as determined appropriate given past studies and findings.</p> <p>Initial limited testing shall be conducted in the area(s) proposed for ground disturbance, to first determine if the presence of site components can be verified. If so, the methods of achieving the proposed action may be modified and/or relocated, if possible. If effects could not be avoided, archeological treatment measures would be site-specific and contingent on previous studies' results and the level of work proposed.</p>	Yosemite National Park; Contractor



Topic	Mitigation Measure	Responsibility
<b>ARCHEOLOGICAL RESOURCES (cont.)</b>		
<b>MM-AR-3</b> Ground Disturbance and Monitoring	<p>A Government provided Archeological Monitor, and as necessary, Native American Monitor, will observe all ground-disturbing site work, including construction of temporary facilities at all culturally sensitive areas, from a safe location mutually agreed on by Contractor, Contracting Officer and Monitors. As new ground is broken, Monitors will examine excavated materials, using construction layout centerline and perimeter staking as a reference point to record locations of findings.</p> <p>Monitoring may also be included as part of a treatment plan for individual resources following initial testing as per MM-AR-2</p> <p>Prior to construction, mark with flagging all sensitive cultural resources to be protected within the project area identified per the requirements of the plans and specifications. Proper placement of flagging shall be verified by the Contracting Officer. Upon verification, erect necessary fencing to identify and protect cultural resources from disturbance.</p> <p>Do not begin ground-penetrating work such as excavation, trenching, drilling, or stump and root removal in culturally sensitive areas without the presence of Archeological Monitor, and if required, Native American Monitor.</p> <p>The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis. If the monitor determines that any portion of the proposed action could have an adverse effect on the site, alternative methods of accomplishing the action shall be discussed with the restoration personnel. Restoration activities within site boundaries shall be conducted using manual tools rather than mechanized equipment whenever possible, and no stock animals or wheeled vehicles used for transport of workers and tools shall be allowed within 10 meters of the known site boundary.</p> <p>If Archeological Monitor or Native American Monitor discovers resources, immediate relocation of the work to a non-sensitive area may be required to allow Monitors to take soil samples and record resources. While Monitors are documenting resources in sensitive areas, Contractor shall relocate work to non-sensitive areas.</p> <p>If an Archeological Monitor requires access to a construction area the contractor shall furnish safe access, free from recognized hazards, to enable the monitor to complete his/her duties. This will commonly involve trench access when soil sampling is deemed necessary by the Archeologist.</p> <p>If resources are discovered while Monitors are absent, stop work immediately and report the discovery to the Contracting Officer.</p> <p>Stop Work: Cease all activities in the area of discovery and protect the resources discovered. In the event the discovery represents human remains or any objects subject to the Native American Graves Protection and Repatriation Act (NAGPRA), the NPS will follow procedures outlined in NAGPRA regulations. This will require a stoppage of work in the area of work for a minimum of 30 calendar days. In the event of an inadvertent discovery of Cultural Resources, be prepared to stop work and continue in other areas.</p> <p>The Contractor shall plan, schedule, and execute the work to prevent stoppages at one area from stopping all work at the construction site.</p>	Yosemite National Park; Contractor

Topic	Mitigation Measure	Responsibility
<b>ARCHEOLOGICAL RESOURCES (cont.)</b>		
<b>MM-AR-4</b> Daily work schedule	<p>A Daily Work Schedule is required for all work occurring within archeologically sensitive areas. Include all work that is to occur within the area and key the schedule to the drawings to include the following:</p> <ol style="list-style-type: none"> <li>1. Starting and ending dates of ground-disturbing construction.</li> <li>2. Locations of temporary facilities, such as barriers, field offices, staging areas, sanitary facilities, borrow pits, and haul and access roads.</li> <li>3. Types of construction, such as clearing, topsoil stripping, structure or trench excavation, landscaping, and post construction clean-up.</li> <li>4. Methods and equipment used for each type of construction.</li> <li>5. Plan for relocating work in the event of temporary work stoppages at each archeologically sensitive area</li> <li>6. A permit is required for any archeological investigations (e.g. excavation, shovel testing, coring, pedestrian survey, underwater archeology, rock art documentation, or other types of reconnaissance including the archaeological monitoring of construction) carried out on parklands by non-NPS personnel, unless carried out under a contract or a cooperative agreement specifically written for archeological investigations. Permits are issued under the Archaeological Resources Protection Act of 1979 (ARPA). The NPS does not issue a permit for archeological investigations carried out by NPS archeologists, or to archeologists working on NPS archeological projects under a contract or cooperative agreement.</li> <li>7. Applicants should submit a Permit Application (DI Form 1926 (Rev Sept 2004) OMB No. 1024-0037, approved through 1/31/2008 – the Permit Application form is available in pdf format) to the manager of the park in which they propose to work; or to the regional director, with a copy to the park manager.</li> </ol>	Yosemite National Park; Contractor

## **APPENDIX D**

### **DRAFT FLOODPLAIN STATEMENT OF FINDINGS**

## APPENDIX D

### FLOODPLAIN STATEMENT OF FINDINGS FOR THE MERCED WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN/DEIS

This Floodplain Statement of Findings is included in this document for public review to meet the obligations of Executive Order 11988 (*Floodplain Management*), Director's Order #77-2: Floodplain Management (2003), and the NPS Procedural Manual 77-2: Floodplain Management (update 2004).

#### INTRODUCTION

The National Park Service (NPS) has prepared the *Merced Wild and Scenic River Comprehensive Management Plan Draft Environmental Impact Statement (Merced River Plan /DEIS)* to provide direction and propose specific actions to protect and enhance ecological and natural resource values of the Merced Wild and Scenic River, support opportunities for visitors to experience and develop direct connections to the Merced River, institute a visitor-use management program, and provide clear direction on land uses and associated developments in the river corridor. It is based on the broad goals of the 1980 *General Management Plan* for Yosemite National Park.

The purpose of this Floodplain Statement of Findings is to review the *Merced River Plan/DEIS* in sufficient detail to:

- Provide an accurate and complete description of the flood hazard assumed by implementation of the proposed action (without mitigation)
- Provide an analysis of the comparative flood risk among alternatives
- Describe the effects on floodplain values associated with the proposed action
- Provide a thorough description and evaluation of mitigation measures developed to achieve compliance with Executive Order 11988 (*Floodplain Management*), Director's Order 77-2, and Procedural Manual 77-2: Floodplain Management

#### Floodplains and Floodplain Extent

Flood hazard areas regulated by the NPS include the 100-year floodplain (1% annual chance of inundation), the 500-year floodplain (0.2% chance of annual inundation), and the Extreme Floodplain (largest magnitude flood possible at a site). According to the NPS Director's Order 77-2 ("Floodplain Management"), for any proposed action that is found to be in the applicable regulatory floodplain, the NPS must prepare a floodplain assessment, known as a Statement of Findings, in accordance with NPS Procedural Manual 77-2: Floodplain Management.

The best available data were used to determine the extent of existing floodplain boundaries and water surface characteristics of the Merced River, as documented in the DEIS. Floodplains have not been defined within the Merced River above Nevada Fall (including Little Yosemite Valley), nor within the Merced Gorge.

## GENERAL CHARACTERISTICS OF FLOODING IN THE AREA

Flooding along the Merced River can be generally categorized as one of two general types: (1) *spring floods* include flooding that occurs as a result of spring and summer snowmelt and associated runoff; (2) *Winter floods* or *rain on snow events* include those that occur during the late fall and winter (September through April), primarily as a result of intense rainfall or rainfall on snow. From 1916 through 1989, 124 of 140 recorded high flows on the Merced River in Yosemite Valley were spring floods that occurred in response to spring or early summer snowmelt conditions (NPS 1991). Only about 10% of total floods in the park are winter floods or rain on snow events. However, these events are responsible for the highest floods recorded, especially where warm heavy rains fall on snow in higher elevations. Frazil ice, while less common, is another cause of flooding within the park. Frazil ice occurs within waterfalls, and is generated by ice crystals at the base of a waterfall when air temperature drops to below freezing. Frazil ice can be many feet thick, which can cause localized impoundments and other flooding.

At the beginning of the wet season, the ground is extremely dry, and about 3 to 5 inches of precipitation is required to satisfy the retention storage capacity of the soil before any significant runoff occurs. Later in the season, when the ground may be very wet and there may be a moderate snow cover at the higher elevations, heavy rainfall over the basin can cause large flood runoff. An intense storm with a high freezing level may also result in flood runoff from almost the entire basin, with as much as 2 inches of snowmelt augmenting the rainfall, based on historic measurements. Most of the runoff from the Merced River basin occurs from November through July (Madej et al. 1994).

Well-functioning floodplains can potentially provide an array of natural resource values within the Park, including habitat for vegetation and wildlife, periodic disturbance to habitats within floodplains (which can support ecological value and spatial diversity in habitat), dissipation of flood energy by allowing flood waters to spread across a floodplain area, benefits to waterway hydrologic processes including fluvial transport mechanisms and river geomorphic processes, and groundwater recharge in areas where soils are sufficiently pervious. Key floodplains in the study area include the broad floodplains of Yosemite Valley, Little Yosemite Valley, El Portal, and Wawona.

The discussion of flooding along the Merced River is divided among the following segments:

### Merced River above Nevada Fall

The Merced River's floodplains in remote areas above Nevada Fall have not been defined. Steep topography limits the floodplain in the upper canyon areas. High-elevation tributaries (e.g., Merced Peak Fork and Triple Peak Fork) are sparsely vegetated with scattered patches of alpine riparian scrub and alpine willow thickets. Within Little Yosemite Valley, the floodplain likely encompasses most of

the valley floor; however, the 100-year floodplain has not been mapped. Here, the river meanders across its floodplain, creating oxbow lakes and meander cutoffs. As the river descends and the gradient becomes gentler, lodgepole pines, aspens (*Populus tremuloides*), willows (*Salix* spp.), and alders (*Alnus* spp.) become more prevalent. Willows often colonize where point bars form (at the margins of, or within, the river channel). Riparian species often intergrade with coniferous forest at or near the river's upper banks (NPS 1997a; Sawyer et al. 2009).

Although 100-year floodplains have not been mapped in this area, it is assumed that the Merced Lake High Sierra Camp is located within the existing floodplain.

## **Yosemite Valley**

Yosemite Valley has a well-developed, relatively wide floodplain that is confined by steep valley walls. The Merced River in Yosemite Valley has a relatively mild slope, with an average of 0.1%. In the middle reach of the river in Yosemite Valley, downstream of Clark's Bridge to the El Capitan moraine, the river flows through a shallow channel approximately 100 to 300 feet wide.

Riparian zones in Yosemite Valley are characterized by broadleaf deciduous trees, such as white alder (*Alnus rhombifolia*), black cottonwood (*Populus trichocarpa*), big-leaf maple (*Acer macrophyllum*), white fir, and willow species. Riparian areas within the valley are rich in species diversity and structure. Riparian vegetation is regularly disturbed by the deposition and removal of soil and the force of floodwaters. Plants in this zone colonize newly formed river-edge deposits readily. The distribution of riparian communities varies with soil saturation and frequency of disturbance. For example, big-leaf maple riparian forests grow on moist gravelly soils in protected spots on alluvial soils bordering streams, whereas sandbar willow woodlands occur on point and mid-channel bars that are washed over annually by spring floods (NPS 1994). In Yosemite Valley, the character of the floodplain varies in different locations due to local hydraulic controls. From Clark's Bridge to Housekeeping Camp in the east Valley, the river floods areas outside the main channel with shallow swift flows that cut across meander bends. Near Yosemite Lodge and downstream to the El Capitan moraine, flood waters back up against the dense vegetation and tend to be deep, low velocity, and low energy. From the El Capitan moraine downstream, the river channel is steeper and confined in the narrow river canyon, the floodplain is narrow, and flow velocities are high.

In 1879, large boulders were blasted to deepen and widen the river gap through the El Capitan moraine, which lowered the base level of the Merced River by 4 to 5 feet (Milestone 1978). As a result, the extent and frequency of flooding in the upstream meadows was reduced, possibly leading to drier conditions and the loss of historic wetlands.

Regular flooding and subsequent deposition of alluvial sediments have been instrumental in the formation of Yosemite Valley. Flooding continues to support a variety of natural processes in the valley, such as deposition of flood-borne sediment; channel avulsion (i.e., abandonment of an old river channel and the creation of a new one); and the development of complex channel patterns and valuable riparian and wetland habitat. The largest document events occurred in 1937, 1950, 1955, and 1997, with peak discharges measured in the range of 22,000 to 25,000 cubic feet per second at Pohono

Bridge. These floods were the result of rain-on-snow events. Several large undocumented events also occurred during the 1860s and 1870s.

The January 1997 flood was the largest recorded flood within the park with a peak discharge of 10,000 cubic feet per second at Happy Isles and 25,000 cubic feet per second at Pohono Bridge (Eagan 1998). The flood inundated roads, picnic areas, park offices, and lodging units. It caused extensive damage to NPS facilities, including roads, bridges, buildings, and Yosemite Valley's electric, water, and sewer systems. The flood also altered natural features and caused downed trees, movement of landslide talus into streams, channel erosion, and substantial changes in channel morphology (NPS 1997b). This flood was estimated to have a recurrence interval of 90 years (NPS 1997b), or about a 1.1% chance of occurring in any given year.

The deposition and removal of soil and the force of flood waters in Segment 2 regularly disturb riparian vegetation. The park has historically cleared large wood from the Merced River to improve flow (to reduce flooding hazard), prevent bank erosion that might compromise park infrastructure, for visitor safety, to remove hazards to commercial rafting, and for aesthetic reasons. Since 1993, it has been park policy to allow large wood in the Merced River to remain, sometimes with some manipulation in its placement, unless it causes a serious safety concern or threatens infrastructure.

Facilities located within the 100-year floodplain within this segment include (generally moving from east to west) portions of the Upper Pines Campground area including a recreational vehicle dump station, a portion of Lower Pines Campground including four restrooms, most of North Pines campground including four restrooms and a lift station, a portion of Backpackers Campground, and most of the Concessioner Stable and the 18 associated housing units and community kitchen. Additionally, most of the Housekeeping Camp area including lodging units, showerhouses and restrooms, and other structures, the Lower River Amphitheatre, and the Yosemite Village Day-use Parking Area are located in the 100-year floodplain. The Lower Tecoya Dormitories A, B, C, D, E, F and the Laundry Building, in addition to two Concessioner apartment buildings and associated garages and sheds, eight single-family residences, the Concessioner General Office, the Concessioner Garage, the Concessioner Valley Fire House, Lost and Found, security buildings are all in the 100-year floodplain. In the vicinity of the Yosemite Lodge area, structures within the 100-year floodplain include Superintendent's House (Residence 1) and garage, the Yosemite Creek sewage lift station, groundwater wells near Yosemite Creek, and four lodging buildings at the Yosemite Lodge in addition to three housing buildings near Yosemite Lodge (Thousands Cabins). In the West Valley, the Swinging Bridge Picnic Area, the Sentinel Beach Picnic Area, the Yellow Pine Administrative Campground, the Cathedral Beach Picnic Area, and the gauging station near Pohono Bridge are in the 100-year floodplain.

Over the past two decades, the National Park Service has implemented numerous efforts to restore the underlying natural processes that sustain Yosemite Valley riparian habitats. These efforts include, invasive plant eradication, fencing off sensitive areas, and increasing inundation levels through restoration of natural drainage patterns. A more detailed description of past and present restoration projects is included in the *Merced River and Riparian Vegetation Assessment* (Cardno ENTRIX 2011) and the *Assessment of Meadows in the Merced River Corridor* (Ballenger et al. 2011). These efforts have been successful in improving the overall condition of riparian areas throughout Yosemite Valley.

However, these reports also identify a number of persisting stressors on the Valley's riparian ecosystems, such as roads, parking areas, structures, campgrounds, and informal trails.

## **Merced River Gorge and El Portal Watershed**

From the location of the former Cascades Diversion Dam downstream to the El Portal Administrative Site, the river channel is steep and confined to a narrow river gorge. In this area, the floodplain is narrow and flow velocities are very high. The Merced River Gorge is a unique display of lower elevation habitat. It is lined with a narrow band of riparian vegetation along the river, bordered by a dense mosaic of chaparral and foothill woodland communities (chaparral/oak woodland zone) on the steep canyon walls.

The Merced River channel in El Portal can shift during large floods, including movement of large boulders that define the channel. One hundred-year discharge of the Merced River in El Portal is estimated to be 32,800 cubic feet per second (PBS&J 2011). Flooding has been an important aspect of the development of riparian communities along the Merced River and its tributaries that intersect drier adjacent vegetation types of El Portal. Within this area, El Portal Road and small levees alter the floodplain by restricting flow during flood events and forming a barrier to channel migration. Facilities located within the 100-year floodplain within this segment include temporary El Portal Special Park Uses Trailers, the embankment/levee between El Portal Market and gas station and the river, Odger's Fuel Storage Facility, the AT&T building, a water valve station, NatureBridge office and employee housing building, the old Wastewater Treatment Plant, portions of Abbieville/Trailer Village employee housing area, and the administrative parking area between Foresta Road and the Merced River at the National Park Service's Warehouse and Administrative Complex. As with certain points within Yosemite Valley, this infrastructure has impacted floodplain habitats.

In the El Portal area, riparian communities occur along tributaries of the Merced River, on flat topographical shaded terraces above the river, in backwater channels, and in areas where runoff from upland sites collects in natural depressions. Native Oregon ash (*Fraximus latifolia*) trees occur in the wetter areas, as well as orchard components in some locations. Foothill pines and valley oaks tend to dominate the drier terraces adjacent to riparian sites.

## **South Fork Merced River**

The floodplain in Wawona along the South Fork is an elongated alluvial valley. In this area, the river meanders through a large floodplain meadow, and the channel can shift laterally during large floods. Upstream of the Big Creek confluence, the average annual flow was 174 cubic feet per second between 1958 and 1968, as measured at the Wawona gauging station, with an estimated maximum flow of 15,000 cubic feet per second in December 1955. The 100-year discharge of the South Fork Merced River is estimated to be 19,700 cubic feet per second (PBS&J 2011).

In the portions where the gradient is gentlest, riparian vegetation (willows and alders) becomes more prevalent. Willows often colonize sandbars that are deposited at the margins of or within the river channel. In this area, the riparian corridor resembles the riparian corridor seen along the Merced



River as it flows through Yosemite Valley. Also found in this area is Sierra sweet bay (*Myrica hartwegii*), a shrub endemic to the Sierra Nevada. In Yosemite National Park, Sierra sweet bay is found at the average high water line of the South Fork Merced River downstream from Wawona and along Big Creek (NPS 2012). The NPS (2002) considers Sierra sweet bay a sensitive species, and the California Native Plant Society (CNPS Rank 4.3) identifies the plant as being of limited distribution.

Facilities located within the 100-year floodplain within this segment include portions of the Pioneer Yosemite History Center, the Wawona Covered Bridge, South Fork Wawona Picnic Area, a portion of the Wawona Campground, the Yosemite Transportation Company office, utility buildings, the Ranger Station, and a bakery building. As with certain points within Yosemite Valley, this infrastructure has impacted floodplain habitats. In addition, trampling of riparian vegetation and associated erosion also occurs in this area, resulting from use in the vicinity of the Wawona Store and Gas Station area and the Wawona Campground.

## PREFERRED ALTERNATIVE

The *Merced River Plan/DEIS* includes an evaluation of six alternatives including five action alternatives, each of which would implement a series of management actions within the Merced Wild and Scenic River corridor. Each action alternative addresses issues relevant to protection and enhancement of river values, user capacity management, and land use and facilities. Alternative 5: *Enhanced Visitor Experience and Essential Riverbank Restoration* has been identified as the Preferred Alternative. This alternative is characterized by restoring riparian areas within 100 feet of the ordinary high water mark. To address free-flowing conditions, Alternative 5 includes the removal of Sugar Pine Bridge and reestablishing channel complexity in East Yosemite Valley. Alternative 5 includes restoration of 203 acres within the river corridor, including removing existing campsites within 100-feet of the ordinary highwater mark, Housekeeping Camp lodging units within the ordinary high water mark, informal trails in meadows and wetland areas, and roadside parking adjacent to meadows. In terms of recreation, limited private boating would be allowed by permit on river stretches within all segments. Under Alternative 5, peak daily visitation within Yosemite Valley would be slightly reduced (19,900) as compared to peak visitation at present (20,900). Additional temporary and overflow parking areas would be located in West Yosemite Valley and at Abbieville/Trailer Village in El Portal to alleviate traffic congestion on busy peak summer days. The shuttle system would be expanded to serve these new locations.

## Existing Structures in the Floodplain

The NPS Director's Order 77-2 and Procedural Manual 77-2 consider the evaluation of actions that may be grouped into the following three categories:

- Class I Actions – include administrative, residential, warehouse and maintenance buildings, and nonexempted (overnight) parking lots
- Class II Actions – those that would create “an added disastrous dimension to the flood event.” Class II actions include schools, clinics, emergency services, fuel storage facilities, large sewage treatment plants, and structures such as museums that store irreplaceable records and artifacts.

- Class III Actions – Class I or Class II Actions that are located in high hazard areas such as those subject to flash flooding.

The regulatory floodplain for Class I actions is the 100-year floodplain. The following existing structures in the study area's regulatory floodplain constitute Class I Actions:

- Housekeeping Camp; Backpackers, Lower Pines, and North Pines campgrounds; portions of Ahwahnee Row and Tecoya housing area, the Concessioner General Office and Garage, select Yosemite Lodge buildings, and associated infrastructure.

The following existing structures located in the study area's regulatory floodplain constitute Class II Actions:

- Odger's Fuel Storage Facility (main tanks are outside of the 500-year floodplain, other facilities with less than 40,000 gallon per day capacity are located within the 500-year floodplain), El Portal Gas Station, and the El Portal Wastewater Treatment Plant (500-year floodplain).

There are no Class III actions in the study area.

## **Proposed Actions**

Under the Preferred Alternative, the following actions would be located within floodplains and would either have a net beneficial impact on floodplains, or would not affect floodplain function. Therefore, the following actions are not discussed further within this document:

- Removal of conifer seedlings and saplings from meadows
- Reinstitution of low intensity/high frequency fire as an ecological process
- Installation of logjams and large wood management
- Placement of large wood (including large trees with root wads) between Ahwahnee and Stoneman bridges which would increase roughness in the river as well as channel complexity
- Establishing a riparian buffer that includes a restriction on new development or redevelopment of existing facilities within 150 feet of the ordinary high water mark
- Meadow restoration at Ahwahnee, El Capitan, Leidig, Cooks, Slaughterhouse, Bridalveil, and Stoneman meadows

Under the Preferred Alternative, the following facilities would be removed from the floodplain. Removal of these existing structures from the floodplain represents a net beneficial impact. Therefore, removal of these facilities is not discussed further within this document:

- Concessioner General Office and Concessioner Garage
- 34 units from within the observed ordinary high water mark at Housekeeping Camp

- Abandoned infrastructure such as remnant pavement associated with the former Upper and Lower River Campgrounds
- Campsites within 100' of the ordinary high water mark at Backpacker's Camp, Lower Pines, and North Pines Campgrounds
- Sugar Pine Bridge and the associated road berm
- Imported rock/concrete/asphalt/soil at Greenemeyer sandpit
- Housing units at the Yosemite Lodge
- Odger's Fuel Storage Facility. This facility is presently in use and provides important storage and distribution capacity for fuel within the area. The existing tanks are located outside of the floodplain, while remaining facilities are located within the 500-year floodplain. The facility would be removed from the floodplain.
- Old Wastewater Treatment Plant in El Portal

Under the Preferred Alternative, the following facilities would remain or could be placed in the floodplain. Rational for leaving these facilities within the floodplain, associated risk, and proposed mitigation or management strategies for these facilities are discussed subsequently:

- Merced River above Nevada Fall:
  - Merced Lake High Sierra Camp
- Yosemite Valley:
  - Ahwahnee Row Houses
  - Tecoya Dorms and other Concessioner Housing in the vicinity of Indian Creek (apartments and single-family residences)
  - Yosemite Lodge area facilities including overnight units and associated parking, laundry building, lost and found, the security building, and the Concessioner Valley Fire House, the Superintendent's House, Yosemite Creek Sewage Lift Station, groundwater wells near Yosemite Creek, four lodging buildings at Yosemite Lodge, in addition to three housing buildings near Yosemite Lodge (Thousand Cabins)
  - Housekeeping Camp, with 232 units, shower houses, restrooms, and laundry facilities
  - Yosemite Valley Campgrounds including North Pines, Backpackers, portions of Lower Pines, Upper Pines, and Yellow Pines Administrative Campgrounds, plus new camping facilities (30 walk-in camp sites) at Upper River Campgrounds and near Upper Pines Campground
  - Concessioner Stable
  - Yosemite Village Day-Use Parking Area and Rerouting of Northside Drive to south of the Yosemite Village Day-Use Parking Area
  - Lower River Amphitheater
  - West Valley picnic areas

- Guaging Station near Pohono Bridge
- Merced River Gorge and El Portal:
  - Facilities near Old El Portal including the AT&T Building, NatureBridge office and employee housing, and a water valve station
  - El Portal Market building
  - El Portal gas station
  - Administrative parking area between Foresta Road and the Merced River at the National Park Service's Warehouse and Administrative Complex
  - Temporary El Portal Special Park Uses Trailers
  - Embankment/levee between El Portal Market and gas station and the river
  - Portions of Abbieville/Trailer Village employee housing area
- South Fork Merced River:
  - Yosemite transportation Company office
  - Historic facilities including the Wawona Covered Bridge and portions of the Pioneer Yosemite History Center
  - Utility buildings
  - Ranger Station
  - Bakery building
  - Portions of the Wawona Campground and the South Fork Wawona Picnic Area

## **RATIONALE FOR CONTINUED USE OF THE FLOODPLAIN**

To the extent practicable and appropriate, the Preferred Alternative includes the removal of existing facilities to outside of the 100-year floodplain, and does not propose to place new facilities in the floodplain that would interfere with floodplain function or that would cause or exacerbate flood related hazards. However, NPS was not able to develop a feasible alternative that involved removal of all existing facilities from the 100-year floodplain. Key constraints that prevent the removal of additional facilities from the 100-year floodplain center on a lack of available land area that is not located in a floodplain or rockfall hazard zone. The following provides additional information and details regarding existing development that would remain in the floodplain with implementation of the Preferred Alternative.

## Existing and Proposed Development that would Remain or be Located in the Floodplain in the Preferred Alternative

### *Merced River above Nevada Fall*

**High Sierra Camp Reduction to 11 Units.** Removal of existing facilities would result in a net benefit to floodplains, and beneficial effects are not discussed further. Remaining facilities (11 units) are presumed to be located within the 100-year floodplain based on their proximity to the river, although floodplains have not been delineated. The remaining facilities would not be removed because they provide a unique experience to visitors within the area.

### *Yosemite Valley*

**Ahwahnee Row Houses.** These houses would not be removed because they are important contributing elements to the Yosemite Valley cultural landscape, are contributors to the Yosemite Village Historic District, and their removal or demolition would result in an adverse effect on this historic resource. Therefore, these facilities would not be removed.

**Tecoya Dorms and Other Concessioner Housing in the Vicinity of Indian Creek (apartments and single-family residences).** The Tecoya dorms are a part of the National Register listed Yosemite Valley Historic District, and their removal or demolition, as well as that of concessioner housing, would result in an adverse effect to this historic resource. Therefore, these facilities would not be removed.

**Yosemite Lodge Area Facilities (overnight units, parking, laundry building, lost and found, security building, Concessioner Valley Fire House, Superintendent's House, Yosemite Creek Sewage Lift Station, groundwater wells near Yosemite Creek, four lodging buildings at Yosemite Lodge, three housing buildings near Yosemite Lodge (Thousand Cabins)).** These buildings facilities within the Yosemite Lodge complex and the day use parking lot are located within the 100-year floodplain. These would not be removed under the Preferred Alternative. Existing facilities that are located within the floodplain are adjacent to areas that are above or outside of the floodplain, including most of the Yosemite Lodge complex. These facilities are important contributing elements to the Yosemite Valley cultural landscape, provide unique experience and access for visitors, provide lodging and/or critical facilities services to the area, and therefore would not be removed.

**Housekeeping Camp (232 units, shower houses, restrooms, laundry facilities).** These units and facilities are available seasonally, and the area is closed for overnight use in the winter, when most high-flow winter flooding events have occurred. In the Preferred Alternative all but 34 units at Housekeeping Camp would remain in the floodplain along with other existing structures located on site, for a total of 232 units remaining. These facilities have a unique function within Yosemite Valley and provide a unique experience to visitors – opportunity for a rustic camping experience with “developed camping shelters” that eliminate the need to purchase a large amount of camping equipment. Also, these facilities would be closed during periods of high flood risk, and there would be sufficient time to evacuate visitors in the unlikely event that evacuation would be necessary. Therefore, these facilities would not be removed.

**Yosemite Valley Campgrounds (North Pines, Backpackers, portions of Lower Pines, Upper Pines, and Yellow Pines Administrative Campground, plus new camping facilities (30 walk-in camp sites) at Upper River Campgrounds and near Upper Pines Campground).** To preserve the floodplain values in areas close to the river while still preserving the unique visitor experiences afforded by these campgrounds, existing units within these campgrounds that are located within 100 feet of the high water mark would be removed. However, other existing campsites that are located within the larger floodplain area would not be removed, and new walk-in camping opportunities would be provided at Upper River Campground and near Upper Pines Campground. These campgrounds are/would be closed during the winter, when most high flow winter or rain-on-snow flooding events have historically occurred. There would be sufficient time to evacuate visitors in the unlikely event that evacuation would be necessary. These facilities provide or would provide unique visitor experiences and would be closed during periods of high risk. Therefore, they would not be removed.

**Concessioner Stable.** The concessioner stable supports commercial day rides along pack stock trails in the area, and also offer High Sierra Camp rides. Thus the Concessioner stable supports unique visitor experience including horseback access to the High Sierra Camp, as well as other portions of the park. During a potential flood event, the facility could be closed or readily evacuated in order to avoid potential hazards.

**Yosemite Village Day-use Parking Area and Rerouting of Northside Drive.** These facilities would continue to serve as the primary day-use parking area for Yosemite Valley and serves to access Yosemite Village, and Northside Drive would be rerouted to provide improved service to the area. Design measures for these facilities would be implemented to minimize potential effects on floodplains. Maintaining the parking lot and rerouting Northside Drive would preserve unique visitor experiences afforded by parking access and enhanced vehicle access to the area. Therefore, these facilities would not be removed.

**Lower River Amphitheater.** The Lower River Amphitheater supports unique visitor experience within the Yosemite Valley, ranging from children's theater opportunities to weekly religious services. The amphitheater includes bench seating and a limited stage area. Maintaining the facility would preserve these and other unique visitor experiences associated with the facility, and the facility could be evacuated quickly in the event of a potential flood event. Therefore, the amphitheater would not be removed.

**West Valley Picnic Areas.** Picnic areas in Yosemite Valley, including the western valley, including the Swinging Beach Picnic Area the Sentinel Beach Picnic Area, and the Cathedral Beach Picnic Area support visitor access to these areas, affording scenic views and encounter with these unique natural areas. These picnic areas present minimal obstruction to flood flows, and would either be closed during seasonal flooding periods, or could be easily evacuated in the event of a flood event. Therefore, these facilities would not be removed.

**Gauging Station near Pohono Bridge.** The existing gauging station supports measurement and monitoring of river levels in this area. Due to the nature of the facility, which collects data on river

stage, the facility must be located within the floodplain in order to collect the needed data. Therefore, this facility would not be removed.

### ***Merced River Gorge and El Portal Watershed***

**Facilities near Old El Portal (AT&T Building, NatureBridge office and employee housing, water valve station).** These facilities are presently in use. NatureBridge is an official park partner, and helps the NPS to achieve its mission, while AT&T provides communications support services. Additionally, the NatureBridge facility is on the list of classified structures and is an important cultural resource. The existing water valve station is critical to the function of existing infrastructure within the area. As an unmanned station, the facility does not represent a substantial risk to humans. The indicated buildings would continue to be utilized by employees, but could be easily and rapidly evacuated in the event of a potential flood. Therefore, these facilities would not be removed from the floodplain.

**El Portal Market Building.** This facility is presently in use and provide key services within the El Portal area. The facility would continue to be used by employees and visitors. However, because it is located in close proximity to the edge of the 100-year floodplain, it could be evacuated easily in the event of a potential flood. This facility would not be removed from the floodplain.

**El Portal Gas Station.** This facility is presently in use and provides important refueling capacity within the area, and support visitor use within the park and area. The facility would not be removed from the floodplain.

**Administrative Parking Area (between Foresta Road and the Merced River at the National Park Service's Warehouse and Administrative Complex).** This existing parking structure provides parking facilities in support of adjacent buildings and services, and is currently in use by the National Park Service. In the event of a potential flood, this area could be evacuated easily and rapidly. The facility would not be removed from the floodplain.

**Temporary El Portal Special Park Uses Trailers.** These facilities are considered temporary until uses can be redesignated to other areas or facilities. In the interim, the trailers remain in use and in support of Park services. In the event of a potential flood, the facilities could be easily evacuated. These facilities would not be removed from the floodplain.

**Embankment/Levee between El Portal Market and Gas Station and the Merced River.** This existing embankment provides partial control of high water flows in this area. While the facility does not effectively protect against 100-year flooding, it does provide some degree of protection during lesser potential flood events. The facility is unmanned. This facility provides critical support to adjacent infrastructure, and would not be removed.

**Portions of the Abbieville/Trailer Village Employee Housing Area.** The Abbieville/Trailer Village housing area is currently in use in support of staff. As noted, only portions of the area are located within the floodplain, and the margin of the floodplain is located in close proximity to these areas. Therefore, affected areas could be easily evacuated in the event of a potential flood. These facilities would not be removed.

### ***South Fork Merced River***

**Yosemite Transportation Company Office.** This facility is currently in use and supports operations and management of transportation services and transportation infrastructure within the Park. The facility is located in close proximity to the margin of the floodplain, and could be easily evacuated in the event of a potential flood. Therefore, the facility would not be removed from the floodplain.

**Historic Facilities (Wawona Covered Bridge, portions of the Pioneer Yosemite History Center).** These facilities would not be removed because they are important contributing elements to the Yosemite Valley cultural landscape. Their removal or demolition would result in an adverse effect on historic resources. Therefore, these facilities would not be removed.

**Utility Buildings.** The existing utility buildings are critical to the function of existing infrastructure within the area. Unmanned, potential flooding of the facilities does not represent a substantial risk to humans. Therefore, the facility would not be removed from the floodplain.

**Ranger Station and Bakery Building.** These facilities are currently in use and provide useful or required services within the area. They are located in relatively close proximity to the margin of the floodplain, and could be easily evacuated in the event of a potential flood. Therefore, these facilities would not be removed from the floodplain.

**Wawona Campground and the South Fork Wawona Picnic Area.** Portions of these areas are located within the floodplain. These facilities result in only minor to minimal interference with potential flood flows, are currently in use, could be easily evacuated or closed in the event of a potential flood, and afford unique camping and picnicking experiences in the Wawona area. These facilities would not be removed from the floodplain.

## **DESCRIPTION OF SITE-SPECIFIC FLOOD RISK**

### **Merced River above Nevada Fall**

Floods of consequence along the Merced River above Nevada Fall, including Little Yosemite Valley and the upper canyon, always occur with some warning, although flood conditions may occur more immediately than in the Yosemite Valley downstream. Risks to humans can typically be mitigated by warning and evacuation.

**High Sierra Camp Reduction to 11 Units.** Remaining units would presumably be subject to periodic inundation during 100-year flood events. During a major flood event, these units could become inundated with floodwaters. This could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans related to potential risk of inundation. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the camp facilities during intermittent flood events. Flooding of



sufficient depth could damage existing facilities and result in minor and intermittent additional maintenance requirements to repair flood damage.

## Yosemite Valley

In Yosemite Valley, the character of flooding varies in different locations because of local hydraulic controls. From Clark's Bridge to Housekeeping Camp in the east Valley, the Merced River floods areas outside the main river channel with shallow, swift flows that cut across meander bends. Near Yosemite Lodge and downstream to the El Capitan moraine, flood waters back up against the moraine and dense vegetation. Flood waters in this area are of low velocity and significant depths. At Housekeeping Camp, velocities are relatively higher with lower depths.

The historic discharge in the river, measured at the Pohono Bridge gauging station, has ranged from a high of about 25,000 cubic feet per second to a low of less than 10 cubic feet per second. The mean daily discharge rate is about 600 cubic feet per second. The following discussion provides information about potential risks of continued floodplain use for each of the facilities that would remain within the floodplain.

**Ahwahnee Row Houses.** Flooding within Yosemite Valley including in the area of the Ahwahnee Row Houses requires a prolonged period of intense rain for at least 24 hours to create flood conditions. During a major flood event, the Ahwahnee Row Houses could become inundated with floodwaters. This could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans related to potential risk of inundation. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the row houses during intermittent flood events. Flooding of sufficient depth could damage existing facilities and result in minor and intermittent additional maintenance requirements to repair flood damage.

**Tecoya Dorms and Other/Concessioner Housing in the Vicinity of Indian Creek (apartments and single-family residences).** As discussed previously, flooding within Yosemite Valley including in this area requires a prolonged period of intense rain for at least 24 hours to create flood conditions. During a major flood event, these facilities could become inundated with floodwaters. This could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans related to potential risk of inundation. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the housing during intermittent flood events. Flooding of sufficient depth could damage existing facilities and result in minor and intermittent additional maintenance requirements to repair flood damage.

**Yosemite Lodge Area Facilities (overnight units, parking, laundry building, lost and found, security building, Concessioner Valley Fire House, Superintendent's House, Yosemite Creek Sewage Lift Station, groundwater wells near Yosemite Creek, four lodging buildings at Yosemite Lodge, three housing buildings near Yosemite Lodge (Thousand Cabins)).** As discussed previously, flooding within Yosemite Valley including in the area of Yosemite Lodge requires a prolonged period of intense rain for at least 24 hours to create flood conditions. Also, these existing facilities that are located within the floodplain are located close to the edge of the 100-year floodplain. Therefore, water depth during a 100-year flood event is expected to be relatively shallow. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans related to potential risk of inundation. However, given the nature of flooding in the Yosemite Valley, which has a relatively slow onset with sufficient time for warning and evacuation, it is anticipated that evacuation of these facilities could be completed easily. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the facilities during intermittent flood events. Flooding of sufficient depth could damage existing facilities and result in minor and intermittent additional maintenance requirements to repair flood damage.

**Housekeeping Camp (232 units, shower houses, restrooms, laundry facilities).** Facilities at housekeeping camp are available seasonally, and are closed for overnight use during the winter, the period when most major precipitation based flooding events occur. When flooding within Yosemite Valley does occur, it requires a prolonged period of intense rain for at least 24 hours to create flood conditions, which provides sufficient time for evacuation. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans related to potential risk of inundation. However, risk of interference with human activities is limited due to winter period closure of Housekeeping Camp. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the grounds during intermittent flood events. Flooding of sufficient depth or velocity could damage existing facilities and result in minor and intermittent additional maintenance requirements to repair flood damage.

**Yosemite Valley Campgrounds (North Pines, Backpackers, portions of Lower Pines, Upper Pines, and Yellow Pine Administrative Campground, plus new camping facilities (30 walk-in camp sites) at Upper River Campground and near Upper Pines Campground).** Facilities at other campgrounds that are or would be located within the floodplain are closed for overnight use during the winter, the period when most major precipitation based flooding events occur. When flooding within Yosemite Valley does occur, it requires a prolonged period of intense rain for at least 24 hours to create flood conditions, which provides sufficient time for evacuation. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, risk of interference with human activities is limited due to winter period closure of the campgrounds. With respect to natural resource values, continued

presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the campgrounds during intermittent flood events. Flooding of sufficient depth or velocity could damage existing facilities and result in minor and intermittent additional maintenance requirements to repair flood damage.

**Concessioner Stable.** Flooding events are most likely to occur within this area during the winter, wherein flooding requires a prolonged period of intense rain for at least 24 hours to create flood conditions. This provides sufficient time for evacuation of the area. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. Additionally, potential flood events would require evacuation of any animals located at the facilities, if present. It is anticipated that sufficient time would be available in order to enable evacuation of humans and animals in the event of a potential flood. With respect to natural resource values, the existing stables would interfere somewhat with flood flows, but would not be anticipated to result in a substantial backup of water or constriction of the floodway, such that major deleterious effects would be generated during a flood event. During a flood event, the facilities could sustain damage, depending upon the depth of flooding, thereby requiring additional maintenance and upkeep following a flood event.

**Yosemite Village Day-use Parking Area and Rerouting of Northside Drive.** Flooding events are most likely to occur within this area during the winter, wherein flooding requires a prolonged period of intense rain for at least 24 hours to create flood conditions. This provides sufficient time for evacuation of the area. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. With respect to natural resource values, the parking lot and roadway would be reconstructed so as to minimize interference with floodplains, and would not include the construction of any major buildings or other facilities that would interfere with flood flows. Additionally, the parking area would be designed to handle periodic inundation, thereby minimizing erosion and other potential damage to parking facilities that could otherwise occur as a result of flooding.

**Lower River Amphitheater.** Flooding events are most likely to occur within this area during the winter, wherein flooding requires a prolonged period of intense rain for at least 24 hours to create flood conditions. While visitors and staff would utilize this facility, use would be transitory, due to the nature of the facility. This, combined with a relatively extended period of warning for flooding in the area provides sufficient time for evacuation of the area. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, such risks would be avoided by evacuation. With respect to natural resource values, the existing facilities would interfere only minimally with flood flows, and would not result in a major construction or interference. During a flood event, the facilities could sustain minimal damage, depending upon the depth of flooding, thereby requiring additional maintenance and upkeep following a flood event.

**West Valley Picnic Areas.** Similar to other areas of the Yosemite Valley, flooding events are most likely to occur within this area during the winter, wherein flooding requires a prolonged period of intense rain for at least 24 hours to create flood conditions. Picnic areas are used for short periods by Park visitors. Therefore, along with a relatively extended period of warning for flooding in the area, it is anticipated that sufficient time for evacuation of the area would be available in the event of a potential flood. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, risks to humans would be avoided by evacuation. With respect to natural resource values, the existing facilities would interfere somewhat with flood flows, but would not be anticipated to result in a substantial backup of water or constriction of the floodway, such that major deleterious effects would be generated during a flood event. During a flood event, the facilities could sustain minimal to minor damage, depending upon the depth of flooding, thereby requiring additional maintenance and upkeep following a flood event.

**Gauging Station near Pohono Bridge.** Flooding in this area would occur in a manner that is similar to the other facilities noted above – primarily during winter flood events. The gauging station is small in extent and does not present a major interference with natural flood flows. Additionally, the facility is unmanned and would not require evacuation. During a flood event, it is anticipated that the facility would sustain only minimal potential damage as a result of flooding.

## **Merced River Gorge and El Portal**

The El Portal area is located in an extremely high energy, bedrock-controlled reach with little high floodplain suitable for development. Due to high flood velocities, infrastructure and developments must be located above flood levels or be massively armored. Evacuation of flood-prone areas should be mandatory during flood events of any appreciable size.

**Facilities near Old El Portal (AT&T Building, NatureBridge office and employee housing, water valve station), as well as the El Portal Market Building and the El Portal Gas Station.** These facilities are subject to year-round use, and are located near the margin of the floodplain. Therefore, flood water depths within these areas are expected to be minor to moderate, with areas suitable for evacuation located within a few hundred feet or less. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, it is anticipated that sufficient warning would be available to enable evacuation. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during major flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the facilities during intermittent flood events. Flooding of sufficient depth or velocity could damage existing facilities, while floating debris could result in damage to structures and facilities. Flood flows in this area are generally anticipated to be faster-moving than within the Yosemite Valley, which could exacerbate potential for damage to

buildings and facilities, while floating debris could result in damage to structures and facilities. Damage would require maintenance and repair once flood flows recede.

**Administrative Parking Area (between Foresta Road and the Merced River at the National Park Service's Warehouse and Administrative Complex).** The parking area is subject to year-round use, and is located near the margin of the floodplain. Similar to other facilities in this area, suitable evacuation areas are located within a few hundred feet of the facility. During a major flood event, the parking lot could become inundated with floodwaters. Inundation could interfere with human access and use of the area, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, it is anticipated that sufficient warning would be available to enable evacuation. With respect to natural resource values, continued presence of the facilities within the floodplain would minimally interfere with flood flows and floodplain hydrology during major flood events. With respect to investment values, continued presence of the facilities within the floodplain could result in periodic inundation of the lot during intermittent flood events. However, only minimal damage is anticipated to result from such events.

**Temporary El Portal Special Park Uses Trailers.** These facilities are subject to year-round use, and are located near the margin of the floodplain. Similar to other facilities in this area, suitable evacuation areas are located within a few hundred feet of the facilities, and it is anticipated that the facilities would be evacuated in advance of an anticipated flood. During a major flood event, the trailers could become inundated with floodwaters. Inundation could interfere with human access and use of the area, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, it is anticipated that sufficient warning would be available to enable evacuation. Additionally, if flood waters are sufficiently high and fast moving, trailers could potentially sustain minor to considerable flood damage. With respect to natural resource values, continued presence of the facilities within the floodplain would minimally interfere with flood flows and floodplain hydrology during major flood events. With respect to investment values, continued presence of the facilities within the floodplain could result in periodic inundation and damage to the trailers during flood events. This could result in need for minor to extensive repairs following each flood event.

**Embankment/Levee between El Portal Market and Gas Station and the Merced River.** This unoccupied facility is subject to inundation during major flood events. Hazardous conditions for humans are not anticipated as a result of flooding of the embankment. In the event of a major flood event with fast moving waters, the facility could sustain minor to moderate damage due to erosive forces. With respect to natural resource values, the embankment would continue to interfere with natural flood flows along the river, resulting in a continued deleterious effect on floodplain processes. With respect to investment values, the facility could sustain damage during a flood event, which would require maintenance and repair following the event. However, the facility also provides partial protection to nearby buildings, including the gas station and store, and its presence is likely to reduce potential damage to those buildings, especially during flood events that are smaller than 100-year events.

**Abbieville/Trailer Village Employee Housing Area.** Portions of this area are subject to flooding during a 100-year event, as noted previously. These facilities are located near the margin of the floodplain. Similar to other facilities in this area, suitable evacuation areas are located within a few

hundred feet of the facilities, and it is anticipated that the facilities would be evacuated in advance of an anticipated flood. During a major flood event, housing areas could become inundated with floodwaters. Inundation could interfere with human access and use of the area, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, it is anticipated that sufficient warning would be available to enable evacuation. Additionally, if flood waters are sufficiently high and fast moving, the facilities could potentially sustain flood damage. With respect to natural resource values, continued presence of the facilities within the floodplain would interfere with flood flows and floodplain hydrology during major flood events, but would not cause major disruptions or constrictions of natural flood flows. With respect to investment values, continued presence of the facilities within the floodplain could result in periodic inundation and damage to the housing areas during flood events. This could result in need for minor to extensive repairs following each flood event.

### **South Fork Merced River**

Floods of consequence in Wawona along the South Fork always occur with some warning. It takes a prolonged period of intense rain for at least 24 hours to create flood conditions. Risks to humans can typically be mitigated by warning and evacuation.

**Historic Facilities (Wawona Covered Bridge, portions of the Pioneer Yosemite History Center).** These facilities are subject to year-round use. Like other facilities at Wawona, these historic facilities are located within several hundred feet of the margin of the floodplain. Areas suitable for evacuation are located in adjacent areas, just outside of the floodplain. During a major flood event, these facilities could become inundated or partially inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, the facilities would be evacuated in the event of a potential or anticipated flood, thereby avoiding effects on humans. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor to moderate disruptions to flood flows and floodplain hydrology during major flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the facilities during intermittent flood events. Flooding of sufficient depth or velocity could damage existing facilities, while floating debris could result in damage to structures and facilities, requiring additional repair and maintenance.

**Yosemite Transportation Company Office.** The Transportation Company Office is subject to year-round use. The facility is located within several hundred feet of the margin of the floodplain. Areas suitable for evacuation are located in Wawona, just outside of the floodplain. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. With respect to natural resource values, continued presence of the facilities within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during major flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the facilities during intermittent flood events. Flooding of sufficient depth or velocity could damage existing

facilities, while floating debris could result in damage to structures and facilities, requiring additional repair and maintenance.

**Utility Buildings.** These facilities could become inundated during a major flood event. Direct consequences to humans would be minimal, because the facilities are unmanned, and would not require evacuation. With respect to natural resource values, continued presence of the buildings within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during major flood events. With respect to investment values, continued presence of the utility buildings within the floodplain would result in periodic inundation of the facilities during intermittent flood events. Flooding of sufficient depth or velocity could damage existing facilities, while floating debris could result in damage to structures and facilities, requiring additional repair and maintenance.

**Ranger Station and Bakery Building.** The ranger station and bakery building are subject to year-round use, and are located within several hundred feet of the margin of the floodplain. Areas suitable for evacuation are located in adjacent parts of Wawona, just outside of the floodplain. During a major flood event, these facilities could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, the facilities would be evacuated in the event of a potential or anticipated flood, thereby avoiding such risks. With respect to natural resource values, continued presence of the buildings within the floodplain would result in continued minor disruptions to flood flows and floodplain hydrology during major flood events. With respect to investment values, continued presence of the facilities within the floodplain would result in periodic inundation of the facilities during intermittent flood events. Flooding of sufficient depth or velocity could damage existing facilities, while floating debris could result in damage to structures and facilities, requiring additional repair and maintenance.

**Wawona Campground and the South Fork Wawona Picnic Area.** Like other facilities noted for Wawona that would remain in the floodplain, the campground and picnic area are located in close proximity to the floodplain margin. Therefore, suitable evacuation areas are located within several hundred feet of these facilities. During a major flood event, the campground and picnic area could become inundated with floodwaters. Inundation could interfere with human access and use of the facilities, and could cause potentially hazardous conditions for humans due to potential risk of inundation. However, the facilities would be evacuated in the event of a potential or anticipated flood, thereby avoiding such risks. With respect to natural resource values, the existing campgrounds and picnic areas are expected to cause only very minimal interference with flood flows and floodplain hydrology, and would not substantially interfere with or redirect flood flows. With respect to investment values, continued presence of the campground and picnic area within the floodplain would result in periodic inundation of the facilities during intermittent flood events. Flooding of sufficient depth or velocity could cause minor damage existing facilities, requiring additional repair and maintenance.

## **DESIGN OR MODIFICATIONS TO MINIMIZE HARM TO FLOODPLAIN VALUES OR RISKS TO LIFE AND PROPERTY**

### **General Mitigation**

The design of all new structures or substantial improvements to existing structures would incorporate requirements and methods for minimizing flood damage, as contained in the National Flood Insurance Program “Floodplain Management Criteria for Flood-Prone Areas” (CFR 44, 60.3) and in accordance with any local, county, or state requirements for flood-prone areas. Furthermore, park staff would maintain an active flood evacuation plan. The plan details responsibilities of individual park employees for advanced preparedness measures; removing or securing park property; records and utility systems; monitoring communication; and conducting rescue and salvage operations. New roadways and traffic circles would be designed so as to minimize interference with floodplains by avoiding areas within floodplains, to the extent practicable, and by adhering to NPS, local, county, and state requirements for the construction of roadways within floodplains. Thus, impacts on the site’s resources would be minimized and avoided. The proposed floodplain related facilities upgrades that would occur under the Preferred Alternative (discussed above) would also support reduced flood risk and reduced potential for inundation of facilities during flood events, as compared to the No Action Alternative.

### **Site-Specific Mitigation – No Subsequent Statement of Findings Necessary**

Merced River above Nevada Fall: High Sierra Camp Reduction to 11 Units.

- Plans would be made for timely and safe evacuation of people the remaining units in times of rising water. These areas would be evacuated prior to major storm events that could potentially produce flooding, based on ongoing monitoring within the Park. Therefore, risks to humans would be mitigated by monitoring of storm or potential storm conditions, warning, and evacuation as warranted.
- In order to minimize potential damage to facilities located within the floodplain, prior to an anticipated flood event, removable facilities that could be damaged by flooding would be removed and stored outside of the floodplain.
- No mitigation is available to offset the potential minor effects of these facilities on floodplain hydrology during flooding events; however, associated effects would be minor.

Yosemite Valley: Ahwahnee Row Houses, Tecoya Dorms, Yosemite Lodge and parking, Housekeeping Camp Lodging Units, and Other Campgrounds (North Pines, Backpackers, Lower Pines, Yellow Pine Administrative Campground, and Upper River Campground), and the Yosemite Village Day-use Parking Area

- Plans would be made for timely and safe evacuation of people from the Ahwahnee Row houses, Tecoya Dorm/Ahwahnee Row Housing, Yosemite Lodge, Housekeeping Camp, affected campgrounds, and other affected facilities in times of rising water. These areas would be evacuated prior to or during the early phases of major storm events that could potentially



produce flooding, based on ongoing monitoring within the Park. Therefore, risks to humans would be mitigated by monitoring of storm or potential storm conditions, warning, and evacuation as warranted. Given that flooding within Yosemite Valley occurs with at least 24 hours of warning, these facilities could be easily evacuated in the event of an anticipated flood.

- In order to minimize potential damage to facilities located within the floodplain, prior to an anticipated flood event, removable facilities that could be damaged by flooding would be removed and stored outside of the floodplain.
- No mitigation is available to offset the potential minor effects of these facilities on floodplain hydrology during flooding events; however, associated effects would be minor.

Merced River Gorge and El Portal Watershed: Water valve station, El Portal Market building, Nature Bridge buildings, El Portal gas station.

- Plans would be made for timely and safe evacuation of people from the El Portal Market building the Nature Bridge buildings, the fuel storage facility, and gas station. The pump station is unmanned, and therefore evacuation of the pump station would not be required. These areas would be evacuated prior to or during the early phases of major storm events that could potentially produce flooding within the area, based on ongoing monitoring within the Park. Therefore, risks to humans would be mitigated by monitoring of storm or potential storm conditions, warning, and evacuation as warranted. Evacuation would be facilitated by the very close proximity of roadways and other facilities that are located outside of the floodplain. Thus, these facilities could be easily evacuated in the event of an anticipated flood.
- In order to minimize potential damage to facilities located within the floodplain, prior to an anticipated flood event, any removable facilities that could be damaged by flooding would be removed and stored outside of the floodplain. Minor and localized armoring may also be installed so as to minimize potential damage from debris and floodwaters. Residual flood damage would require intermittent minor repairs to the affected facilities.
- No mitigation is available to offset the potential minor effects of these facilities on floodplain hydrology during flooding events; however, associated effects would be minor

South Fork Merced River: Yosemite Transportation Company office, two cabins, historic jail, utility buildings, Ranger Station, and a bakery building

- Plans would be made for timely and safe evacuation of people from these facilities in times of rising water. These areas would be evacuated prior to or during the early phases of major storm events that could potentially produce flooding, based on ongoing monitoring within the Park. Therefore, risks to humans would be mitigated by monitoring of storm or potential storm conditions, warning, and evacuation as warranted. Given that flooding within the vicinity of Wawona occurs with at least 24 hours of warning, and that areas suitable for evacuation are located in the adjacent areas of Wawona, these facilities could be easily evacuated in the event of an anticipated flood.
- In order to minimize potential damage to facilities located within the floodplain, prior to an anticipated flood event, any removable facilities that could be damaged by flooding would be removed and stored outside of the floodplain. Minor and localized armoring may be also

installed so as to minimize potential damage from debris and floodwaters. Residual flood damage would require intermittent minor repairs to the affected facilities.

- No mitigation is available to offset the potential minor effects of these facilities on floodplain hydrology during flooding events; however, associated effects would be minor.

### **Site-Specific Mitigation – Subsequent Statement of Findings Necessary**

None Warranted

## **CONCLUSION**

The Preferred Alternative would substantially reduce potentially hazardous conditions associated with flooding by removing existing campground sites within 100-feet of the ordinary high water mark. Facilities that would be removed from highly flood-prone areas include lodging units at Housekeeping Camp, abandoned infrastructure at Upper and Lower River Campgrounds, and removal of campsites at Backpackers Camp, Lower Pines, and North Pines Campground. The Preferred Alternative would also prohibit new development within 150 feet of the ordinary high water mark of the Merced River. The Preferred Alternative would also involve removal of housing units at the Yosemite Lodge which are currently located within the floodplain. Removal of these facilities from the vicinity of the ordinary high water mark and/or the floodplain would reduce existing effects of these facilities on floodplain hydrology, and would support increased safety and reduced flood related hazards for park employees and visitors.

The Preferred Alternative would also include removal and mitigation of existing obstructions along the river, including Sugar Pine Bridge, Odger's Fuel Storage Facility, and the Old Wastewater Treatment Plant in El Portal. Channel complexity would be substantially improved in Yosemite Valley and thereby lessen existing floodplain effects of other existing bridges. These changes would also support minimization of existing floodplain and flooding effects along the Merced River. Installation of logs and logjams along the Merced River could result in minor increases in flooding in select localized areas; however, such effects are anticipated to be minimal and locally beneficial.

The National Park Service has determined that the following structures must remain within the regulatory floodplain (no practicable alternatives to this action): Yosemite Valley: Ahwahnee Row and Tecoya Dorm housing, Yosemite Lodge facilities that are located within the floodplain, Housekeeping Camp, and campgrounds including North Pines, Backpackers, and Lower Pines; Merced River Gorge and El Portal Watershed: water valve station, El Portal Market building, and Nature Bridge buildings; South Fork Merced River: Yosemite Transportation Company office, two cabins, historic jail, utility buildings, Ranger Station, and a bakery building. These facilities are not within areas subject to frequent flooding, and with the early warning system and evacuation plan in use, the risk to human safety would be minimized.

The National Park Service concludes that the Preferred Alternative would reduce the impacts of potentially hazardous conditions associated with flooding in the study area. Implementation of the proposed actions along with compliance with regulations and policies to prevent impacts to floodplain

values and loss of property or human life would be strictly adhered to during and after the construction. Individual permits with other federal and cooperating state and local agencies would be obtained prior to construction activities. No long-term adverse impacts would occur from the proposed actions. Therefore, the National Park Service finds the Preferred Alternative to be acceptable under Executive Order 11988 for the protection of floodplains.

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FLOODPLAIN STATEMENT OF FINDINGS  
Merced River Draft Environmental Impact Statement  
Yosemite National Park  
California

Recommended: \_\_\_\_\_  
Superintendent, Yosemite National Park                      Date

Concurred: \_\_\_\_\_  
Chief, Water Resources Division \_\_\_\_\_ Date \_\_\_\_\_

Concurred: \_\_\_\_\_  
Regional Safety Officer, Pacific West Region Date

The above signatures certify that this document is technically adequate and consistent with NPS policy.

Approved: \_\_\_\_\_  
Director, Pacific West Region

\_\_\_\_\_ Date

**APPENDIX E**

**PROPOSED RESTORATION ACTIONS**

## APPENDIX E

### ECOLOGICAL RESTORATION ACTIONS WITHIN THE MERCED RIVER WILD AND SCENIC RIVER CORRIDOR

#### INTRODUCTION

This report presents an ecological restoration plan to support the Merced Wild and Scenic River Comprehensive Management Plan (Merced River Plan). It provides a description of sites recommended for ecological restoration. The following restoration actions protect and enhance the biological, hydrologic/geologic and cultural Outstandingly Remarkable Values (ORVs) as well as free-flowing condition and water quality, collectively referred to as River Values in the Merced River Plan. The Scenic ORVs are addressed in a separate appendix on scenic vista management actions (Appendix I). A detailed map series showing the locations and types of restoration actions proposed follows this *Proposed Restoration Actions Appendix*. Chapter 5 of the Merced River Plan describes these River Values and provides background information pertaining to the justification for the work described in this appendix.

The Biological ORV actions cover meadow and riparian habitat. These habitats are sites of exceptional ecological importance and occupy the ecotone between terrestrial and aquatic ecosystems (Mitsch and Gosselink 2007). These habitats are integral to a healthy riverine ecosystem and are connected to the river through the active floodplain. When the floodplain becomes inundated during spring snow melt, soils become saturated, nutrients are redistributed and wetland and riparian plants adapted to this dynamic environment thrive. The wide range of hydrologic conditions in this zone leads to diverse plant communities that provide food and shelter for wildlife along the river. Although riparian and meadow ecosystems occupy relatively little land area in Yosemite National Park, they comprise the most biologically diverse areas and are priorities for ecological restoration (Hall 1997). While highly productive and diverse, riparian and aquatic systems (including meadows) are the most impacted areas in the Sierra Nevada (SNEP 1996) and declining spatial extent and condition of riparian and wet meadow ecosystems is occurring throughout California at an alarming rate (SNEP 1996).

The Hydrologic/Geologic ORV actions describe ways of protecting and enhancing the meandering alluvial river system. Due to systematic removal of large wood from the channel, loss of riparian vegetation and subsequent bank erosion caused by visitor use, portions of the Merced River channel lack complexity and have become wider and shallower than would naturally occur in an alluvial system. This alters the connectivity of the river to the floodplain, sediment transport dynamics and the meadows and riparian communities that occupy these areas. The actions in this plan call for the restoration of the integral large wood component of the alluvial system, and for comprehensive riverbank restoration.

The free-flowing condition actions describe the removal of impediments to free-flow such as, riprap, revetment, bridges and other infrastructure within the bed and banks of the Merced River, as well as the associated revegetation work. Impediments to free-flow may not always be removed, because they

are necessary to protect important infrastructure. In such instances, this appendix outlines a strategy for improving the river channel complexity surrounding these impediments.

The water quality actions describe ways to reduce the amount of sediment and chemicals potentially reaching the river. While water quality is considered excellent in Yosemite's portion of the Merced River, protective measures would only enhance the Park's ability to maintain this high standard of quality. Protective measures may include reducing the amount of sediment that enters the river from erosion stemming from formal and informal trails and campsites, and removing parking in close proximity to the river.

The Cultural ORV actions include actions to protect and enhance both cultural and ethnographic resources. While seemingly natural to most, the landscape of Yosemite Valley is shaped by both natural and cultural processes. Many of the meadow and riparian species comprising the ethnographic resources are important in the history and ongoing cultural traditions of traditionally associated American Indian tribes and groups. While natural hydrologic processes have shaped the meadow complexes of the Merced River, cultural processes including American Indian burning to promote hunting and gathering have shaped the plant communities. Vista clearing to maintain views of Yosemite's iconic scenery of Yosemite Valley have contributed to the landscape as well. The International Primer on Ecological Restoration (SER 2004) acknowledges the conundrum that can take place on a landscape where natural and cultural processes have shaped the landscape, stating that – "...cultural landscapes or ecosystems have developed under the joint influence of natural processes and human-imposed organization." These systems are interconnected and interrelated. Therefore, a suite of interconnected actions that address both ecological and cultural landscape processes are presented in this appendix.

This restoration plan also addresses actions to protect archeological sites, some of the many types of important tangible resources reflecting thousands of years of cultural connections to the Merced River landscape. Archeological resources are non-renewable, and once they are gone, they are lost forever. While they cannot be restored, they can often be protected and their condition stabilized through certain management actions, such as removing informal and formal trails, campsites, rock rings and graffiti from within the site boundary. Through these means, the interconnected landscape of cultural and natural resources can continue to form touchstones for place-based human history.

## **The Need for Ecological Restoration**

The actions described in this plan are, at times, difficult to tease apart with regards to which river value they protect and enhance. For example, removal of riprap and subsequent revegetation would benefit free-flowing condition, water quality, biological, hydrologic/geologic and cultural river values. As described above, both natural and cultural resources are integral to the ecosystem processes that now exist on the landscape. This appendix uses the term ecological restoration to describe actions that protect and enhance river values.

Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability (SER 2004). The overarching goal of



ecological restoration is not to return to a particular point in time but rather to restore ecosystem processes, structure, and composition (Falk et al. 2006).

This plan identifies ecological restoration actions that involve restoring hydrological processes and the reintroduction of fire back into the ecosystem, where possible (Madej et al. 1991, Cooper and Wolf 2008). In the river corridor, particularly in Yosemite Valley, the need for ecological restoration is apparent due to impacts to meadow function (fragmentation, trampling, and conifer encroachment), decreased meadow size, reduction in the health of California black oak communities, and loss of riparian habitat due to disruptions in both hydrological processes and cultural processes such as the cessation of burning by American Indians. These natural and cultural processes have been hindered by water diversions (such as ditches), channelization (bridges and riprap), road and bridge building, roadside parking, removal of large wood from the river channel, trampling of riverbanks and meadows, introduction of invasive plants and limited opportunities to reintroduce fire on the landscape. These actions have led to changes in hydrologic regime, channelization, river widening, decreased vegetation structural complexity and diversity, a reduction in the extent of meadows, and reduction in habitat quality.

This plan identifies both passive and active ecological restoration actions to restore these natural and cultural processes. Passive restoration actions include fencing and signing sensitive areas. They are intended to halt human impacts and allow natural processes to repair damage. Active restoration actions include brush layering, revegetation, prescribed burning, removal of abandoned infrastructure, placement of large woody debris, road removal, and removal of formal and informal trails in sensitive areas. These actions are intended to stabilize riverbanks, accelerate ecosystem recovery and promote diversity of meadow and riparian habitats, the health of ethnographic resources, and reduction in conifer encroachment in meadows.

## **OVERARCHING GOAL**

*Promote the ability of the Merced River to shape the landscape by reducing impediments to free flow, improving geologic/hydrologic processes, restoring floodplains and meadows, and protecting water quality.*

## **ECOLOGICAL RESTORATION GOALS**

Ecological restoration addresses the National Park Service mission to allow natural processes to prevail, as well as protecting scenery and historic resources; it also addresses the goals of the Wild and Scenic Rivers Act by enhancing river free-flow, water quality and physical and ecological outstandingly remarkable values. Ecological restoration actions in riparian, riverine, and meadow habitats enhance the open, scenic quality which provides a sense of place for reflection and inspiration.

In addition to the overarching goal noted above, the following are specific goals of this restoration plan:

- Restore hydrologic function and connectivity with the floodplain including meadow and wetland habitats.
- Restore overbank flooding frequency by narrowing widened channels
- Repair eroded riverbanks, restore riparian plant communities and prevent further human-caused, erosion-induced widening.
- Improve hydrologic conditions at severely restricted bridges
- Increase channel complexity by increasing the amount of large wood in the river channel
- Restore and protect the ecological processes that support riparian and meadow communities including naturally high groundwater levels and sheet flow.
- Remove impediments to natural hydrology including ditches, berms, and abandoned roadbeds in order to protect and maintain native plant communities.
- Restore and maintain the function, structure, diversity and productivity of native riparian and meadow plant communities to protect species diversity, ethnobotanical resources and wildlife habitat.
- Protect and enhance the scenic values of meadows and riparian areas, while improving visitor experience
- Protect archeological resources

## **ECOLOGICAL RESTORATION ACTIONS COMMON TO ALTERNATIVES 2-6 (“ACTION ALTERNATIVES”)**

Multiple actions would be taken across all alternatives to restore, protect and enhance hydrologic and ecological processes, free-flowing condition, water quality, and meadows and riparian habitat. A 150 foot riparian buffer, measured from the ordinary high water mark, would be protected and enhanced, corridorwide. This riparian buffer will filter runoff and provide a transition zone between the river and human land use. This riparian buffer will reduce the magnitude and velocity of overland flow, trap sediment, and attenuate compounds such as nitrogen and phosphorous and pathogens. It will help to stabilize riverbanks through provision of root cohesion on banks and floodplains, reduce erosion, and allow surface water to infiltrate the soil. The riparian buffer vegetation will provide a source of large wood to the river and adjacent floodplain, which will dissipate river flow energy and regulate channel form. In terms of habitat, the riparian buffer will enhance important habitat for wildlife by allowing establishment of new vegetation and persistence of a complex habitat structure. The buffer will also protect aquatic ecosystems by providing organic nutrients, by supplying woody debris that will improve habitat complexity, and by moderating water temperatures by vegetative shading of the river. This riparian buffer will protect and enhance river values, and function as a setback for all future development in the corridor.

Throughout the corridor, eroded riverbanks would be repaired through restoration and vulnerable riverbanks and riparian vegetation would be protected from trampling. Visitors would be directed to use resilient riverbanks such as low-angle sandbar beaches. The majority of riprap in Yosemite Valley would be removed to enhance free-flowing condition, natural hydrologic processes and to improve riparian habitat. The large wood management policy would be enforced and large wood would be left in the channel or incorporated into riverbanks as part of restoration to increase channel complexity and improve aquatic habitat. Please refer to *Standard Operating Procedure (SOP): Management of Fallen Trees in the Merced River in Yosemite Valley*, NPS, 2012, for additional detail.

Prescribed burning, conifer seedling removal and invasive plant removal are on-going activities occurring in the corridor that have already been analyzed in other planning documents. Prescribed burning for resource benefits would follow the Fire Management Plan. Prioritization of units to be burned would be developed using an interdisciplinary approach that addresses not only ecological restoration, but also ethnographic resource restoration or protection. Invasive plant removal would follow the guidelines of the *Invasive Plant Management Plan*.

In all alternatives, ditches in meadows would be filled, six miles of informal trails in meadows and riparian areas would be removed, and abandoned underground infrastructure would be removed. Roadside parking along meadows and associated fill material would be removed to restore meadow area and protect meadows from informal trailing. All action alternatives return ecological and cultural processes—hydrology and fire—to restore meadows and oak woodlands from currently conifer-dominated portions of the landscape. To improve riverbank condition, river channel restoration would occur in the reach between Clark's and Sentinel bridges, including placement of constructed log jams (CLJs), closure of sensitive riverbanks, and brush layering. The portion of Lower Pines campground that was damaged by the 1997 flood and subsequently removed would be restored to a mosaic of riparian, meadow and oak communities which would enhance riparian and floodplain habitat. To protect water quality and improve riparian habitat, the pack stock trail between the stables and Happy Isles road bridge would be removed and the riparian zone and restored to natural conditions. In all alternatives, campsites within 100 feet of the ordinary high water mark would be removed to protect and enhance riverbanks and the riparian zone.

Best management practices and mitigations to protect and enhance river values would be common to all alternatives (Appendix D). Restoration actions that address riprap, informal trails, ditching, and abandoned infrastructure would also be common to all alternatives. Some actions to address free flowing conditions and hydrologic processes that are common to all include large wood management, placement of constructed log jams, and other actions to restore eroded riverbanks and provide appropriate river access. Recreational river activity would be directed to designated river access points and all new development would be located at least 150 feet from the ordinary high water mark. The NPS would eliminate unnecessary development and limit the extend of new development in the river corridor, preserve viewpoints and scenic vistas along roadways and trails, and manage vegetation so that it does not interfere with the visitor's visual experience.

Cultural resources such as archeological sites are non-renewable therefore impacts can result in irretrievable loss. For this reason, most actions to protect and enhance archeological resources in the action alternatives of this plan do not have a range across the alternatives.

## All Wild and Scenic River Segments

**Riparian Buffer (RES-AS-005)** – Protect the riparian zone from new development within 150 feet of the ordinary high water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high water mark. The riparian buffer will protect water quality, hydrological processes, aquatic ecosystems, and riparian vegetation.

**Abandoned Infrastructure (RES-AS-001)** – In situations where abandoned underground infrastructure alters hydrology, develop case-by-case treatment strategies that ameliorate the ongoing impacts to hydrologic processes. This infrastructure includes remnants of abandoned sewer treatment facilities, sewer and water lines, and manholes. Treatment would be designed to avoid impacts to sensitive resources (including archeological sites) and may include removal, collapsing in place, plugging, or other measures. See map series at the end of this *Proposed Restoration Actions Appendix*, for known locations. Where infrastructure would be removed or relocated and restored to natural conditions, soils would be decompacted and recontoured, and the area revegetated with appropriate native plants.

**Informal Trails (RES-AS-002)** – Six miles of informal trailing through meadows would be removed and restored to natural conditions. Fencing and signage would direct visitors to less sensitive areas that can accommodate some use without compromising meadow health. Define and delineate accepted trails with closure signs, fencing, and/or other natural barriers such as rocks and logs. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants.

**Conifer Encroachment (RES-AS-003)** – Manually or mechanically remove conifer seedlings and saplings from meadows and under oaks with loppers, handsaws, or mowers.

**Restore eroded riverbanks (RES-AS-004)** – Revegetate areas devoid of vegetation with appropriate native plants. Protect re-vegetated areas using closure signs, fencing, and/or other natural barriers such as rocks and logs as deterrents. Stabilize eroded riverbanks using bio-engineering techniques such as brush layering of willow cuttings.

**Vulnerable riverbanks (RES-AS-006)** – Direct visitor use along the river to stable and resilient access points such as sandy beaches and low-angle slopes through delineated trails, signs, campground maps and brochures; establish fencing and signage to protect sensitive areas. Areas susceptible to erosion—steep riverbanks, and high use areas exhibiting vegetation and soil loss from compaction—would be closed and restored using bioengineering and revegetation techniques.

**Bridges and associated revetments (RES-AS-008)** – Install constructed log jams, and utilize bioengineered stabilization on riprap to improve hydrologic function, reduce bank erosion, and improve riverine habitat. Strategically placed log jams diffuse and direct high velocity flows, a property that makes them a valuable tool to mitigate altered flow regimes around bridges. Log jams, unlike traditional rock revetment reintroduces habitat complexity within the channel by creating additional bars and scour holes, and by providing cover for aquatic organisms. When used in conjunction with a wood retention policy and riverbank revegetation, log jams form part of a comprehensive restoration and mitigation strategy designed to improve the hydrologic function of the Merced River.

**Revetments (RES-AS-009)** – Remove riprap where possible to restore natural river processes. Replace riprap with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.

**Large wood (RES-AS-010)** – Manage large wood according to a management policy, *Standard Operating Procedure (SOP): Management of Fallen Trees in the Merced River in Yosemite Valley*, NPS, 2012, leaving large wood that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality. In developed areas where standing hazard trees must be removed for safety, rather than cutting and removing these trees, fall them into the river. Add engineered log jams in severely widened river reaches.

**Trails through sensitive habitat (NO CODE)** – Re-route trails out of sensitive habitats or install boardwalks through wetlands. New trail routes should avoid wetlands and special status habitat.

## **Segment 1**

**Special status plants: trail impacts (RES-1-004)** – Relocate sections of trail through wetlands in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Re-surface the wet sections of the Mist trail to avoid trail widening. Prevent trail creep along the John Muir Trail using fencing and boardwalks. Hand tools will be used by trail and restoration crews during the late summer and fall and work will occur for up to eight weeks.

**Triple Peak Fork: braided trail through meadows (RES-1-005)** – Reroute the trail to upland area where possible. Hand tools will be used by trail and restoration crews during the late summer and fall and work will occur for up to eight weeks.

**Merced Lake Shore Meadow: informal trails (RES-1-003)** – Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants. Hand tools will be used by trail and restoration crews during the late summer and fall and work will occur for up to eight weeks.

## **Segment 2**

**Ditching in Meadows (RES-2-001)** – Fill 2,155' of ditches not serving current operational needs using adjacent berm material or pond and plug techniques. (see Map Series for precise locations). A mini excavator, skid steer, dozer, dump truck, and loader would be used when water table is low, in the fall season. Work would last up to 8 weeks.

**Road improvements over meadows (RES-2-017)** – Mitigate effects of roads on meadow hydrology with culverts or other engineered solutions that allow unimpeded groundwater flow. Use wide box culverts or other design components such as rolling dips, permeable subgrade, etc. to improve surface water flow. Examples include Southside Drive through Sentinel Meadow and Northside Drive through Cook's and El Capitan Meadows. Work would occur any time after peak flow when the area is not flooded. Heavy equipment including a skid steer, excavator, loader, and dump truck and would take an estimated 6 weeks.

**Informal trails (RES-2-012):** Remove and restore six miles of informal trailing through meadows to natural conditions (Figure 1; map series). Use fencing and signage to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Define and delineate accepted trails with closure signs, fencing, and/or other natural barriers such as rocks and logs. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants. Work would occur for up to 6 weeks in the summer and fall.



**Figure 1:** The park has successfully removed networks of informal trailing in meadows. In this example before (left) and after (right) restoration of Stoneman Meadow, high visitor use was mitigated by adding fencing to direct people to a new boardwalk, which allowed access to the meadow without the associated impacts.

**Valley Meadows: Conifer Encroachment, loss of meadow extent (RES-2-002)** – Improve condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance scenic vistas and maintain the cultural landscape, as well as enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.

**Revetments (RES-AS-007)** – Under all alternatives, 3,400 feet of riprap would be removed and revegetated with riparian species where needed. An additional 2,300 feet would be removed but replaced with bioengineered riverbank stabilization (see map series for precise locations). Work would occur in late summer or fall during low flow. Heavy equipment including a skid steer, excavator, loader, and dump truck and would take an estimated 16 weeks.

**Leidig Meadow: Bike Path (RES-2-015)** – Replace a 1,000 foot section of paved trail that passes through the ordinary high water mark. Heavy equipment (excavator, skid steer, loader, dump truck) would remove asphalt path, fill material, and any plant salvage needed. Work would be done in late summer or fall for approximately six weeks.

**Valley Loop Trail: delineation and river access (RES-2-029)** – Reconstruct trail and designate river access, such as at Housekeeping Camp, Sentinel Beach, Cathedral Beach, Swinging Bridge, in the southwest area of the former River's Campground, and South of Slaughterhouse Meadow.

Re-establish the Valley Loop Trail at Curry Village where it ends. Work would occur in summer or fall. Heavy equipment including a skid steer, excavator, loader, and dump truck and would take an estimated 4 weeks.

**Roadbridge at Happy Isles: free flowing condition (RES-2-058)** – Place large wood in the channel and riverbank to lessen the scouring from the bridge. Use brush layering and place a constructed log jam. Heavy equipment including a skid steer, excavator, loader, and dump truck. Work would be done in late summer or fall for approximately six weeks.

**Sentinel Bridge: free flowing condition (RES-2-059)** – Place large wood in the channel and riverbank to lessen the scouring from the bridge. Use brush layering and place a constructed log jam. Work would be done in late summer or fall for approximately six weeks. Heavy equipment including a skid steer, excavator, loader, and dump truck would be used during late summer and fall.

**Swinging Bridge: free flowing condition (RES-2-060)** – Place large wood in the channel and riverbank to lessen the scouring from the bridge. Use brush layering and place a constructed log jam. Work would occur in late summer and fall and last 3 weeks. Heavy equipment including a skid steer, excavator, loader, and dump truck would be used during late summer and fall.

**Superintendent's Bridge, footbridge, and associated revetments (RES-2-160)** – Install constructed log jams, and utilize bioconstructed stabilization on riprap to improve hydrologic function. Work would be done in late summer or fall for approximately six weeks. Heavy equipment including a skid steer, excavator, loader, and dump truck would be used during late summer and fall.

**Clark's Bridge: free flowing condition (RES-2-054)** – Place large wood to lessen the scouring from the bridge. Use brush layering of willows to stabilize banks and place a constructed log jam in the area. Heavy equipment including a skid steer, excavator, loader, and dump truck would be used and would take an estimated 6 weeks during the late summer or fall.

**Pack stock trail from concessioner stables to Happy Isles (RES-2-143)** – Remove 3,800 feet of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material with an excavator and skid steer, decompact hardened surfaces, recontour surfaces and plant riparian vegetation where needed (Figure 2). Work would occur any time after peak flow when the area is not flooded. Heavy equipment including a skid steer, excavator, loader, and dump truck and would take an estimated 6 weeks, and revegetation would require an additional two weeks.

**River channel at Lower and North Pines campgrounds** – Repair eroded riverbanks at Lower and North Pines campgrounds with



**Figure 2:** Stock trail in Happy Isles reach passes through riparian habitat. Its hardened surface affects natural hydrologic processes by preventing sediment transport and capture.



bioengineering techniques such as brush layering (Figure 3). Allow vegetation to accrete sediment to rebuild the banks. The erosion at North Pines campground is farther advanced and continuous. In such cases, plant willows further out into the river channel than currently established vegetation using a hydro drill. This project would be implemented in the fall during low flow conditions with duration of up to six weeks. Excavator, skid steer, loader, and dump truck would be used during late summer and fall.



**Figure 3:** Divot caused by river access at Lower Pines Campground where the riverbank is highly vulnerable to erosion at (left). Active restoration by brush layering will stabilize the riverbank, capture sediment to rebuild the bank over time and improve riparian habitat.

**Lower Pine Loop within the bed and banks (ONA-2-007)** – Remove Lower Pine Loop between sites 60 and 62, because it is within the bed and banks of the river. Work would occur any time after peak flow and when the area is not flooded. Revegetation would occur in late summer or fall and take 2 weeks. Heavy equipment including a skid steer, excavator, loader, and dump truck would be used during late summer and fall.

**River reach between Clark’s and Sentinel Bridges: highly impacted riverbanks (RES-2-062)** – To address river widening and low channel complexity, build eight constructed log jams (CLJs) in the channel between Clark’s and Sentinel Bridges. Locations of CLJs are shown in the map series that follows this *Proposed Restoration Actions Appendix*. Logs would be gathered locally including naturally fallen or salvaged hazard trees when available. Coniferous trees with exposed roots along the bank in proximity to the log jam may be pushed over into the river to be incorporated in the constructed log jam. These trees with the root ball still attached at the bank would help to anchor the log jam to the bank. Burying ends of logs into the bank would also be used to anchor the log jam. Localized riverbank erosion would be repaired through brush layering and revegetation of the bank. Heavy equipment such as excavator, dozer, loader, and skid steer would be used to place and secure large wood. Work would occur in the fall during low flow and last for up to twelve weeks. Heavy equipment would access the riverbank from nearby roads, paved bike paths, and former campgrounds with already compacted soils and would not pass through wetlands.

**Swinging Bridge River Access (RES-2-155)** – Remove river access upstream, river-right of Swinging Bridge. Add fencing along bike trail to connect to bridge and revegetate 2,000 square feet of denuded area with riparian species and native grasses. Direct visitor use to a large sandbar directly downstream



of the bridge (Figure 4). Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would take place in late summer or fall for 4 weeks.



**Figure 4:** Current river access point at Swinging Bridge (left) leads to denuded riverbank. River access would instead be directed to the adjacent sandbar (right), which is naturally resilient to visitor use and provides a nice beach for visitor enjoyment.

**Sentinel Beach Picnic Area (RES-2-031)** – Redesign the picnic area to better manage visitor use, and designate the area as a formal river access point, fence off sensitive areas, re-direct use to more resilient areas and reestablish riparian vegetation. Crews would work for four weeks in late summer and fall.

**Indian Creek drainage (RES-2-007)** – Create a buffer zone for the creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would take place in late summer or fall for 4 weeks.

**El Capitan Meadow (RES-2-009)** – Reroute climber use trails on north side of road from meadow habitat to an appropriate upland route (a few meters to the east). Remove informal trails through meadow and oak woodland. Protect re-vegetated areas with fencing or other natural barriers and sign the area to reduce trampling of sensitive meadow vegetation. As opportunities arise through maintenance or restoration projects, improve hydrologic flow and meadow connectivity by extending the permeable road base across the entire segment of Northside Drive through El Capitan Meadow and add additional box culverts with bottom elevations equal to the meadow surface elevation. Remove encroaching conifer saplings (< 10 inches diameter at breast height) using loppers, handsaws, or mowers. Heavy equipment including excavator, skid steer, loader, and dump truck would be used to remove ditches and recontour natural topography. Work would take place in late summer or fall for 10 weeks. Other restoration treatments at El Capitan Meadow vary depending on alternative.

**Sentinel Beach Picnic Area to El Capitan Moraine: Channel complexity (RES-2-061)** – To enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would include willow planting, brush layering, uninhibited accumulation and strategic placement of large wood. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would take place in late summer or fall for 4 weeks.

**Stoneman Meadow** – Slightly expand fenced area to protect wetlands on north end of meadow near Lower Pines Campground. Remove invasive non-native species and encroaching conifers. Remove ditch, fill with native soils, and revegetate. A mini excavator, skid steer, dump truck, and loader would be used when water table is low, in the fall, for eight weeks.

**Bridalveil Meadow: stream headcutting and absence of willows (RES-2-010)** – Address headcuts in stream on west edge of meadow by planting willow cuttings in the impacted area, along riverbank, and adjacent meadow. Reestablish the riparian shrub layer. Manually remove encroaching conifer saplings with loppers, hand saws, or mowers. Restoration would require four weeks crew time, with planting occurring in fall when willow are heading into dormancy or prior to bud swell in the springtime.

**Cook’s Meadow roadbed: abandoned infrastructure (RES-2-011)** – Remove fill of a former road bed north of Northside Drive between the Ranger Club and the three-way stop. Revegetate with native meadow species. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.

**Cook’s Meadow: Informal shoulder parking (RES-2-012)** – Roadside parking along meadow (along both Northside Drive and Sentinel Drive) would be removed and the area restored to meadow conditions (Figure 5). Remove approximately 1,800 cubic feet of fill and revegetate with native seed and transplanted native plants. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used. Work would take six weeks in the late summer or fall.



**Figure 5:** Roadside parking along Cook’s meadow encroaches on meadow. Vegetation is crushed, soils compacted and net area of meadows reduced. All alternatives eliminate informal parking along meadows.

**Leidig Meadow: Informal trailing (RES-2-013)** – Remove informal trails that incise or fragment meadow habitat. Decompress soils and revegetate trampled areas with seed collected from local native meadow plants. Work would occur in late summer or fall over a period of six weeks and a skid steer may be used along with hand tools.

**Rocky Point Sewage Plant: abandoned infrastructure (RES-2-014)** – Remove abandoned infrastructure occupying 9.5-acres at Eagle Creek Meadow. Remove remains of the abandoned Rocky Point Sewage Plant including a two-unit reinforced concrete Imhoff settling tank (55 feet x 78 feet) and remaining asphalt left from the demolition of the concrete sludge drying bed, and circular reinforced chlorinating structure. Any remaining utility pipes would be removed. Re-establish natural landscape contours, including the distribution of ephemeral stream channels. Backfill with native soil and/or rehabilitate disturbed soils and plant with native plant species. This is a phased project with demolition and removal of abandoned infrastructure taking 12 weeks, fill removal, contouring and planting four weeks. Heavy equipment would be used including excavator, loader, dozer, dump truck, and skid steer. Project would be implemented after peak flooding; summer or fall.

**Royal Arches Meadow: abandoned infrastructure (RES-2-016)** – Remove abandoned tiles, pipes and abandoned road. Decompact soils, remove conifers and revegetate with riparian species. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used. Work would last eight weeks in the late summer and fall.

**Sentinel Meadow: Trampling (RES-2-018)** – Add a 150 foot section to the existing boardwalk in order to accommodate visitors and reduce meadow trampling. Substantial trampling is evident along river's edge at north section of the boardwalk. Work would be accomplished in six weeks using a skid steer.

**Western portion of former Lower Pines Campground loop: abandoned infrastructure (RES-2-019)** – Restore 20 acres of the former Lower Pines campground to natural conditions. Remove any remaining asphalt (Figure 6) and decompact soils of former roadbed and campsite footprint using an excavator and loader. Treat invasive plants (velvet grass). Manually thin conifer saplings and trees to allow for a mosaic of deciduous riparian species including alder and cottonwood. Remove tree stumps with an excavator and tub grinder. Restore channel topography using the 1919 maps as a guide. This work would occur over 12 weeks during summer months using heavy equipment including: excavator, dozer, skid steer, loader, dozer, and dump truck.



**Figure 6:** Asphalt remains in former Lower Pines Campground floodplain.

**Devil's Elbow: riverbank erosion (RES-2-020)** – Relocate parking from Devil's elbow to the east of the current parking lot, and delineate a trail to access the large sandbar to the east of the "elbow", river right. Remove informal trails and restore to meadow conditions through soil decompaction and revegetation. Designate river access with appropriate signage. This work would occur up to 12 weeks during summer months using heavy equipment including: excavator, dozer, skid steer, loader, dozer, and dump truck.

**Eagle creek drainage: channelization (RES-2-025)** – Remove berm and parking lot abutting Eagle Creek. Add culverts to allow more dispersed water delivery to the Eagle Creek Meadow. Revegetate with native upland species. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used. Work would last eight weeks in the late summer and fall.

**El Capitan Bridge: River access (RES-2-026)** – Redirect visitors accessing the river near El Capitan Bridge to sandbars. Fence and revegetate eroded areas. This would occur in the summer and /or fall seasons and take two weeks for crew and equipment such as the skid steer.

**Swinging Bridge: Riparian impacts (RES-2-027)** – Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high watermark to reduce soil erosion. Fence off sensitive areas and reestablish riparian vegetation. Revegetate denuded



area with riparian species and native grasses. Remove riprap and use bioengineering techniques to rebuild riverbank. Re-direct visitors to access the large sandbar on the north and downstream side of Swinging Bridge and designate the area as the river access point. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used. Work would last eight weeks in the late summer and fall.

**Valley Swinging Bridge river access (RES-2-155)** – Remove river access upstream, river-right of Swinging Bridge. Add fencing along bike trail to connect to bridge and revegetate 2,000 square feet of denuded area with riparian species and native grasses. Direct visitor use to a large sandbar directly downstream of the bridge (Figure 4). A skid steer would be used and fencing constructed in two weeks time and could occur anytime of the year. Revegetation would occur in fall for a period of two weeks.

**Valley Campgrounds: River Access (RES-2-028)** – Direct visitors staying in Lower and North Pines Campgrounds to resilient sandy beaches through signage and campground maps and brochures. There are four sandy beaches in the vicinity of the campgrounds (Figure 7). Fence off vulnerable steep slope and provide signs directing visitors to current access. This would occur in the summer or fall and require four weeks of crew time with the use of a skid steer.



**Figure 7:** Use of the riverbank at the current river access in Lower Pines Campground has caused vegetation trampling and heavy erosion of this highly susceptible riverbank (left). Use will instead be directed to resilient sandbars such as these, located a short walk downstream (middle and right).

**Yosemite Lodge: former lodge cabin area and volunteer center abandoned infrastructure (RES-2-030)** – Restore 4.5 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins, and Wellness Center located in the western portion of the Lodge complex (those that were damaged by the 1997 flood and subsequently removed). Remove fill, decompact soils and plant riparian plant species. Restoration of this area would be completed at low river flow and would require eight weeks of crew time. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used.

**Sentinel Beach Picnic Area: Riparian impacts (RES-2-031)** – Redesign the picnic area to better manage visitor use and designate the area as a formal river access point, fence off sensitive areas, redirect use to more resilient areas and re-establish riparian vegetation. Restoration of this area would be completed at low river flow during summer and fall and would require eight weeks of crew time. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used.

**Bridalveil Sewer Plant (RES-2-050)** – Remove or demolish buried structures including a 200 foot long and 5 foot deep concrete chlorine contact chamber, aeration tanks, sludge digesters, and drying beds. Backfill with native soil and revegetate with native plants. Remove pipe leading to Black Springs. This work would take place in late summer and fall and would include the use of heavy equipment such as excavator, dozer, skid steer, dump truck, and loader. This work would take place for two seasons for up to eight weeks each year.

**Footings at the former Happy Isles footbridge (beyond gage): free flowing condition (RES-2-056)** – Remove former Happy Isles footbridge footings and former river gage base (steel re-enforced concrete and wet and dry wall masonry). Revegetate denuded areas and improve way-finding between Happy Isles and the Mist Trail from the shuttle stop. Break concrete and masonry into movable pieces using an excavator-mounted jackhammer. Move material offsite with front-end loaders and dump trucks. Recontour and decompact soils and plant appropriate riparian vegetation in all denuded areas. Work would be performed by a contractor at low flow, in the fall, and would take four weeks.

**Pohono Bridge: Infrastructure within the bed and banks (RES-2-057)** – Move the gauging station north of the river outside of the bed and banks of the river. Revegetate denuded areas. Work would occur for one week in the fall and include the use of heavy equipment such as an excavator, dump truck, loader, and skid steer.

**Clarks Bridge to El Capitan Bridge: Large Woody Debris management (RES-2-063)** – Manage large wood according to the management plan, *Standard Operating Procedure (SOP): Management of Fallen Trees in the Merced River in Yosemite Valley*, NPS, 2012. Trees that fall into the river will be retained in the river. Large wood may be minimally manipulated to protect critical infrastructure, to ensure visitor safety, and to prevent unnatural accumulation of wood near bridges.

**Upper Pines: recreational vehicle dump station (RES-2-144)** – Relocate the recreational vehicle dump station from its site proximate to the river to a site between Curry parking and the campgrounds entrance (see Map Series 1). Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used.

**Cathedral Beach: picnic area (RES-2-145)** – Designate area as a formal river access point, fence off sensitive areas, and direct use to most resilient areas. Remove parking in the riparian zone, decompact soils, plant appropriate native vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain, decompact soils, and revegetate. Work can occur any time after peak flow in the upland areas and during low flow of late summer or fall where the water table remains high. Four weeks of crew and equipment time would be needed. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used.

**Yosemite Lodge: Beach Access (RES-2-149)** – Direct visitors to the sandbar at Swinging Bridge. Fence the riparian area at Yosemite Lodge. Fence construction directing use from the Lodge to Swinging Bridge would take one week with the use of a skid steer.

**Ahwahnee Meadow: Former golf course and tennis court (RES-2-151)** – Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions, while allowing special functions, such as weddings to continue on the lawn. Remove the tennis courts from the California black oak

woodland. Restore topography by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow vegetation. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers to return approximately 5.65 acres to meadow habitat. Heavy equipment including excavator, dozer, skid steer, loader, dozer, and dump truck would be used.

**Ethnographic ORV: Impacts to traditionally used plant populations (RES-2-045)** – The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program will address impacts to some traditionally used plant populations in some locations. Conifers that are overtopping black oaks would also be considered for removal.

**Pohono Bridge to Big Oak Flat Road Junction: River Access (RES-2-065)** – Pave and formalize 5 roadside pull-outs for river access between Pohono Bridge and the intersection of the Big Oak Flat Road. Install curbing along pull-outs and along El Portal Road to prevent further encroachment towards the river and associated resource damage. Completely remove one pullout that is not protective of resources. In the areas that require ecological restoration following parking and river access formalization, decompact soil and revegetate with riparian species including willow. Install drainage improvements and head walls at 11 locations. Excavator and skid steer may be used over a period of eight weeks during low water in the fall.

**CA-MRP-0046/47/74 (RES-2-032)** – Reroute stock trail and formal trail off sensitive area, remove graffiti from rock art boulder.

**CA-MRP-0052/H (RES-2-033)** – Delineate or reroute bridle path away from site.

**CA-MRP-0055/H (RES-2-034)** – Remove informal trails and parking pullout. Increase law enforcement and archeology monitoring to protect rock shelter/rock art (best management practices).

**CA-MRP-0057 (RES-2-036)** – Remove graffiti in rock shelter and remove informal trails. Increase law enforcement and monitoring of rock shelter (best management practices).

**CA-MRP-0062 (RES-2-037)** – Remove the logs, graffiti, and informal trails and ecologically restore to natural conditions. Relocate the parking area away from the site.

**CA-MRP-0076 (RES-2-038)** – Remove informal trails, restore to natural condition, and prohibit climbing.

**CA-MRP-0080 (RES-2-039)** - Remove campsite 208 and bear box; reroute bathroom foot traffic away from milling feature and fence off.

**CA-MRP-0082/H (RES-2-040)** – Remove climbing bolts from rockshelter boulder and prohibit climbing. Increase interpretation, education, and outreach efforts for climbers (best management practices).

**CA-MRP-0158/309 (RES-2-041)** – Remove informal trails, restore to natural condition, and prohibit climbing on rock art boulder. Increase interpretation, education, and outreach effort for climbers (best management practices).

**CA-MRP-0190/191 (RES-2-042)** – Delineate trail/bike path to limit shoulder access within site.

**CA-MRP-0240/303/H (RES-2-043)** – Fence off/close access to milling feature next to trail.

**CA-MRP-0902/H (RES-2-152)** – Remove informal trails and restore to natural condition.

### **Segment 3**

**Cascades picnic area: abandoned infrastructure (RES-3-001)** – Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock with skid steer and dump truck. Work would take three weeks in late summer or fall.

### **Segment 4**

**Old El Portal: Soil compaction around Valley oaks from parking (RES-4-002)** – Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline. Designate oak recruitment areas in the Odger's fuel storage area (to be removed from the river corridor in Alternatives 2-6) and the parking lots adjacent to this area. Prohibit new building construction within the oak recruitment area. Remove non-native fill and decompact soils (after development removal); plant appropriate native understory plant species; treat invasive plants. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur in the late summer or fall and take approximately one month.

**El Portal: river confined by rip-rap and road (RES-4-006)** – Develop best management practices for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide CalTrans with best management practices recommendations when repair/replacement is necessary in Segment 4.

**El Portal NPS Maintenance and administrative complex roadside parking (RES-4-007)** – Restore to natural conditions the informal roadside parking, which is southeast of the dirt parking area, between Foresta Road and the Merced River. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur in the late summer or fall and take approximately one month.

**Trailer court: Restore 150 foot riparian buffer** – Remove asphalt and imported fill to restore 9.3 acres in the 150 foot riparian buffer; recontour and plant native riparian species and oaks. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Greenmeyer sandpit: flood and riparian plant impacts from fill material (RES-4-005)** – Restore hydrologic function to 1.8 acres of floodplain and re-establish riparian habitat (Figure 8). Excavate 4,000 cubic feet of angular imported rock, concrete, asphalt and soil which is capping the site to return a floodplain elevation of a 20-50 year flood. Restore upland areas to natural topography, utilizing some



**Figure 8:** Greenmeyer Sandpit current conditions (left) and target braided channel and riparian habitat conditions (middle and right).

of the fill soils which would reduce the amount need to move off-site. Recontour topographic features. Reestablish native vegetation through propagation and planting of local native plants, including *Sambucus mexicanus* (blue elderberry). Retain road for utilities and to allow for river access. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. This is a twelve week project to be performed at low river flow conditions during summer and fall.

**CA-MRP-0250/H (RES-4-003)** – Remove informal trails and non-essential roads.

**CA-MRP-0251/H (RES-4-004)** – Remove informal trails.

**CA-MRP-0181/H (RES-2-049)** – In recognition of the high cultural significance of CA-MRP-0181/H for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.

## Segment 5

**CA-MRP-0218 (RES-5-001)** – Remove informal trails and charcoal rings.

## Segment 6

**Wawona Impoundment: effects to free-flowing condition (RES-6-001)** – Retain current water collection and distribution system, implementing the water conservation plan related to the minimum flow analysis for the South Fork.

**Wawona: arch district impacts (RES-MS-001)** – Increase monitoring frequency for affected sites, Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the district-wide level, amend National Register of Historic Places nomination to reflect district changes and impacts.



## **Segment 7**

**South Fork side channels: Abandoned infrastructure (RES-7-005)** – Remove abandoned metal pipes that dewater the terrace using skid steer, excavator, dump truck and loader for one week.

**Wawona Campground: septic system (RES-7-006)** – Develop a waste water collection system. Build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Wawona dump station: proximity to river (RES-7-007)** – Relocate the dump site to the Wawona Campground away from the river. Design and construct RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the river's ordinary high water mark. After the existing dump station is removed, revegetate the area with native plants. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately three weeks.

**South Fork Wawona picnic area: river access and water quality (RES-7-008)** – Delineate picnic area and a path to the river to encourage visitors to use more resilient areas. One week crew time at low flow would be needed.

**Wawona picnic area: river access and water quality (RES-7-009)** – Harden the three steep river access points using rockwork or staircase construction to prevent further erosion. If needed, place fencing to direct visitors to these hardened access points. Add path to river that encourages visitors to walk in the more resilient areas. Work would be performed for two weeks after peak water flow with an excavator and skid steer.

**Wawona Maintenance yard: Riparian Impacts (FAC-7-001)** – Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer and restore a native ecosystem. Provide a 150-foot wide restoration buffer. Work would be performed for two weeks after peak water flow with an excavator and skid steer.

**CA-MRP-0374 (RES-7-001)** – Remove informal trail, delineates access road, and reduce hazard fuels.

**CA-MRP-0008/H (RES-7-002)** - Remove informal trails. Relocate camp sites out of archeological site. Also, relocate the campground to the Wawona Stables.

**CA-MRP-0171172/254/516/H (RES-7-012)** - Remove informal trails and shoulder and off-road parking.

**CA-MRP-0168/0329/H (RES-7-003)** – Remove 7 campsites from Wawona Campground that cause potential impacts to the archeological site.

**Wawona: arch district impacts (RES-MS-001)** – Increase monitoring frequency for affected sites, Increase management protection designed to counteract or minimize impacts, crafted to individual site

specifications. At the district-wide level, amend National Register of Historic Places nomination to reflect district changes and impacts.

## ECOLOGICAL RESTORATION ACTIONS WITHIN ALTERNATIVES

There is a varying degree of ecological restoration associated with the removal of infrastructure such as roads and bridges within the range of action alternatives (see Table E-1 below). In Alternative 6, all roads and bridges would be retained and their impacts on hydrology and free-flowing condition are addressed through engineered solutions such as placing culverts under roads that bisect meadows and placing engineered log jams adjacent to bridges to ameliorate scour pool formation. In Alternative 5, Sugar Pine Bridge, the bridge causing the greatest hydrologic restriction, would be removed. In Alternatives 2, 3, and 4, Sugar Pine and Ahwahnee Bridges and the berm connecting them would be removed, greatly enhancing free-flowing condition and hydrologic function of this river reach. Stoneman Bridge would be removed in addition to Sugar Pine and Ahwahnee Bridges in Alternatives 2 and 3 to further enhance free-flowing conditions. In Alternative 5, further study would be undertaken to assess the potential costs and benefits of removal of the road segment through Stoneman Meadow. No permanent structures would be built that would preclude a future reroute of this road to the south of the meadow. Alternative 4 would remove the road segment that bisects Stoneman Meadow, but retains the segment of road that bisects Ahwahnee Meadow. Alternatives 2 and 3 would remove the road through Stoneman Meadow and Ahwahnee Meadow to restore 2.7 acres of wet meadow and restore hydrologic connectivity to the meadows. Roads through other meadows such as El Capitan, Cook's and Sentinel would not be rerouted but rather improvements in the road made, such as placement of additional culverts and addition of permeable road base to better connect hydrologic flow.

**TABLE E-1: AREA (ACRES) OF ECOLOGICAL RESTORATION PROPOSED AS ACTIONS COMMON TO ALL ALTERNATIVES (CTA) AND BY ALTERNATIVE (ACREAGE REPORTED IN EACH ALTERNATIVE INCLUDES ACTIONS COMMON TO ALL)**

Alt	CTA	2	3	4	5	6
Meadow, Riparian and Floodplain Restoration	164	347	302	223	203	170

The site of the former Upper and Lower Rivers Campgrounds has a range of restoration options within the action alternatives. Alternatives 2 and 3 would provide for the greatest degree of ecological restoration, fully restoring the area to a mosaic of riparian, floodplain, meadow and oak woodland habitat. In these alternatives, the road bisecting the area and Ahwahnee Meadow is removed, allowing for maximum potential for the river to reshape the landscape, unimpeded. Natural topography, including side channels, would be restored to natural conditions. In Alternatives 4, 5, and 6, the road would remain and camping and day use added. The riparian buffer outside of the campground would be restored to natural conditions in Alternatives 2-6.

The greatest need for river channel restoration occurs in the vicinity of the campgrounds and Housekeeping Camp where the greatest channel widening has occurred. Because riverbanks along the

former Upper Rivers Campground are not resilient river access points, they need protection from trampling. The lower number of visitors in Alternatives 2 and 3 due to lack of road access and camping would be protective of these riverbanks. In Alternatives 4, 5, and 6, riverbanks would be closed, fenced and signed to prevent vegetation damage and riverbank erosion. River use would be directed across the road, to the large sandbar beach at Lower Rivers. In Alternatives 5 and 6, river access would also be available across from the Ahwahnee Bridge, which would remain in place under these alternatives.

Current parking at Yosemite Village Day Use Parking (Camp 6) and the Curry Orchard Parking Area are re-evaluated in this plan. There are two options within the Alternatives for restoration at Camp 6. In Alternatives 4, 5 and 6, the footprint of the current parking lot would be pulled back from the river at least 150 feet from the ordinary high water mark, allowing for riparian restoration and future protection. In Alternatives 2 and 3, all parking and roads would be moved out of the 10-year floodplain, which would allow for riparian restoration as well as restoration of the active floodplain and allow future potential for the river to reshape the land. These alternatives ecologically restore a larger portion of this dynamic floodplain area. Storm run-off mitigations would be used in all alternatives to protect water quality. Actions at the Curry Orchard Parking Area range from major ecological restoration to minimal change. In Alternatives 5 and 6, the area would remain designated parking and limited restoration would occur. In Alternative 3 and 4, most of the parking lot would remain while the northern portion would be restored to natural conditions. In Alternative 2, the parking footprint at this location remains similar to existing conditions, but areas to the north and east are restored when road segments are removed. In all alternatives, the apple trees would be removed to mitigate human-bear encounters and these areas would be revegetated with native species.

There is a range of options within the alternatives for restoring riparian and floodplain habitat at Housekeeping Camp. In Alternatives 5 and 6, 34 structures that are within the modeled ordinary high water mark are removed and riparian habitat restored. Under Alternative 4, 166 structures—those within the observed high water of 2010 and 2011—are removed, resulting in a larger area for restoration. A much larger riparian zone would be restored and channel complexity restored in the active floodplain. Day use in this area increases in this alternative and visitors would be directed to the sandbar beaches. Alternatives 2 and 3 provide for the greatest restoration opportunity with the removal of all lodging units. Riparian habitat and the 10-year floodplain would be restored allowing the greatest level of unimpeded river processes. Alternative 2 and 3 retain a restroom and a small parking lot in the highest elevations to provide for day use picnicking. In all alternatives, current access on the steep, eroding slope on the eastern side would be closed and restored and all river access directed to the sandbar on the western side or to the north side of Housekeeping Bridge.

Campsites in close proximity to the river in Wawona and Yosemite Valley are also addressed in Alternatives 2-6. In Alternatives 5 and 6, sites within 100 feet of the river are removed and riparian habitat restored. In Alternatives 3 and 4, the setback is 150 feet. All sites in the 100-year floodplain are removed and restored to natural conditions in Alternative 2. This entails removal of all of North Pines campground and full restoration of a dynamic floodplain.

At the Yosemite Lodge complex, areas west of the lodge where former lodging units were removed following damage from the 1997 flood would be restored to natural condition. This action is common to Alternatives 2-6. Much of this area is frequently flooded and supports riparian vegetation. In

Alternative 3, 4 buildings in the floodplain are removed and the area restored to natural conditions. Alternative 2 removes all infrastructure in the 100-year floodplain and restores the greatest area of floodplain habitat.

## Alternative 2

This alternative was designed to restore much of the 100-year floodplain. Roads over meadows and bridges impacting free-flowing condition are removed and restored to natural conditions. This alternative includes restoration of more than 347 acres of riparian, meadows and upland habitat within the river corridor. It removes development including campsites, informal trails, and non-essential roads from sensitive areas.

### *Segment 1*

**Merced Lake Ranger Station Meadow: grazing (RES-1-002)** – Remove the meadow from grazing permanently. Require all administrative pack stock passing through the Merced Lake area to carry pellet feed.

### *Segment 2*

**Ahwahnee Row and Tecoya Housing: 100-yr. floodplain (RES-2-007)** – After removal of housing, decompact soils, recontour topography (using 1919 maps as a guide) and plant native meadow vegetation. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used for eight weeks in the late summer and fall.

**Yosemite Lodge: buildings in the 100-year floodplain (RES-2-024)** – Restore 28 acres of floodplain and riparian habitat after removal of all Yosemite Lodge buildings in the 100-year floodplain. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used for eight weeks in the late summer and fall.

**Ahwahnee Meadow: Northside Drive and bike path impact hydrology and meadow extent (RES-2-004)** – Remove the road from Camp 6 intersection to Southside Drive to restore 0.9 acre of wet meadow and improve meadow hydrology and 0.7 acres of California black oak habitat. Remove 12,500 cubic yards of asphalt and imported fill material and recontour to natural topography and restore natural hydrology. Revegetate meadow through propagation and seeding with native meadow species. Revegetate California black oak and floodplain understory with appropriate plants. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used. Revegetate with willows, cottonwoods and other riparian species. Crews would work 12 weeks during the fall for two years.

**El Capitan Meadow: bisected by road, informal trails, conifer encroachment (RES-2-009)** – Remove all informal trails and areas of bare compacted soils and restore to native plant communities. Disperse and reduce roadside parking along the meadow through alternative pavement striping (approximately 30 spaces removed). Retain some roadside parking for SAR and other administrative

traffic. Use restoration fencing and signing where necessary to further protect the meadow from trampling. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately three months.

**Stoneman Meadow and Orchard parking lot: Road through meadow and parking lot (RES-2-008)** – Remove the road through Stoneman Meadow to restore 1.9 acres of wet meadow and improve hydrology to entire meadow. Remove 7,260 cubic yards of asphalt and imported fill material, recontour to natural topography and restore natural hydrology. Revegetate through propagation and seeding with native meadow species. Remove apple trees. Remove imported fill, decompact soils and recontour using the 1919 maps as a guide. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Revegetate with willows, cottonwoods and other riparian species. Crews would work 12 weeks during the fall for two years.

**Housekeeping Camp: riparian restoration and river access (RES-2-023)** – Remove all infrastructure and riprap at Housekeeping Camp and restore 16.8 acres of floodplain and riparian ecosystem to natural conditions. Convert area to day use river access (raft put-in) and picnicking. Focus river access to resilient locations. This work would be phased over the course of two seasons and would occur between midsummer and early winter, depending on weather and soil moisture. All work within the bed and banks of the river would be done at low river flow conditions. Phase 1 (year 1) would take 14 weeks and would concentrate on the removal of all infrastructure including lateral utilities, concrete structures, revetment and, when hauling is complete, removal of imported fill material. Native sand and gravel fill may be retained on site. Phase 2 (year 2), would include additional grading and contouring, decompaction of soils, fence construction and planting and would take six weeks. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.

**Upper and Lower Rivers Campground: abandoned infrastructure (RES-2-021)** – Restore topography of 35.6 acres of impacted floodplain to support a mosaic of riparian, meadow and California black oak woodland at the former Rivers campgrounds site. Remove any remaining asphalt, decompact soils of former roads and campsites and re-establish seasonal channels and natural topography that have been graded flat. Develop a planting plan for restoring native plant communities and restoring soils to support them. Mechanically remove ponderosa pine and incense cedar saplings and mature trees that are infringing on California black oaks and growing on soils that once supported meadow communities. Revegetate with native meadow grasses, sedges, and shrubs. Plant native riparian species, such as willow, alder and cottonwood along riverbanks. Remove Lower River amphitheater structure and associated fill material. Restore natural topography to original contours and revegetate with wetland plants. Fence the revegetated areas for up to 3 years to prevent trampling of young plants and seedlings. This work would be phased over two years. Excavation of former channels and roads would generate asphalt, rock and other material not suited to the ecology of the site and would be moved off-site. The excavation, grading and hauling would last ten to twelve weeks. Fencing and planting would be done in an additional three weeks. Heavy equipment including excavator, skid steer, loader, dozer, and dump truck would be used. Most if not all of this work would be completed in the late summer and fall.

**Valley Campgrounds: campsites near the river (RES-2-022)** – Remove all campsites and infrastructure at all sites within the 100-year floodplain and restore 25.1 acres of floodplain and

riparian habitat. This includes all sites at North Pines and Yellow Pines campgrounds, 19 sites at Backpacker's Campground, 32 sites at Lower Pines and 22 sites at Upper Pines. Remove asphalt, base rock, fill material; decompact soils, recontour and revegetate. Erect new fencing or adjust existing fencing to protect the riparian zone. Restore topography with natural drainages. Restore a mosaic of riparian, meadow, and oak habitat. Revegetate with native species. Repair eroded riverbanks with brush layering and willow planting. Remove conifer saplings. Twenty-two weeks crew and equipment time would be needed for implementation over a three year period. Work within the bed and banks of the river would occur at low river flow while work on the terrace would occur in the summer or fall. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used.

**Revetment: free flowing condition (RES-2-051)** – In addition to the revetment removed in the Common to All Action Alternative, remove 964 linear feet of riprap adjacent to Sugar Pine, Ahwahnee and Stoneman Bridges. Excavator, skid steer, loader, and dump truck would be used. Revegetate with willows, cottonwoods and other riparian species. Crews would work 12 weeks over two years during low flow in fall.

**Stoneman Bridge: free flowing condition (RES-2-053)** – Remove Stoneman Bridge, asphalt, and other imported material. Salvage native river gravel from the berm and place in cut-off channel. Salvage other native soils for use in restoration. Revegetate with riparian species. Implementation would take 10 weeks with all work except asphalt removal occurring at river low flow conditions. Excavator, skid steer, dozer, and dump truck would be used.

**Sugar Pine Bridge and Ahwahnee Bridge and Road Berm: free flowing condition (RES-2-052)** – Remove Sugar Pine and Ahwahnee Bridges and the causeway between Sugar Pine and Ahwahnee Bridges and associated berm. Remove asphalt and other imported material. Salvage native river gravel from the berm and place in cut-off channel. Salvage other native soils for use in restoration. After bridge removal, allow channel to reconfigure on its own. Revegetate with riparian species. Implementation would take 15 weeks with all work except asphalt removal occurring at river low flow conditions. Reroute the multiple use trail to the north bank of the river. Excavator, skid steer, loader, and dump truck would be used.

**Concessioner stables to Happy Isles: pack stock trail (RES-2-143)** – Remove trail and restore to natural conditions (see actions common to all).

**Camp 6: Water Quality, proximity to the River, and fill material within the 5-to 10-year floodplain. (RES-2146)** – Restore 10.8 acres of riparian and floodplain habitats at Camp 6 up to the 10-year floodplain: remove unnatural fill identified in soil studies. Remove construction-generated boulders remaining from use as staging area. Plant riparian and wetland species appropriate to the habitat after fill removal. Allow seasonal flooding to re-work remaining topography. Revegetate eroded riverbanks and increase signage to avoid continued impacts (Figure 9). Heavy equipment including excavator, skid steer, dozer, loader, and dump truck would be used.



**Figure 9:** Healthy herbaceous riparian vegetation growing on the riverbank (left) contrasts with trampled and eroded riverbank adjacent the Camp 6 Day Use Parking Lot.

**Valley Meadows: Valley Loop Trail impacts through meadows (RES-2-005)** – Reroute trail through Slaughterhouse Meadow out of wetlands to an upland area. Move the 780 feet of the trail through Bridalveil Meadow to the toe of the fill slope of Southside Drive. Decompact, recontour and revegetate the abandoned sections of trail with native meadow species. Because trail reroute would be located in the upland, work may occur at any time of year and would take three weeks crew time. Removal of existing trail and replanting of meadow would take three weeks in the fall. Heavy equipment including excavator, skid steer, loader, dozer, and dump truck would be used.

**Ahwahnee Meadow oxbows: trail impacts (RES-2-003)** – Reroute the trail so it does not pass through wetlands; consolidate use with trail to Housekeeping Footbridge where possible. Remove asphalt and fill material from abandoned section of trail and revegetate with native wetland plants. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Former Yosemite Lodge cabins (Pine and Oak) area (RES-2-154)** – Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (area commonly known as the Oak and Pine cabins, which were removed after being damaged by the 1997 flood). Remove riprap from Yosemite Creek and plant willows along stream bank. Remove informal trails throughout the eastern end of the lodge near Yosemite Creek and formalize one trail through the area. Delineate one service road to the well house and parking. Remove excess service roads. Remove fill, decompact soils and plant riparian plant species. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used.

#### ***Segment 4***

**Old El Portal: parking and development in valley oaks (RES-4-002)** – Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D). Also, create a valley oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompact

soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur in the late summer or fall and take approximately one month.

### *Segment 7*

**Wawona golf course (RES-7-004)** – Remove the golf course and restore meadow ecosystem. Recontour to natural topography. Remove any imported fill material. Remove non-native plants and restore native meadow plant communities through propagation, seeding, and planting. Remove channelization of creek and restore natural hydrology. Continue to use the area as a spray field. This would occur with large heavy equipment over a three year period working three months per year. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.

**Wawona Campground: campground activity near river (ONA-7-001)** – Remove 32 campsites in Wawona Campground that are in the 100-year floodplain or in culturally sensitive areas to restore 8.2 acres of riparian and floodplain ecosystem. Decompact soils and plant with riparian vegetation. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month. Wawona Stock Camp (RES-7-011): Two stock use campground sites relocated from sensitive resource area to Wawona Stables. The sites will then be recontoured, soil decompacted and revegetated. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

## **Alternative 3**

This alternative provides for significant restoration within 150 feet of the river. This alternative targets restoration strategically throughout the corridor, removing infrastructure such as campsites, roads, bridges, informal and formal trails from sensitive areas. It restores targeted areas such as the 10 year floodplain near Camp 6, the former Upper and Lower Rivers Campgrounds, the 100 year floodplain at Housekeeping Camp, and the Wawona Golf Course. In total, it restores 302 acres to natural conditions within the river corridor.

### *Segment 1*

**Merced Lake Ranger Station Meadow: grazing (RES-1-002)** – Develop preliminary grazing capacities for the Merced Lake East Meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed.

### *Segment 2*

**Yosemite Lodge: buildings in the 100-year floodplain (RES-2-024)** – Remove 4 buildings in the 100-year floodplain and restore floodplain and riparian habitat. Heavy equipment including excavator,



skid steer, loader, and dump truck would be used. Work would occur during the summer or fall and take approximately one month.

**Ahwahnee Meadow: Northside Drive and bike path impact hydrology and meadow extent (RES-2-004)** – Same as Alternative 2.

**El Capitan Meadow: bisected by road, informal trails, conifer encroachment (RES-2-009)** – Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing and signing to designate appropriate meadow access points. Revegetate with native meadow species. Boardwalks would not be used as an action within this alternative. Remove ditches and restore natural hydrology. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during the summer or fall and take approximately one month.

**Stoneman Meadow and Orchard parking lot: Road through meadow and parking lot (RES-2-008)** – Remove the road through Stoneman Meadow as in Alternative 2. Remove some asphalt from the Curry Orchard parking and revegetate with native plants. Remove apple trees to mitigate human-bear encounters. Remove imported fill, decompact soils and recontour where road and parking is removed. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during the summer or fall and take approximately two months.

**Housekeeping Camp: riparian restoration and river access (RES-2-023)** – Remove all lodging infrastructure and riprap at Housekeeping Camp and restore 16.8 acres of floodplain and riparian ecosystem to natural conditions. Convert area to day use river access (raft put-in) and picnicking, while focusing river access to the sandbar across from Housekeeping Bridge. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately two months.

**Upper and Lower Rivers Campground: abandoned infrastructure (RES-2-021)** – Same as Alternative 2.

**Valley Campgrounds: campsites near the river (RES-2-022)** – Remove sites at Backpacker's Camp, Lower Pines and North Pines Campgrounds that are within 150' of the ordinary high water to restore 12 acres of riparian habitat (Figure 9). Remove asphalt, base rock, fill material; decompact soils, recontour and revegetate. Erect new fencing or adjust existing fencing to protect the riparian zone. Harden river access point at North Pines campground by using pinned logs back filled with native gravel. Fence sensitive areas and brush layer with willows to repair eroded riverbank and revegetate denuded areas. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Revetment: free flowing condition (RES-2-051)** – In addition to actions common to all, an additional 435 linear feet of riprap would be removed and the river banks revegetated. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the fall and take approximately four months.

**Stoneman Bridge: free flowing condition (RES-2-053)** – Same as Alternative 2.

**Sugar Pine Bridge and Ahwahnee Bridge and Road Berm: free flowing condition (RES-2-052) –**  
Same as Alternative 2.

**River reach between Clark’s and Sentinel Bridges: highly impacted riverbanks (RES-2-062) –**  
Same as Alternative 2.

**Concessioner stables to Happy Isles: pack stock trail (RES-2-143) –** In addition to the actions described in common to all, re-route stock trail north along the road where it meets up with the Valley Loop Trail. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during the summer or fall and take approximately one month.

**Camp 6: Water Quality, proximity to the River, and fill material within the 5-to 10-year floodplain (RES-2-146) –** Same as Alternative 2.

**Valley Meadows: Valley Loop Trail impacts through meadows (RES-2-005) –** Same as Alternative 2.

**Ahwahnee Meadow oxbows: trail impacts (RES-2-003) –** Same as Alternative 2.

**Former Yosemite Lodge cabins (Pine and Oak) area (RES-2-154) –** Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (area commonly known as the Oak and Pine cabins, which were removed after being damaged by the 1997 flood). Remove riprap from Yosemite Creek and plant willows along stream bank. Remove informal trails throughout the eastern end of the lodge near Yosemite Creek and formalize one trail through the area. Delineate one service road to the well house and parking. Remove excess service roads. Remove fill, decompact soils and plant riparian plant species. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used.

#### ***Segment 4***

**Old El Portal: parking and development in valley oaks (RES-4-002) –** Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D). Also, create a valley oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur in the late summer or fall and take approximately one month.

#### ***Segment 7***

**Site-Specific Programmatic Wawona golf course: operating in old meadow habitat (RES-7-004) –**  
Same as Alternative 2.

**Wawona Campground: campground activity near river (ONA-7-001) –** Retains 69 sites and one group site. Remove 27 sites that are either within 150 feet of the river or in culturally sensitive areas.

Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Wawona Stock Camp (RES-7-011)** – Two stock use campground sites relocated from sensitive resource area to Wawona Stables. The sites will then be recontoured, soil decompacted and revegetated. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

## **Alternative 4**

In this alternative, restoration efforts are targeted at the riparian buffer and select road and bridge removal, with a total of 223 acres restored. Removal of campsites and riparian restoration within 150 feet of the bed and banks would occur. Two bridges—Ahwahnee and Sugar Pine—would be removed and the road through Stoneman meadow would be rerouted out of the meadow and the meadow extent restored. Campsites, informal trails and non-essential roads would be removed from culturally sensitive areas.

### ***Segment 1***

**Merced Lake Ranger Station Meadow: grazing (RES-1-002)** – Remove the Merced Lake East Meadow from grazing permanently. Require all administrative pack stock passing through the Merced Lake area to carry pellet feed.

### ***Segment 2***

**Ahwahnee Meadow: Northside Drive and bike path impact hydrology and meadow extent (RES-2-004)** –Mitigate effects of the road and bike trail through the meadow with culverts or other engineered solutions that allow passage of underground water. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.

**El Capitan Meadow: bisected by road, informal trails, conifer encroachment (RES-2-009)** – Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing along northern perimeter of meadow and designate appropriate access points using boardwalks and viewing platforms. Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks for two years. Work would take place during summer or fall. Fencing can occur any time of the year.

**Stoneman Meadow and Orchard parking lot: Road through meadow and parking lot (RES-2-008)** – Remove the road through Stoneman Meadow as in Alternatives 2 and 3. Remove part of Curry Orchard parking lot to restore 3.4 acres of meadow. Remove imported fill, decompact soils and recontour using the 1919 maps as a guide. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during the summer or fall and take approximately three months.

**Housekeeping Camp: riparian restoration and river access (RES-2-023)** – Remove 166 units to restore 12.2 acres of riparian zone. Provide for day use arriving via shuttle with trails to access to the large sandbars on the western edge of Housekeeping Camp and across Housekeeping Bridge. Restore natural topography and channels through the removal of fill material. Revegetate with native riparian and wetland species. Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks for two years. Work would take place during low water in the fall.

**Upper and Lower Rivers Campground: abandoned infrastructure (RES-2-021)** – Restore and protect 19.7 acres of the riparian zone at the former Rivers campgrounds site to a mosaic of riparian, meadow, and California black oak habitat. Fence and close the riparian zone at Upper Rivers to protect the riverbank from trampling. Mechanically remove ponderosa pine and incense cedar saplings and mature trees less than 18 inch dbh (diameter at breast height) within the restoration area that are infringing on California black oaks and growing on soils that once supported meadow communities. Revegetate with native meadow grasses, sedges, and shrubs. Plant native riparian species such as willow, alder, and cottonwood along the riverbank. Direct river access to the sandbar at Lower Rivers or to the beach across the Ahwahnee Bridge. Use signage for way finding and for interpretation of river-related natural processes. Remove any remaining abandoned asphalt, decompact soils of former roads and campsites. Restore natural contours and re-establish drainage channels that have been filled. Place large box culverts or other design components such as rolling dips, permeable sub grade, etc to improve surface water flow across roads and trails. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used over a period of up to two months for two years in the fall.

**Valley Campgrounds:** Remove campsites near the river (RES-2-022) – Same as Alternative 3.

**Revetment:** free flowing condition (RES-2-051) – Same as Alternative 3.

**Stoneman Bridge: free flowing condition (RES-2-053)** – Mitigate effects of bridge through engineered solutions. Place large wood to lessen the scouring from bridge. Use brush layering and place a constructed log jam. Add culverts along Northside Drive to improve drainage. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Sugar Pine Bridge and Ahwahnee Bridge and Road Berm: free flowing condition (RES-2-052)** – Remove Sugar Pine and Ahwahnee Bridges as in Alternative 2. Heavy equipment including excavator, skid steer, loader, and dump truck would be used and work would last for up to four weeks.

**Concessioner stables to Happy Isles: pack stock trail (RES-2-143)** – Same as Alternative 2.

**Camp 6: Water Quality, proximity to the River, and fill material within the 5-to 10-year floodplain (RES-2-146)** – Restore 6.1 acres in the 150 foot riparian buffer adjacent to Camp 6: remove unnatural fill as identified in soil studies. Plant native riparian species in unvegetated areas after fill removal. Allow seasonal flooding to re-work remaining topography. Revegetate eroded riverbanks, fence the riparian buffer and increase signage to avoid continued impacts (Figure 7). Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks for two years and take place during low water in the fall.

**Valley Meadows: Valley Loop Trail impacts through meadows (RES-2-005)** – Same as Alternative 2.

**Ahwahnee Meadow oxbows: trail impacts (RES-2-003)** – In the sections of trail (350 feet) that pass through oxbows, remove the asphalt and fill and replace with a boardwalk. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Former Yosemite Lodge cabins (Pine and Oak) area (RES-2-154)** – Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (area commonly known as the Oak and Pine cabins, which were removed after being damaged by the 1997 flood). Remove riprap from Yosemite Creek and plant willows along stream bank. Remove informal trails throughout the eastern end of the lodge near Yosemite Creek and formalize one trail through the area. Delineate one service road to the well house and parking. Remove excess service roads. Remove fill, decompact soils and plant riparian plant species. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used.

#### ***Segment 4***

**Old El Portal: parking and development in valley oaks (RES-4-002)** – Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D). Also, create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur in the late summer or fall and take approximately one month.

#### ***Segment 7***

**Wawona Campground: campground activity near river (ONA-7-001)** – Same as Alternative 3.

**Wawona Stock Camp (RES-7-011)** – Two stock use campground sites relocated from sensitive resource area to Wawona Stables. The sites will then be recontoured, soil decompact and revegetated. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during the summer or fall and take approximately one month.

### **Alternative 5**

This alternative would restore riparian habitat along the Merced River 100 feet from the ordinary high water mark. To enhance free-flowing condition it would remove Sugar Pine Bridge and increase channel complexity below the other bridges through addition of constructed log jams and other bioengineering techniques. It restores 203 acres to natural conditions within the river corridor and includes removing campsites within 100 feet of the bed and banks and removing informal trails and

non-essential roads from sensitive areas. This alternative calls for the study of road removal through Stoneman Meadow.

### *Segment 1*

**Merced Lake Ranger Station Meadow: grazing (RES-1-002)** – Same as Alternative 3.

### *Segment 2*

**Ahwahnee Meadow: Northside Drive and bike path impact hydrology and meadow extent (RES-2-004)** – Same as Alternative 4.

**El Capitan Meadow: bisected by road, informal trails, conifer encroachment (RES-2-009)** – Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing along northern perimeter of meadow and designate appropriate access points using boardwalks and viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside. Equipment including skid steer would be used over a period of up to six weeks for two years. Fencing can occur any time of the year.

**Stoneman Meadow and Orchard parking lot: Road through meadow and parking lot (RES-2-008)** – Study potential for road removal through Stoneman Meadow. Remove roadside parking along Stoneman Meadows and restore to meadow conditions. Remove 1,350 cubic feet of fill, revegetate with native seed and/or transplanted native plants. Remove apple trees in Curry Orchard parking lot. For roadside parking removal, equipment work, hauling, and revegetation would take 10 weeks with work performed in the late summer or fall. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.

**Housekeeping Camp: riparian restoration and river access (RES-2-023)** – Remove 34 units from within the ordinary high water mark to restore 1 acre of riparian habitat (Figure 10). After removal of structures, adjust fence location to provide greater distance away from the bed and banks. Revegetate with riparian plant species. The work would be performed in the fall after the camp is closed for the season. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck may be used over a period of up to eight weeks.

**Upper and Lower Rivers Campground: abandoned infrastructure (RES-2-021)** – Same as Alternative 4.



**Figure 10:** Radiating effects from campsites lead to denuded riparian zones, as seen at this campsite at North Pines Campground. In all alternatives, campsites would be moved back at least 100' from the bed and banks of the river to provide a buffer in which a diversity of riparian vegetation can thrive.

**Valley Campgrounds: campsites near the river (RES-2-022)** -Remove sites at Backpacker's Camp, Lower Pines and North Pines Campgrounds that are within 100 feet of the ordinary high water to restore 6.5 acres of riparian habitat. Remove asphalt, base rock, fill material; decompact soils, recontour and revegetate. Erect new fencing or adjust existing fencing to protect the riparian zone. Harden river access point at North Pines campground. Construct a hardened surface using pinned logs back filled with native gravel. Fence sensitive areas and brush layer to repair eroded riverbank (Figure 10). Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks for two years.

**Revetment: free flowing condition (RES-2-051)** – Same as Alternative 3.

**Stoneman Bridge: free flowing condition (RES-2-053)** – Same as Alternative 4.

**Sugar Pine Bridge and Ahwahnee Bridge and Road Berm: free flowing condition (RES-2-052)** – Remove the Sugar Pine Bridge and berm. At the Ahwahnee Bridge, heading south toward the Lower Pines campground, connect a trail and small bridge going over the cut-off channel. Additionally, re-route the multiple use trail to the north bank of the river. Manually cut pieces of the bridge into smaller sections. Remove bridges with heavy equipment (crane lifts sections or chunks). Pontoon rafts below the bridge would catch debris. All work from the banks would use the reach from an excavator to remove chunks of bridge. Footings would be removed with excavators from the bank. The removal would occur during low flow in late summer or early fall. No work would occur after Oct. 31 due to the potential for high water events occurring. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately three months.

**Concessioner stables to Happy Isles: pack stock trail (RES-2-143)** – Same as Alternative 3.

**Camp 6: Water Quality, proximity to the River, and fill material within the 5-to 10-year floodplain (RES-2146)** – Same as Alternative 4.

**Valley Meadows: Valley Loop Trail impacts through meadows (RES-2-005)** – Construct boardwalks through sensitive wet meadow habitat in Slaughterhouse Meadow. Move 780 feet of the trail that runs through Bridalveil Meadow to the toe of the fill slope of Southside Drive. Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks for two years.

**Ahwahnee Meadow oxbows: trail impacts (RES-2-003)** – Same as Alternative 4.

**Former Yosemite Lodge cabins (Pine and Oak) area (RES-2-154)** – Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (area commonly known as the Oak and Pine cabins, which were removed after being damaged by the 1997 flood). Remove riprap from Yosemite Creek and plant willows along stream bank. Remove informal trails throughout the eastern end of the lodge near Yosemite Creek and formalize one trail through the area. Delineate one service road to the well house and parking. Remove excess service roads. Remove fill, decompact soils and plant riparian plant species. Heavy equipment including excavator, dozer, skid steer, loader, and dump truck would be used.

*Segment 4*

**Old El Portal: parking and development in valley oaks (RES-4-002)** – Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D). Also, create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur in the late summer or fall and take approximately one month.

*Segment 7*

**Wawona Campground: campground activity near river (ONA-7-001)** – Retains 83 sites and one group site. Remove 13 sites that are either within 100 feet of the river or in culturally sensitive areas.

**Wawona Stock Camp (RES-7-011)** – Two stock use campground sites relocated from sensitive resource area to another more appropriate location near the Wawona Maintenance Yard. The sites will then be re-contoured, soil decompacted and area re-vegetated. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

**Alternative 6**

As with Alternative 5, this alternative is characterized by having limited restoration within 100 feet of the river; removing campsites, informal trails, and non-essential roads from sensitive areas. It addresses free-flowing condition by removing approximately one mile of revetment and increasing channel complexity around the bridges through engineered solutions. The number of acres of riparian and meadow restoration is at least 170 acres, targeting the most sensitive areas.

*Segment 1*

**Merced Lake Ranger Station Meadow: grazing (RES-1-002)** – Same as Alternative 3.

*Segment 2*

**Ahwahnee Meadow: Northside Drive and bike path impact hydrology and meadow extent (RES-2-004)** – Same as Alternative 4.

**El Capitan Meadow: bisected by road, informal trails, conifer encroachment (RES-2-009)** – Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing along northern perimeter of meadow and designate appropriate access points using boardwalks and



viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside. Equipment including skid steer would be used over a period of up to six weeks for two years. Fencing can occur any time of the year.

**Stoneman Meadow and Orchard parking lot: Road through meadow and parking lot (RES-2-008)** – Mitigate effects of the road through the meadow with culverts or other engineered solutions that allow passage of underground water. Remove roadside parking along Stoneman Meadow and restore the area to meadow conditions. Remove 1,350 cubic feet of fill, revegetate with native seed and/or transplanted native plants. Remove apple trees in Curry Orchard parking lot. Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks for two years in late summer and fall.

**Housekeeping Camp: riparian restoration and river access (RES-2-023)** – Same as Alternative 5.

**Upper and Lower Rivers Campground: abandoned infrastructure (RES-2-021)** – Same as Alternative 4.

**Valley Campgrounds: campsites near the river (RES-2-022)** – Same as Alternative 5.

**Revetment: free flowing condition (RES-2-051)** – An additional 348 feet of riprap south of the berm between Sugar Pine and Ahwahnee bridges would be removed and replaced with brush layering. Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks in the fall during low flow.

**Stoneman Bridge: free flowing condition (RES-2-053)** – Same as Alternative 4.

**Sugar Pine Bridge and Ahwahnee Bridge and Road Berm: free flowing condition (RES-2-052)** – Improve riverbank condition at Sugar Pine and Ahwahnee Bridges by increasing channel complexity through construction of engineered log jams, strategic placement of large wood, removal of rip rap, and bioengineering of the riverbank. Reduce the width of the cut-off channel upstream of Sugar Pine bridge through a combination of fill, constructed log jams, and bioengineered bank stabilization. If subsequent monitoring of riparian condition reveals insufficient improvement (i.e. CRAM rating remains below 0.71) within 10 years of the implementation of these actions, more aggressive management action may be initiated, including the possible removal of Sugar Pine Bridge. Heavy equipment including excavator, skid steer, loader, and dump truck would be used over a period of up to eight weeks for two years during the fall low flow.

**Concessioner stables to Happy Isles: pack stock trail (RES-2-143)** – Same as Alternative 3.

**Camp 6: Water Quality, proximity to the River, and fill material within the 5-to 10-year floodplain (RES-2146)** – Same as Alternative 4.

**Valley Meadows: Valley Loop Trail impacts through meadows (RES-2-005)** – Same as Alternative 5.

**Ahwahnee Meadow oxbows: trail impacts (RES-2-003)** – Same as Alternative 4.

### *Segment 4*

**Old El Portal: parking and development in valley oaks (RES-4-002)** – Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D). Also, create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompact soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur in the late summer or fall and take approximately one month.

### *Segment 7*

**Wawona Campground: campground activity near river (ONA-7-001)** – Same as Alternative 5.

**Wawona Stock Camp (RES-7-011)** – Two stock use campground sites relocated from sensitive resource area to Wawona Stables. Heavy equipment including excavator, skid steer, loader, and dump truck would be used. Work would occur during low flow in the summer or fall and take approximately one month.

## **BEST MANAGEMENT PRACTICES: TOOLS AND TECHNIQUES**

### **Mitigations**

All ecological restoration work would follow the Mitigation Measures outlined in Appendix C.

### **Restoration work in Wilderness**

For restoration needs in designated Wilderness, a minimum requirement analysis would be completed and the appropriate techniques selected.

### **Fencing**

Fencing has proven to be effective at rerouting pedestrian traffic to appropriate river access points and allowing colonization of denuded areas with riparian plant species which then stabilizes the river bank from further erosion (Figure 11). Yosemite has used different fencing



**Figure 11:** Frequently flooded area at housekeeping camp.

styles—most often split rail zigzag and post and rail (Figure 12). Log and block fencing has also been introduced as a more sustainable option in areas where plowing and vehicles frequently cause damage to fencing (Figure 13). Fencing has also demonstrated its effectiveness in supporting restoration efforts in meadow environments. Fencing has been used to delineate appropriate trails and to close off sensitive sections of meadows in order to deter trampling of vegetation and the formation of informal trails.



**Figure 12:** Before and after protective fencing placement and revegetation at Housekeeping camp.



**Figure13:** Post and rail fencing (Left) and log and block fencing (right).

## **Asphalt Removal**

Asphalt surface is broken using heavy equipment. Asphalt is then loaded into dump trucks using a loader and moved off site. Small asphalt pieces may be manually collected and removed.

## **Fill Removal & Recontouring**

The topography at some meadow, wetland, and floodplain sites has been made uniform through the import of fill material or by grading or flattening contours of the landform. To re-establish contours or increase topographic heterogeneity, an excavator or dozer may be used to excavate depressions, cut-off channels, and oxbows. On steep riverbanks, an excavator or dozer may push soils and material down the

slope of the bank to create a gentler slope which increases revegetation success. Whenever possible, native fill is used from the restoration site. In meadows with drainage ditches and associated berms, the ditches would be contoured and leveled using fill material already present in associated berms.

## **Soil Decompaction**

Roads, parking, campsites and trails (formal or informal) may have highly compacted soils that are hydrophobic and prevent water from percolating into the soil and alter surface flow patterns. In the field, park staff determines areas of heavy soil compaction and either break up the soils manually using shovels or rakes or with heavy equipment that can support ripping tines such as excavators, skid steer and dozers. Small pockets of fill may be blended into the soil as decompaction occurs with an excavator or dozer with winged rippers. Biologists regularly monitor informal trailing extent and distribution in meadows and apply condition ratings to all informal trails. These ratings reflect the degree to which specific trails have ecological impacts including: bare ground, vegetation condition, and soil compaction. This information would assist restoration workers in identifying areas requiring soil decompaction to promote plant recovery.

## **Riprap Removal**

Several park restoration projects have involved the removal of riprap and restoration of healthy riparian vegetation (Figure 13). Riprap is removed using a track-mounted excavator. The operator picks up the boulders with the bucket of the excavator and either stockpiles the rocks on the terrace, or loads directly into a dump truck. After riprap is removed the bank may be recontoured to facilitate plant establishment.

## **Bioengineering Techniques**

Bioengineering techniques commonly used for riverbank stabilization and restoration include willow hydrodrilling, brush layering, and wood incorporation (Figure 14). Willow wattles and anchoring logs may be used to accrete sediment. To propagate willow, cuttings are taken from established plants and placed deeply into the soil to promote regeneration and to prevent them from washing away during high water events. Rocky or compacted riverbanks are most effectively and efficiently planted using a hydraulic excavator. In fine sediment, a hydro-drill (a pump with a high-powered stream of water) can create deep holes into which cuttings are placed. Willows may also be bundled into wattles and partially buried and anchored along riverbanks. Large wood may also be used to provide structure when repairing highly eroded riverbanks or after riprap removal. One objective of bioengineering is to decrease flow velocities by increasing roughness so that river sediment is captured over time, slowly rebuilding the banks.





**Figure 14:** Before (left) and after (right) riverbank restoration through riprap removal and revegetation at the former Lower Rivers Campground. Riparian vegetation thrives on the riverbank.

## Revegetation Methods

In the riparian zone, sedges, rushes and willow and cottonwood are desirable species for planting. Restoration staff collect pole cuttings (for vertical planting using the hydrodrill, Figure 15) from willows and cottonwoods along the Merced River using loppers; targeting straight branches 5-6' long and approximately 1" in diameter. Horizontal planting (such as that done with an excavator or backhoe) is another revegetation method, as well as the primary planting method for bioengineering. This method is utilized at sites with greater disturbance where riverbank integrity and existing root mass does not exist. Overall, willows have a high survival rate although some species do not establish as readily as others.



**Figure 15:** Yosemite restoration staff have employed bioengineering techniques in past park projects including Brush layering with willows (left). Restoration workers insert live willow cuttings with the aid of a hydrodrill to revegetate this riverbank (right).

On riverbank terraces, species matching the surrounding native flora would be planted. Watering or irrigation is part of post-planting maintenance for 3 years as it increases plant survival, especially on higher and drier sites such as terraces. Vegetation along the riverbanks plays an important role in flow attenuation and sediment capture during flood events. Native riparian vegetation is also naturally recruited on exposed sediment. Nursery-grown plants would be propagated from local genetic stock. Plants would be salvaged prior to ground disturbance and replanted.

In meadow environments, park biologists use a variety of techniques for ecological restoration. Imported fill material is removed from meadows using heavy equipment such as an excavator, loader, and dump truck. When removing informal trails, restoration workers would decompact soils, recontour the area to remove the linear feature and spread locally gathered native seed to promote plant establishment. Sometimes, vegetation plugs are salvaged using an excavator and skid steer and replanted in the disturbed areas. Mulching to promote revegetation and reduce erosion would be used as necessary. Bare areas would be revegetated with native plants grown from locally collected seed. Erosion control blankets and wattles are sometimes needed to control erosion until vegetation becomes established.

## **Large Wood Incorporation**

To restore riverbanks that have receded due to unnatural bank erosion, large wood may be incorporated into riverbanks. Large logs are placed strategically to limit scour and promote accretion and may or may not be anchored. For example, logs may be placed into a trench dug in the terrace to anchor it. Cabling could also be used to anchor wood to the shore.

These techniques are similar to what has been used in Yosemite Valley riverbank restoration projects in the past. For example, incorporation of large wood was successfully used in the 1995 Housekeeping Camp Restoration, along with riprap removal, brush layering and fencing.

## **Opportunistic Large Woody Debris Addition through Hazard Tree Mitigation**

Potentially hazardous trees are sometimes felled along the river for safety reasons. To assist in the riverine habitat recovery, these hazard trees can be purposefully felled into the river. Trees are felled using both excavators and forestry loaders with winch. This retention of the root wad provides needed weight to help anchor the tree to the shore. Felled trees add biomass, slow water flow, create structural and microclimatic diversity, and provide shade for riparian organisms.

## **Constructed Log Jams**

Constructed log jams (CLJs) increase channel complexity, capture sediment, mitigate channel widening and provide aquatic habitat. CLJs are constructed of 10-20 logs, often with their root wads intact, 12" or greater in diameter. The composite structure can be 30-150' long and 10-30' wide with a height of 8 feet. Thus, an CLJ may occupy an area of 33 500 square yards with volumes ranging from 90 – 1,300 cubic yards. The particular size of a given CLJ depends on the objective (deflecting flow away from a vulnerable riverbank to facilitating bar formation) and its location in the river. CLJs are

constructed in the river channel and anchored by burying ends of logs in sediment. CLJs would be designed to look natural, without straight-cut edges and with root wads remaining. Planting of riparian vegetation on the CLJ further enhances the natural aesthetic (Figure 16).



**Figure 16:** Natural wood loading in the Merced River (left) and an engineered log jam (right, photo courtesy of A.P. Brooks).

## Boardwalks

Boardwalks have proven to be a low-impact way of providing access to wet, sensitive and highly visited areas that are susceptible to trampling (Figure 17). Boardwalks are often used in restoration as alternative to complete closures of sensitive habitats. Boardwalks are an effective way to promote sheet flow, protect native vegetation, and reduce the potential vectors for the spread of non-native species, while allowing visitors to experience the flora and fauna of these unique environments. In Yosemite, boardwalks have been successful in allowing visitation of sensitive meadows and can provide access and throughways in locations where current trails are frequently inundated with water, cause severe damage to plants and soils, and fragment sensitive vegetation and wildlife communities.



**Figure 17:** Trails through frequently inundated wet meadows, such as in cook's meadow pre-restoration (left), cause periperal vegetation trampling and soil compaction and make access difficult. A boardwalk installed in 2005 allows for visitor access into the meadow environment and protects the meadow soils and hydrology.

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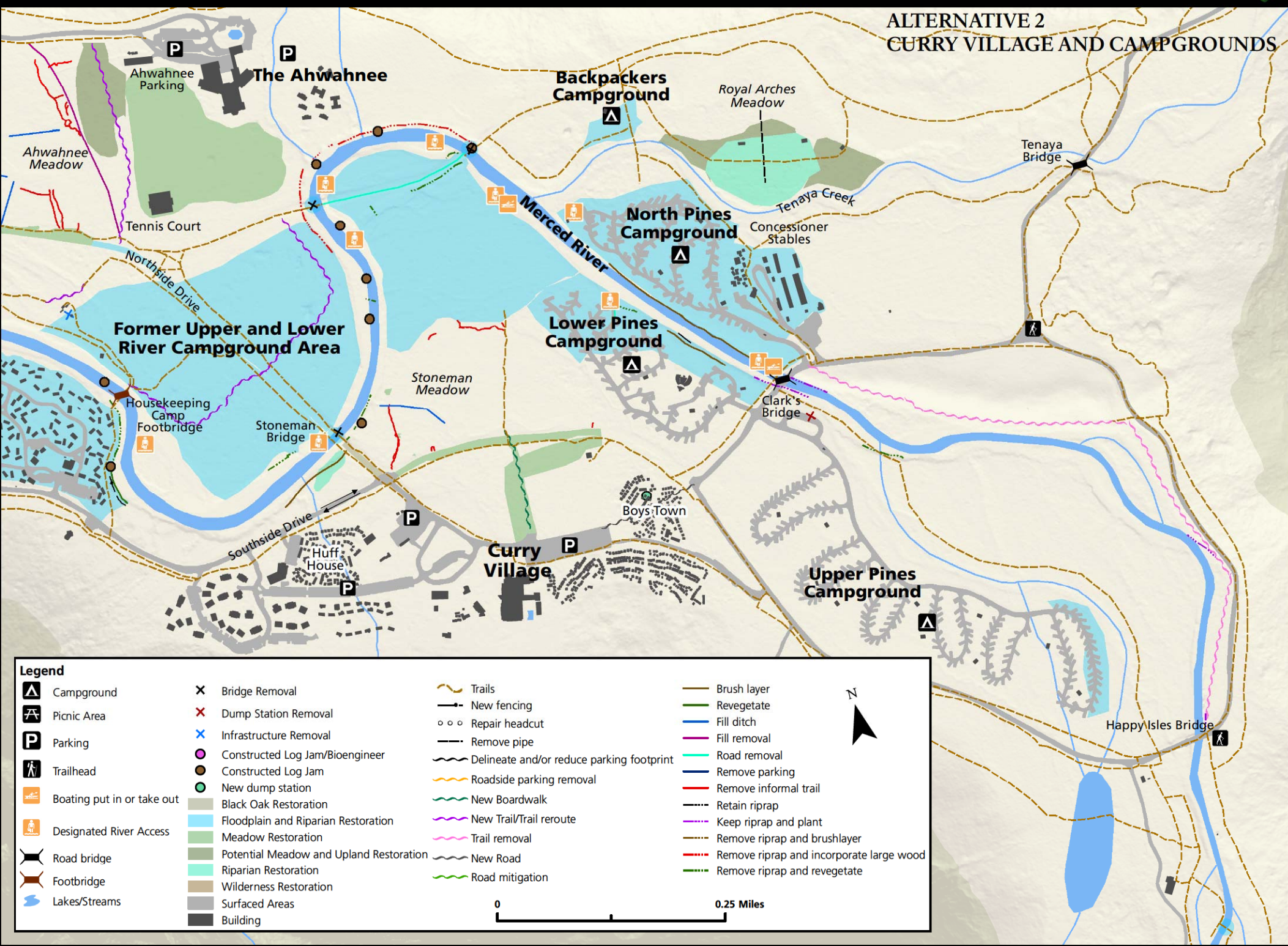
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### ALTERNATIVE 2 CURRY VILLAGE AND CAMPGROUNDS



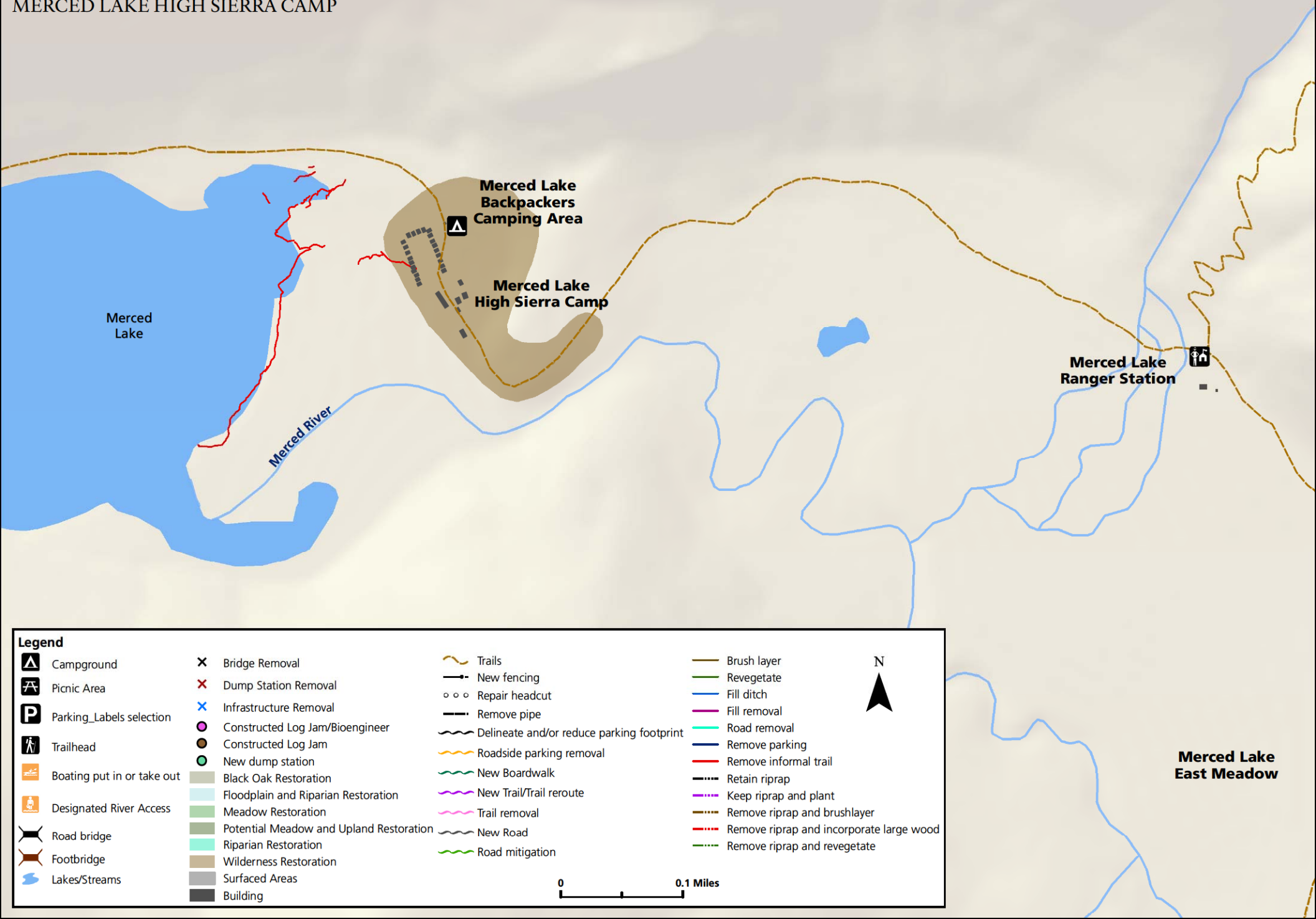
#### Legend

- |                            |   |   |  |
|----------------------------|---|---|--|
| Campground                 | Bridge Removal                          | Trails                                    | Brush layer                              |
| Picnic Area                | Dump Station Removal                    | New fencing                               | Revegetate                               |
| Parking                    | Infrastructure Removal                  | Repair headcut                            | Fill ditch                               |
| Trailhead                  | Constructed Log Jam/Bioengineer         | Remove pipe                               | Fill removal                             |
| Boating put in or take out | Constructed Log Jam                     | Delineate and/or reduce parking footprint | Remove parking                           |
| Designated River Access    | New dump station                        | Roadside parking removal                  | Remove informal trail                    |
| Road bridge                | Black Oak Restoration                   | New Boardwalk                             | Retain riprap                            |
| Footbridge                 | Floodplain and Riparian Restoration     | New Trail/Trail reroute                   | Keep riprap and plant                    |
| Lakes/Streams              | Meadow Restoration                      | Trail removal                             | Remove riprap and brushlayer             |
|                            | Potential Meadow and Upland Restoration | New Road                                  | Remove riprap and incorporate large wood |
|                            | Riparian Restoration                    | Road mitigation                           | Remove riprap and revegetate             |
|                            | Wilderness Restoration                  |   |  |
|                            | Surfaced Areas                          |   |  |
|                            | Building                                |   |  |





### ALTERNATIVE 2 MERCED LAKE HIGH SIERRA CAMP



#### Legend

Campground	Bridge Removal	Trails	Brush layer
Picnic Area	Dump Station Removal	New fencing	Revegetate
Parking_Labels selection	Infrastructure Removal	Repair headcut	Fill ditch
Trailhead	Constructed Log Jam/Bioengineer	Remove pipe	Fill removal
Boating put in or take out	Constructed Log Jam	Delineate and/or reduce parking footprint	Road removal
Designated River Access	New dump station	Roadside parking removal	Remove parking
Road bridge	Black Oak Restoration	New Boardwalk	Remove informal trail
Footbridge	Floodplain and Riparian Restoration	New Trail/Trail reroute	Retain riprap
Lakes/Streams	Meadow Restoration	Trail removal	Keep riprap and plant
	Potential Meadow and Upland Restoration	New Road	Remove riprap and brushlayer
	Riparian Restoration	Road mitigation	Remove riprap and incorporate large wood
	Wilderness Restoration		Remove riprap and revegetate
	Surfaced Areas		
	Building		

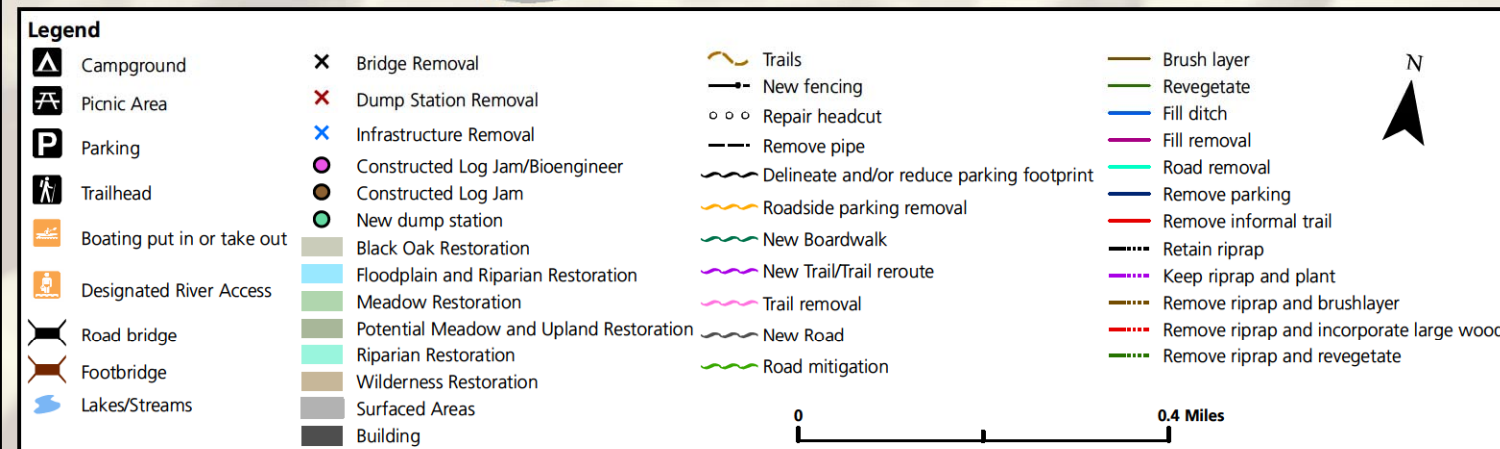
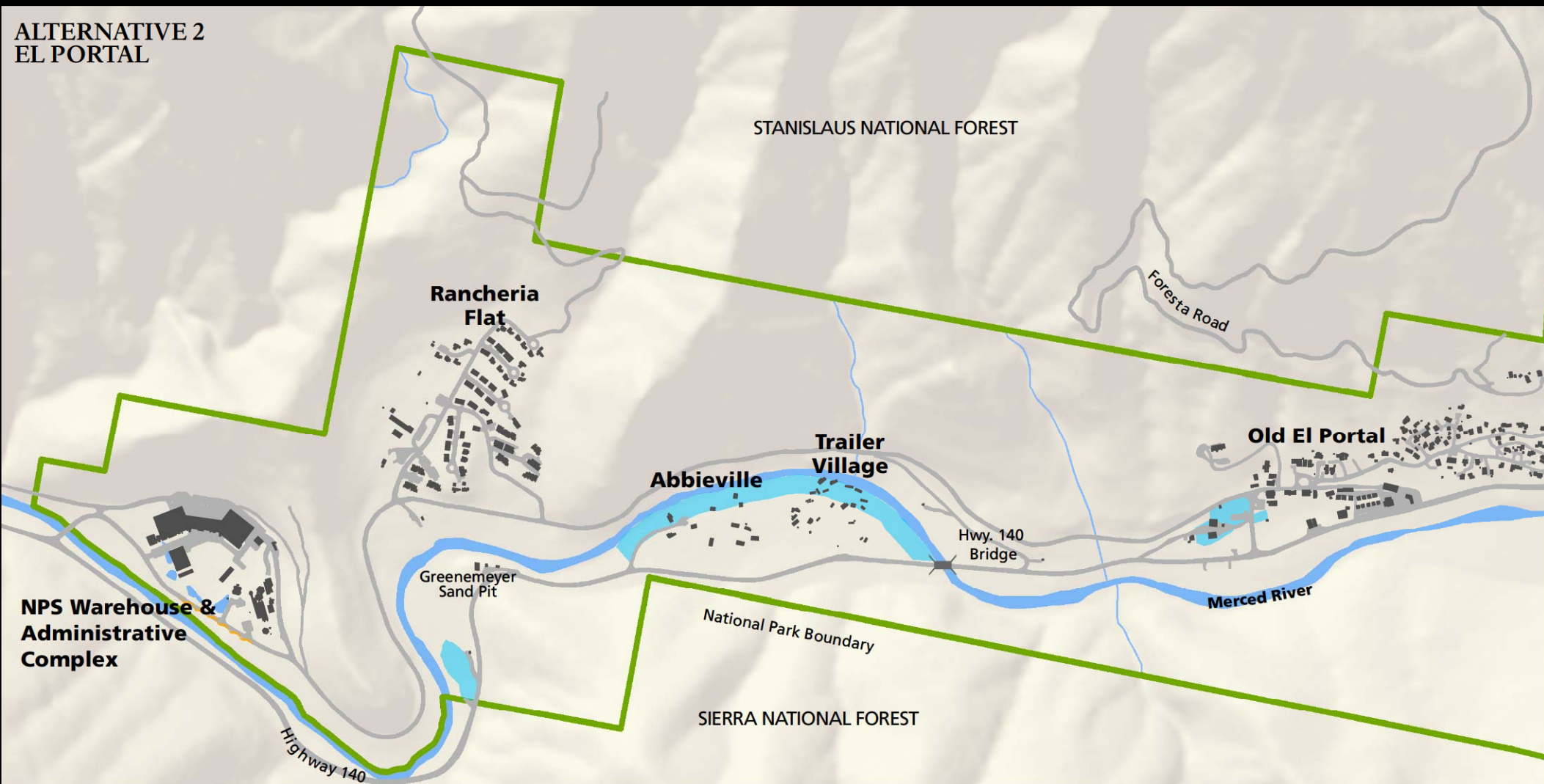
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Merced Lake  
East Meadow



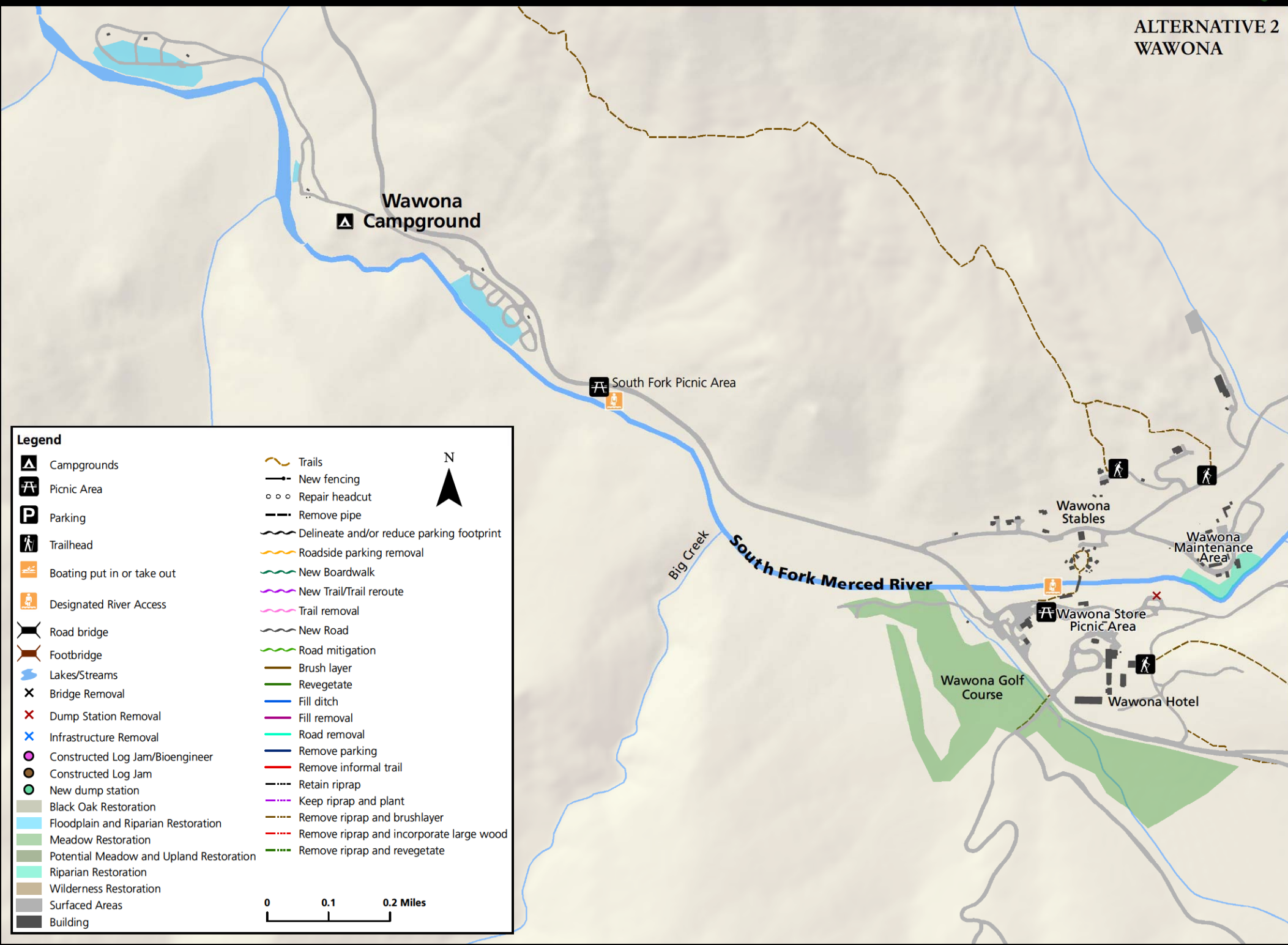
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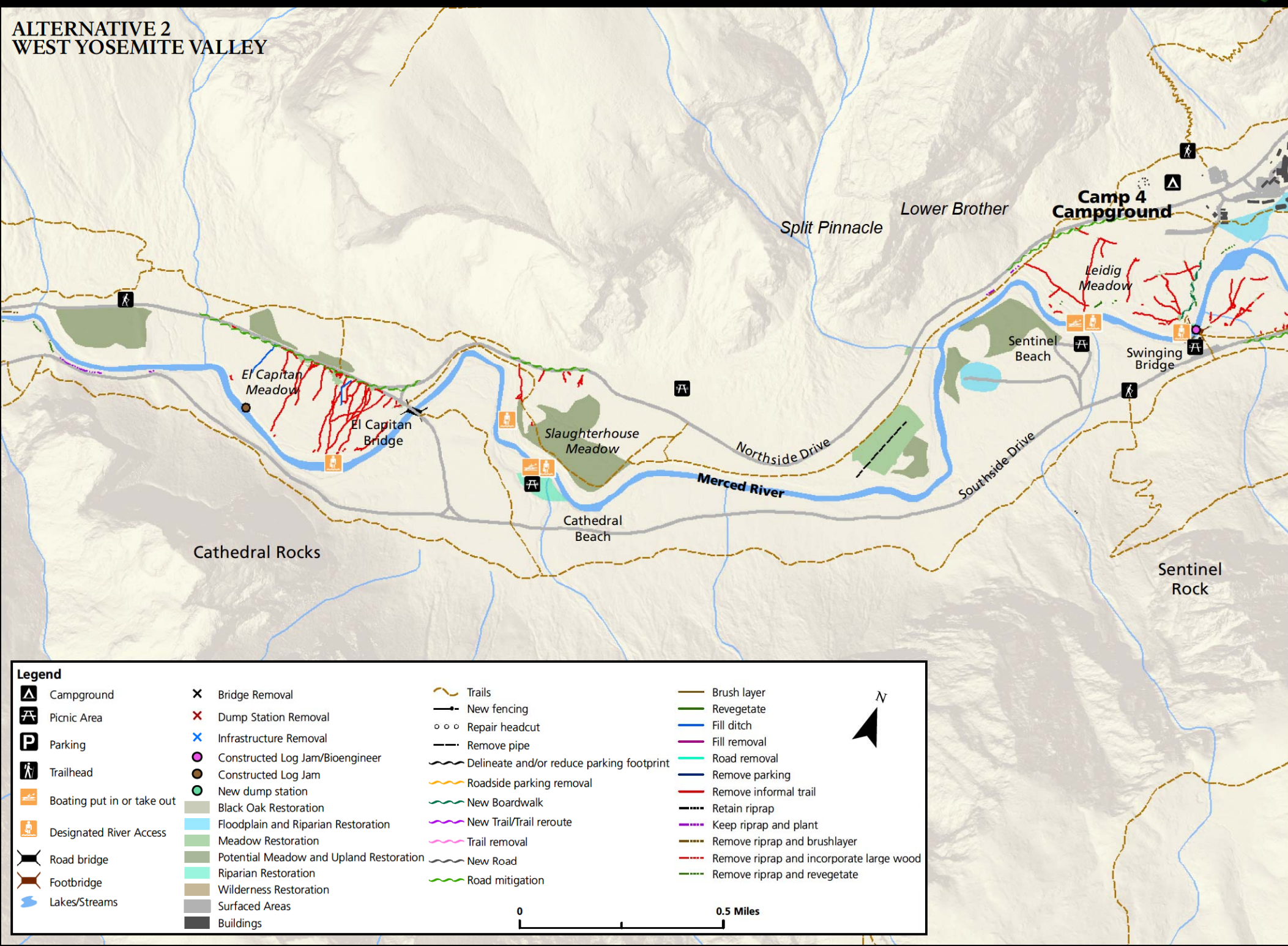
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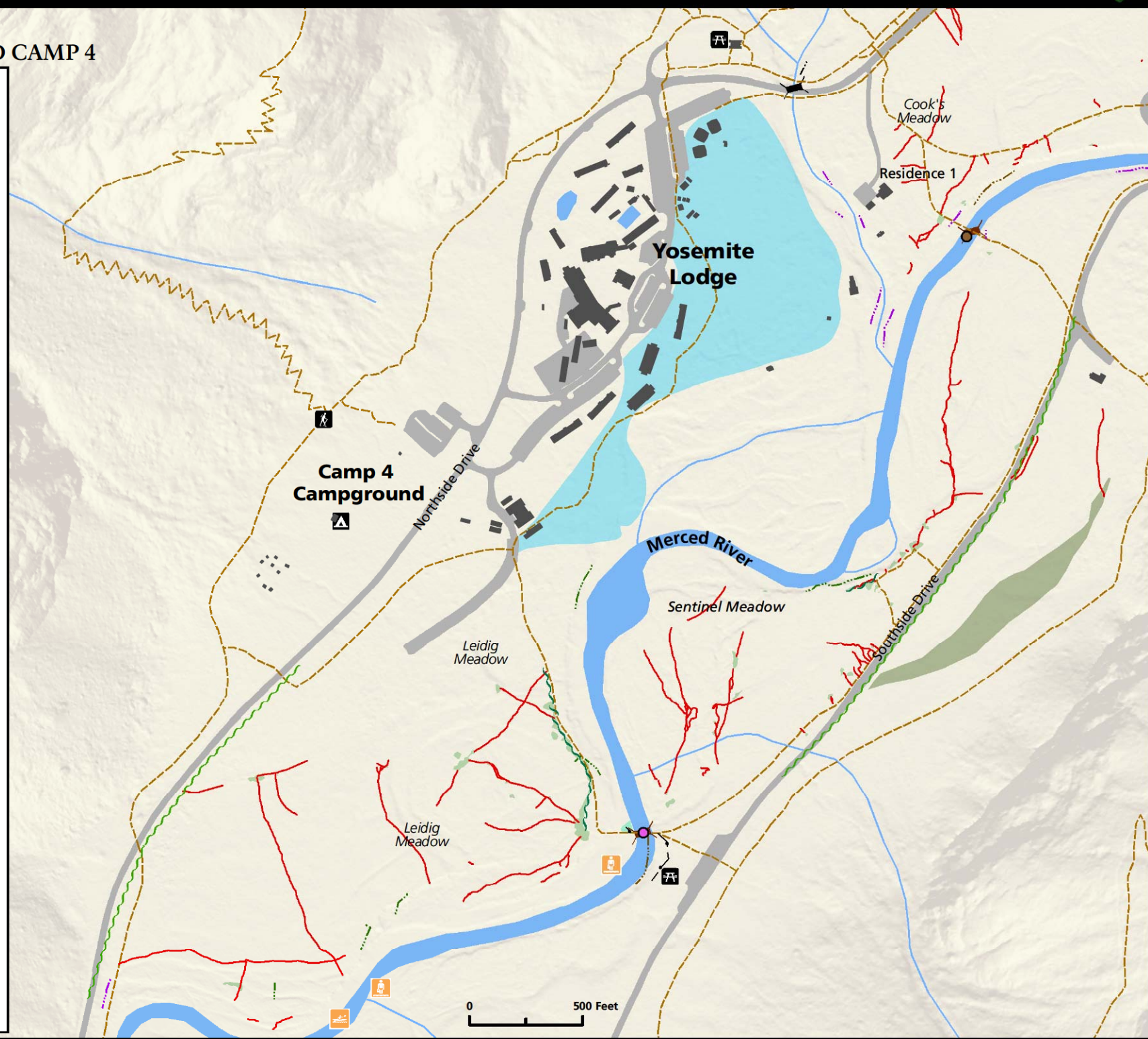
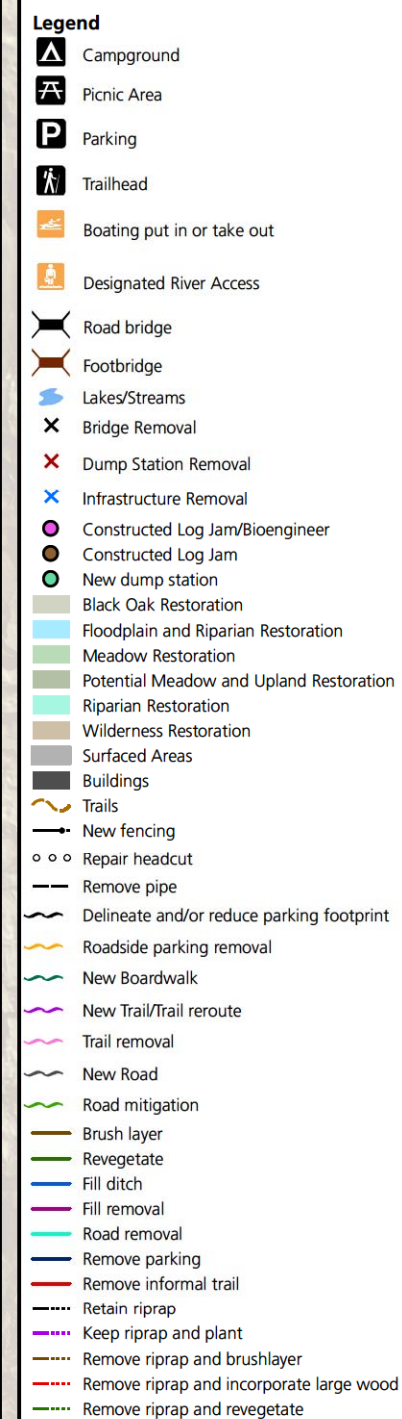
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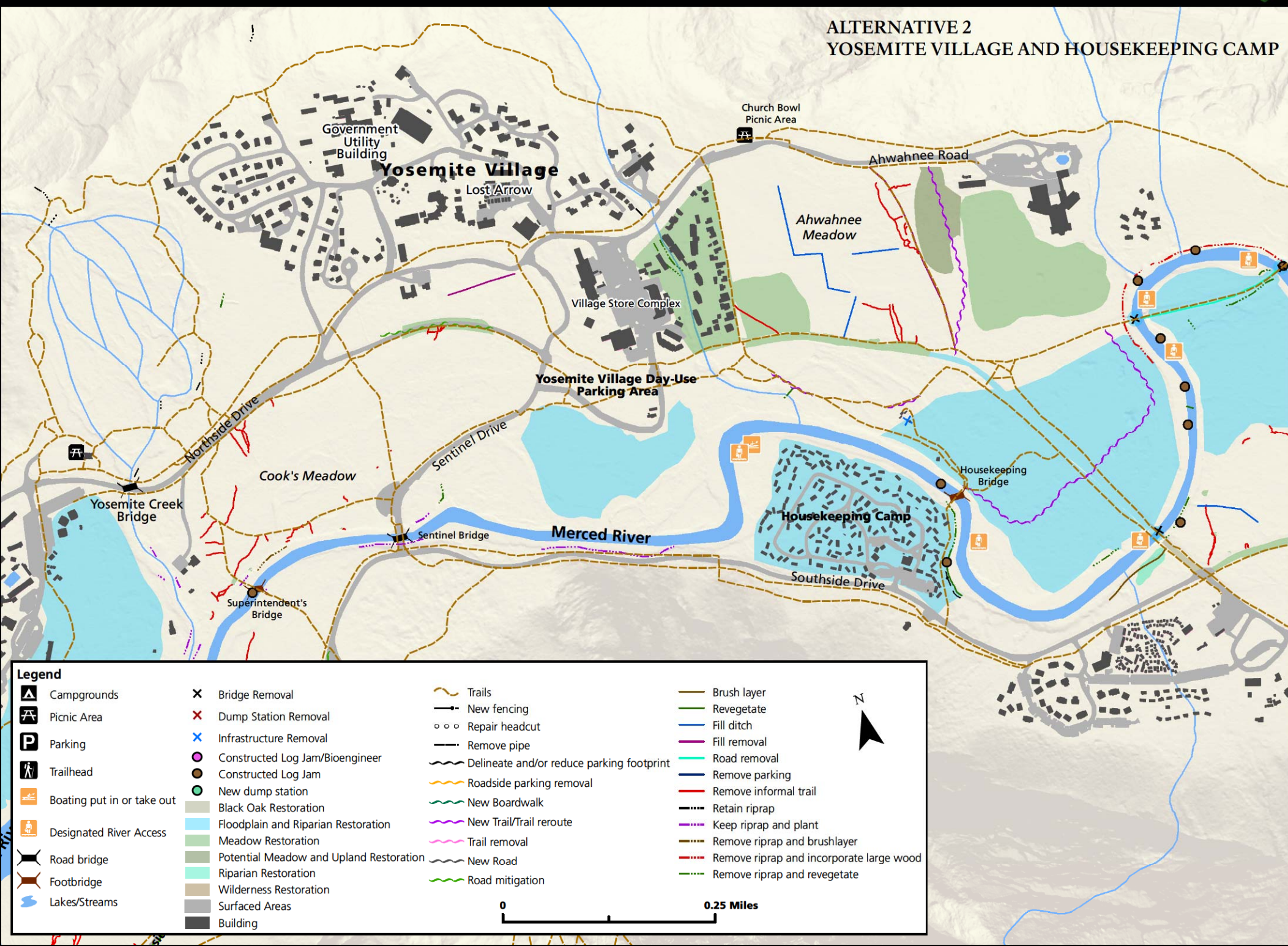
### ALTERNATIVE 2 YOSEMITE LODGE AND CAMP 4







### ALTERNATIVE 2 YOSEMITE VILLAGE AND HOUSEKEEPING CAMP



**Legend**

- Campgrounds
- Picnic Area
- Parking
- Trailhead
- Boating put in or take out
- Designated River Access
- Road bridge
- Footbridge
- Lakes/Streams

- Bridge Removal
- Dump Station Removal
- Infrastructure Removal
- Constructed Log Jam/Bioengineer
- Constructed Log Jam
- New dump station
- Black Oak Restoration
- Floodplain and Riparian Restoration
- Meadow Restoration
- Potential Meadow and Upland Restoration
- Riparian Restoration
- Wilderness Restoration
- Surfaced Areas
- Building

- Trails
- New fencing
- Repair headcut
- Remove pipe
- Delineate and/or reduce parking footprint
- Roadside parking removal
- New Boardwalk
- New Trail/Trail reroute
- Trail removal
- New Road
- Road mitigation

- Brush layer
- Revegetate
- Fill ditch
- Fill removal
- Road removal
- Remove parking
- Remove informal trail
- Retain riprap
- Keep riprap and plant
- Remove riprap and brushlayer
- Remove riprap and incorporate large wood
- Remove riprap and revegetate

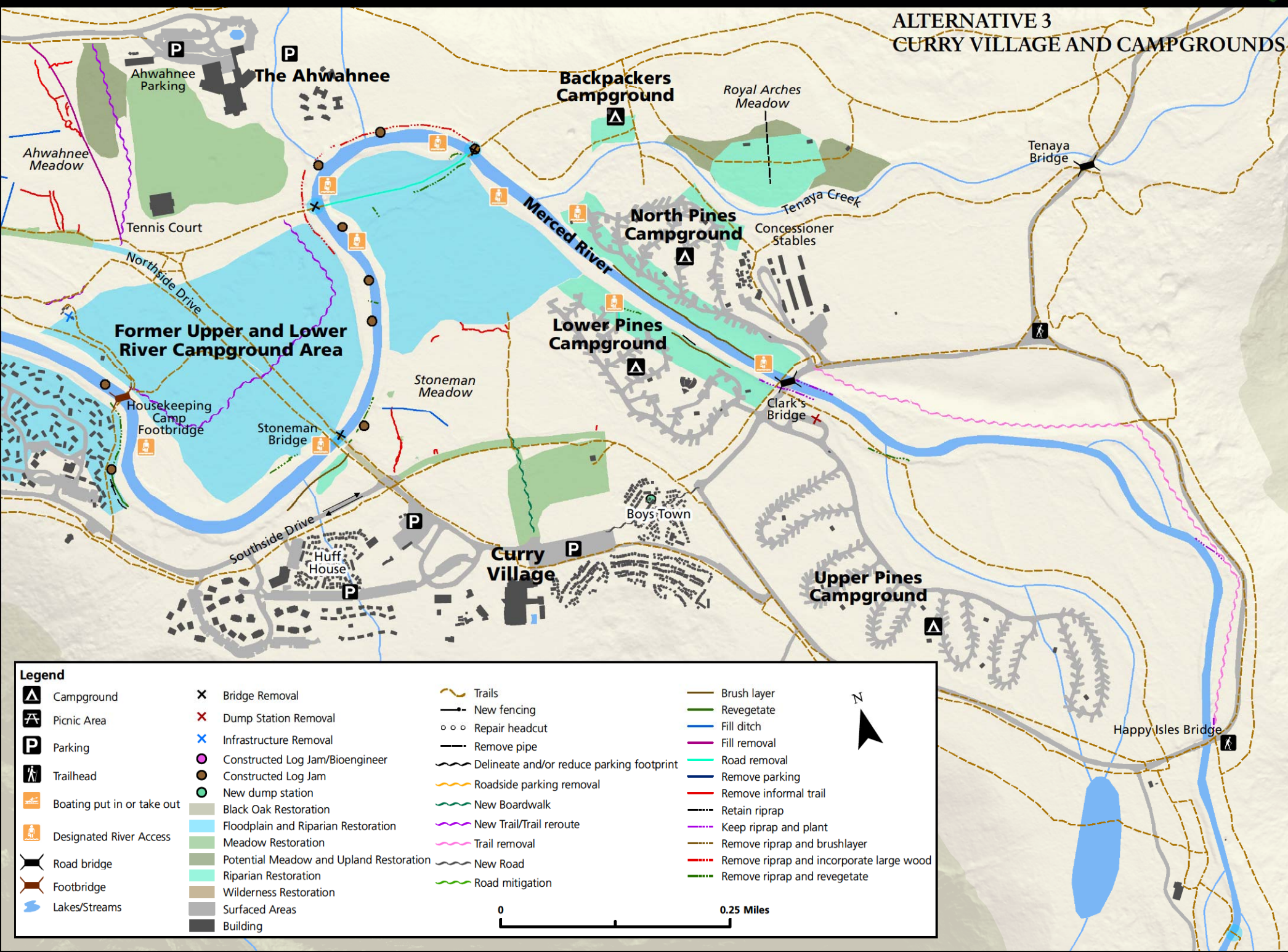
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### ALTERNATIVE 3 CURRY VILLAGE AND CAMPGROUNDS



#### Legend

	Campground		Bridge Removal		Trails		Brush layer
	Picnic Area		Dump Station Removal		New fencing		Revegetate
	Parking		Infrastructure Removal		Repair headcut		Fill ditch
	Trailhead		Constructed Log Jam/Bioengineer		Remove pipe		Fill removal
	Boating put in or take out		Constructed Log Jam		Delineate and/or reduce parking footprint		Road removal
	Designated River Access		New dump station		Roadside parking removal		Remove parking
	Road bridge		Black Oak Restoration		New Boardwalk		Remove informal trail
	Footbridge		Floodplain and Riparian Restoration		New Trail/Trail reroute		Retain riprap
	Lakes/Streams		Meadow Restoration		Trail removal		Keep riprap and plant
			Potential Meadow and Upland Restoration		New Road		Remove riprap and brushlayer
			Riparian Restoration		Road mitigation		Remove riprap and incorporate large wood
			Wilderness Restoration				Remove riprap and revegetate
			Surfaced Areas				
			Building				

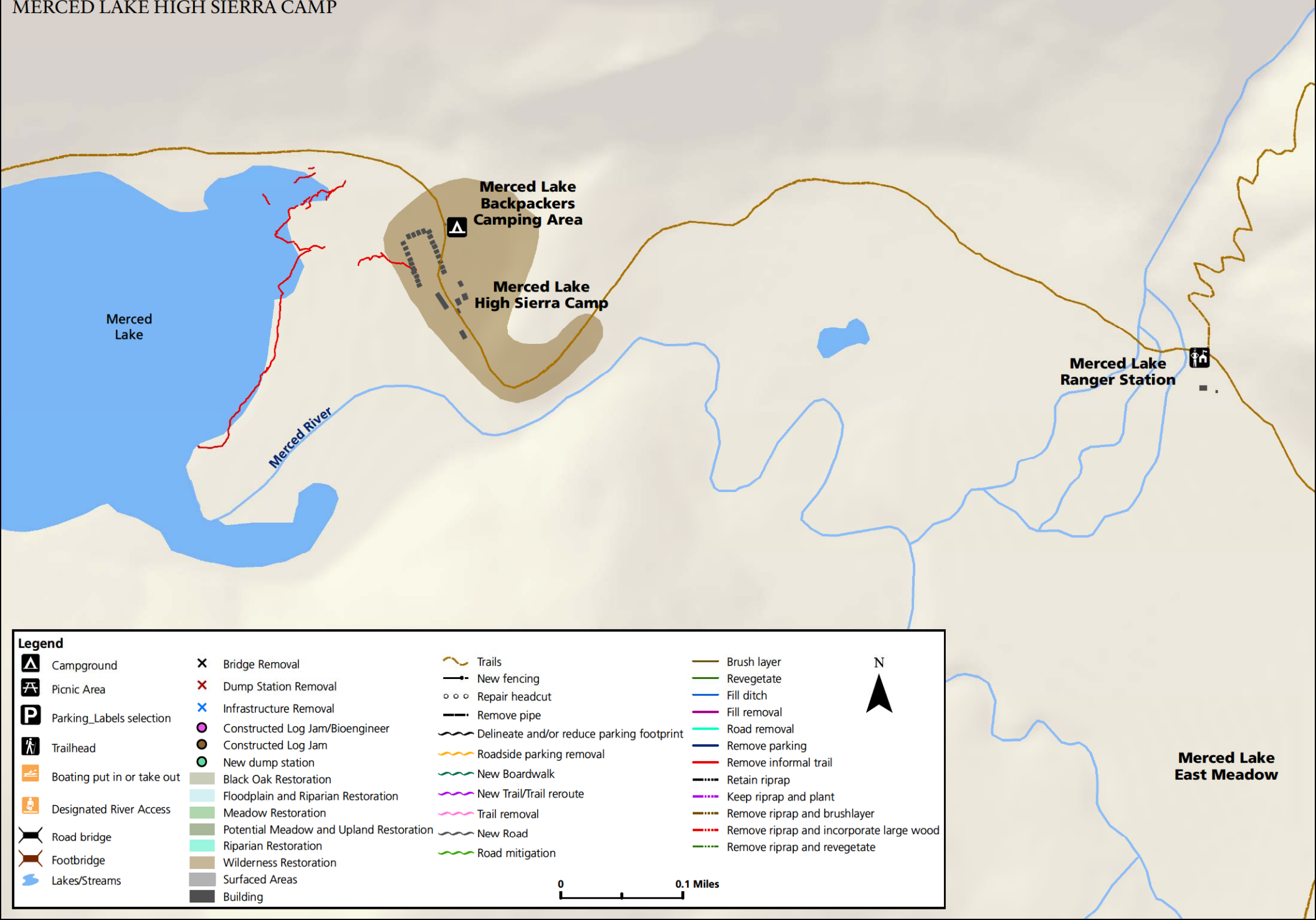
0 0.25 Miles







### ALTERNATIVE 3 MERCED LAKE HIGH SIERRA CAMP



#### Legend

Campground	Bridge Removal	Trails	Brush layer
Picnic Area	Dump Station Removal	New fencing	Revegetate
Parking_Labels selection	Infrastructure Removal	Repair headcut	Fill ditch
Trailhead	Constructed Log Jam/Bioengineer	Remove pipe	Fill removal
Boating put in or take out	Constructed Log Jam	Delineate and/or reduce parking footprint	Road removal
Designated River Access	New dump station	Roadside parking removal	Remove parking
Road bridge	Black Oak Restoration	New Boardwalk	Remove informal trail
Footbridge	Floodplain and Riparian Restoration	New Trail/Trail reroute	Retain riprap
Lakes/Streams	Meadow Restoration	Trail removal	Keep riprap and plant
	Potential Meadow and Upland Restoration	New Road	Remove riprap and brushlayer
	Riparian Restoration	Road mitigation	Remove riprap and incorporate large wood
	Wilderness Restoration		Remove riprap and revegetate
	Surfaced Areas		
	Building		

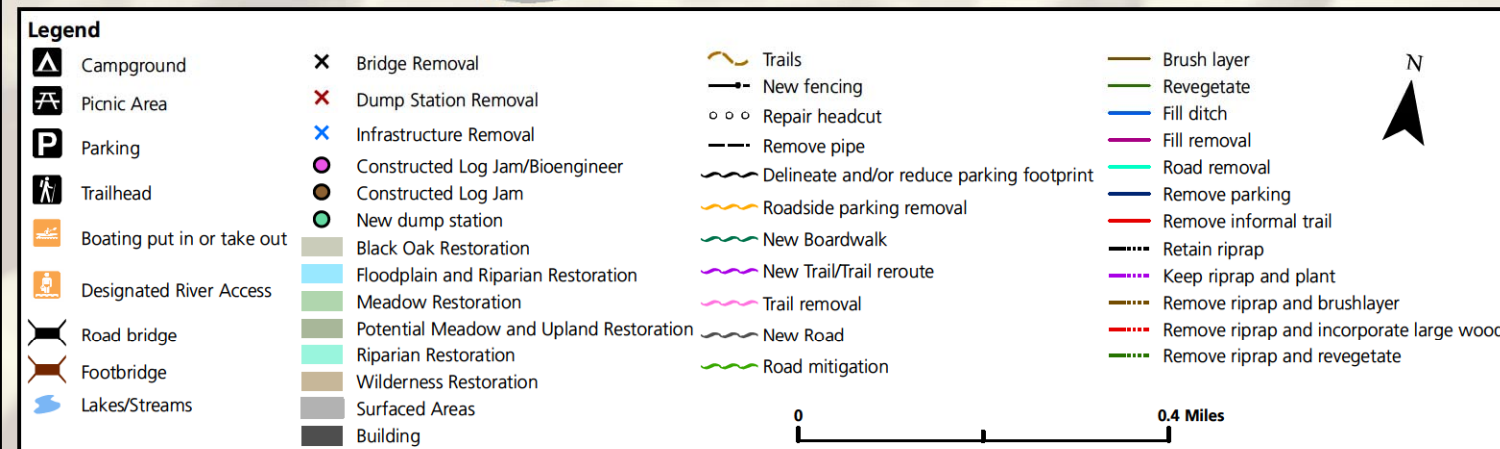
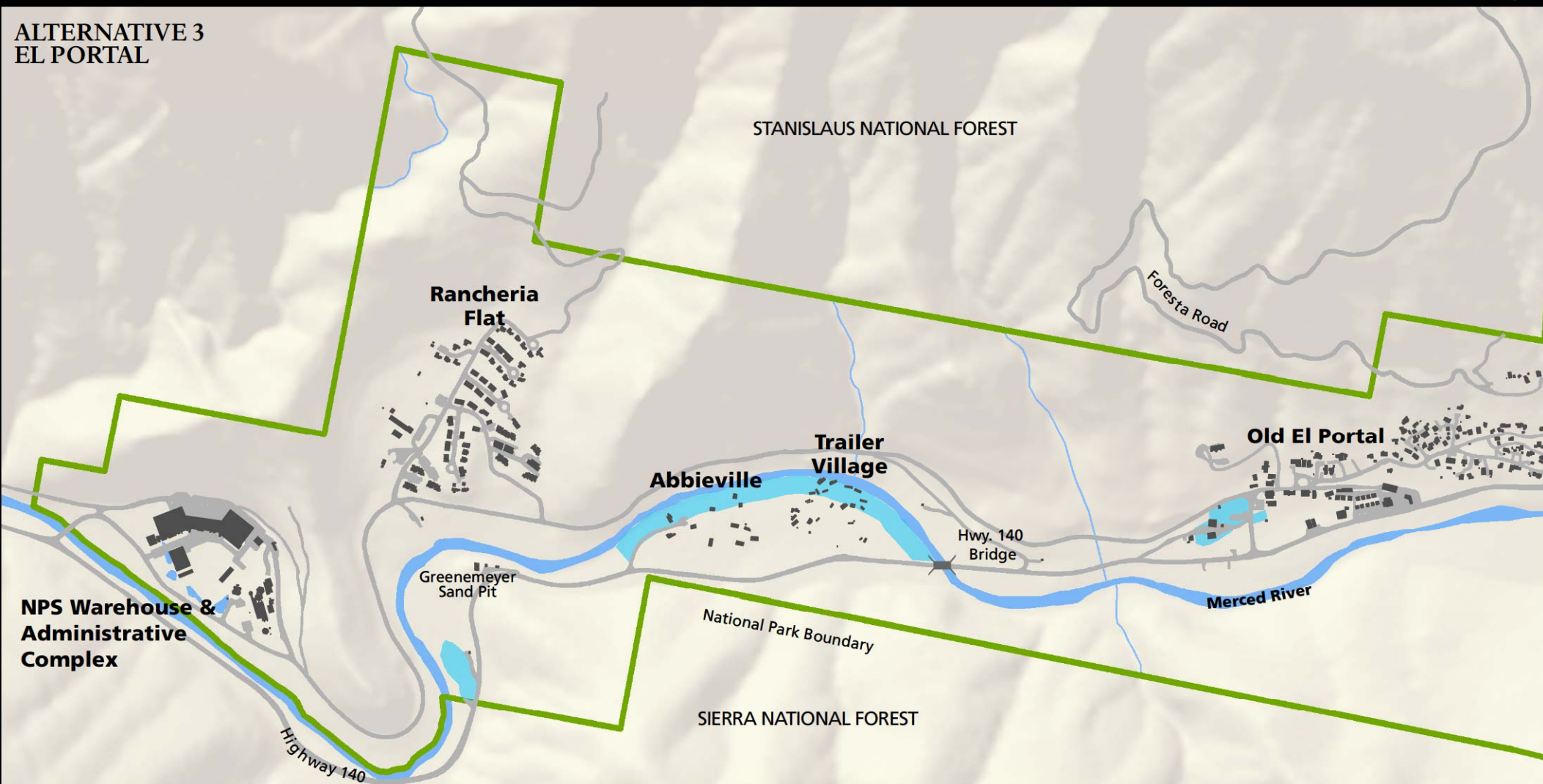
0 0.1 Miles



Merced Lake  
East Meadow



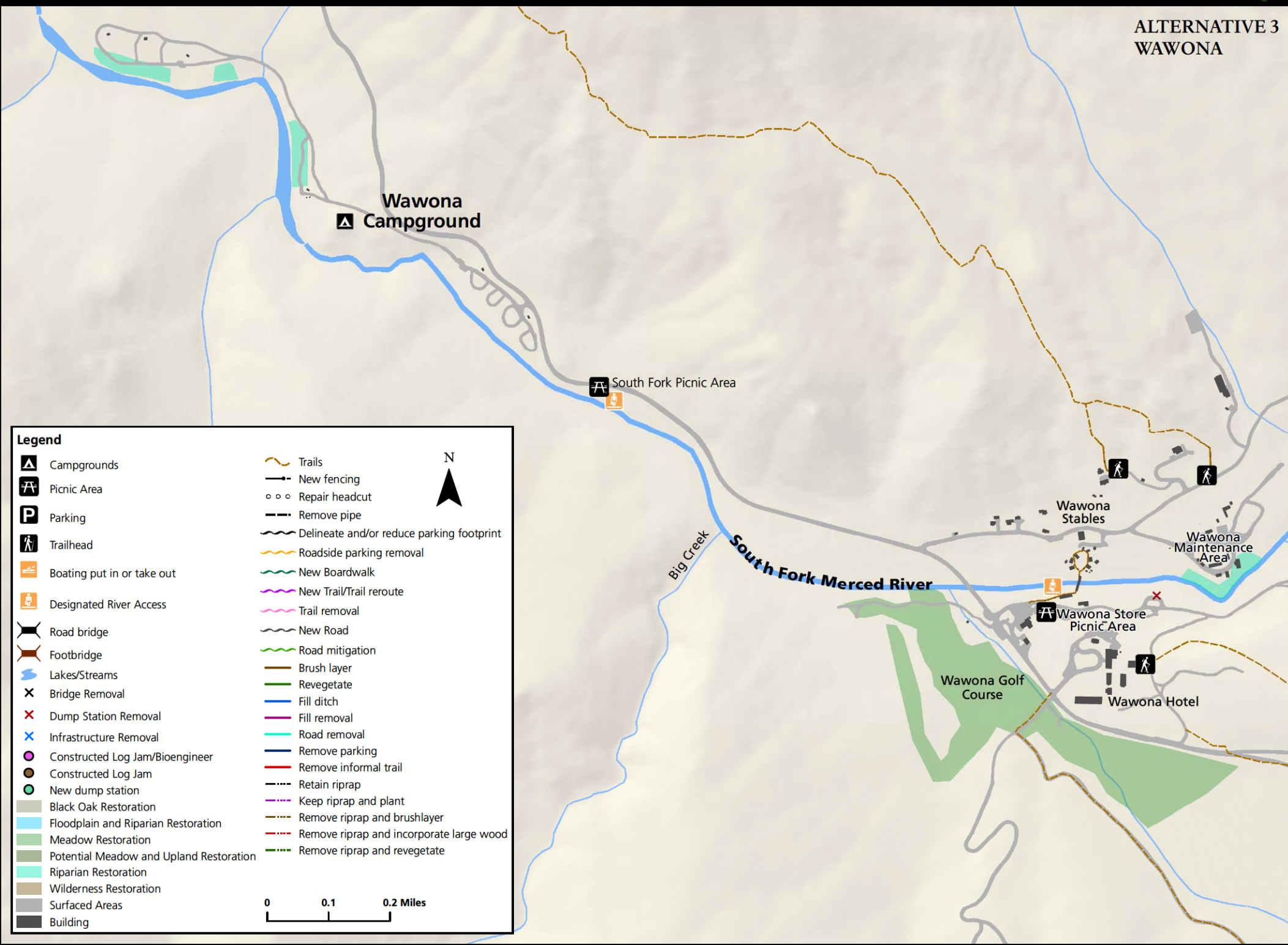
### ALTERNATIVE 3 EL PORTAL







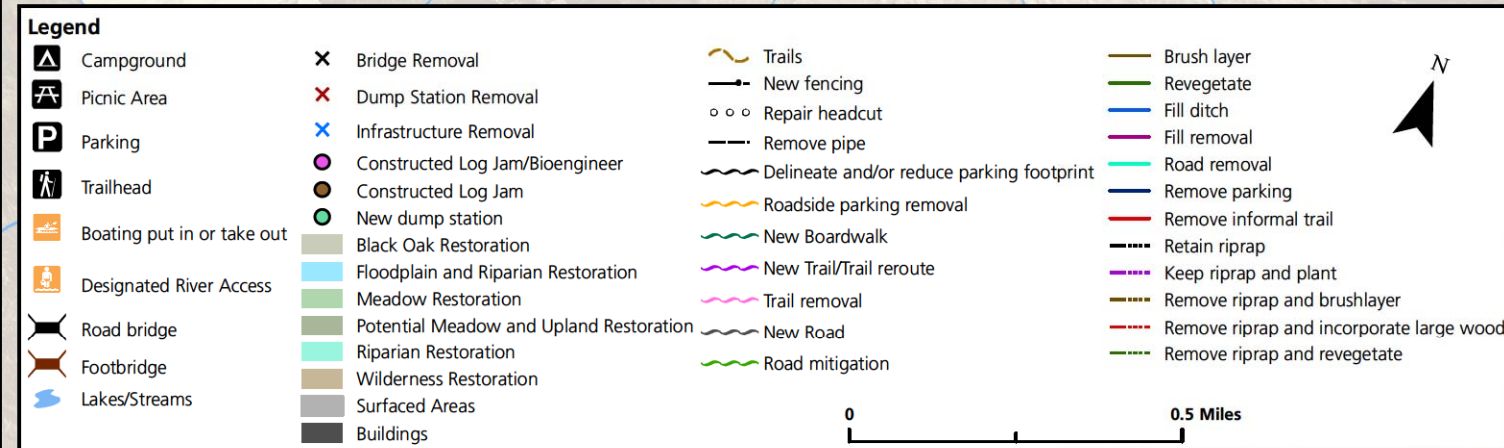
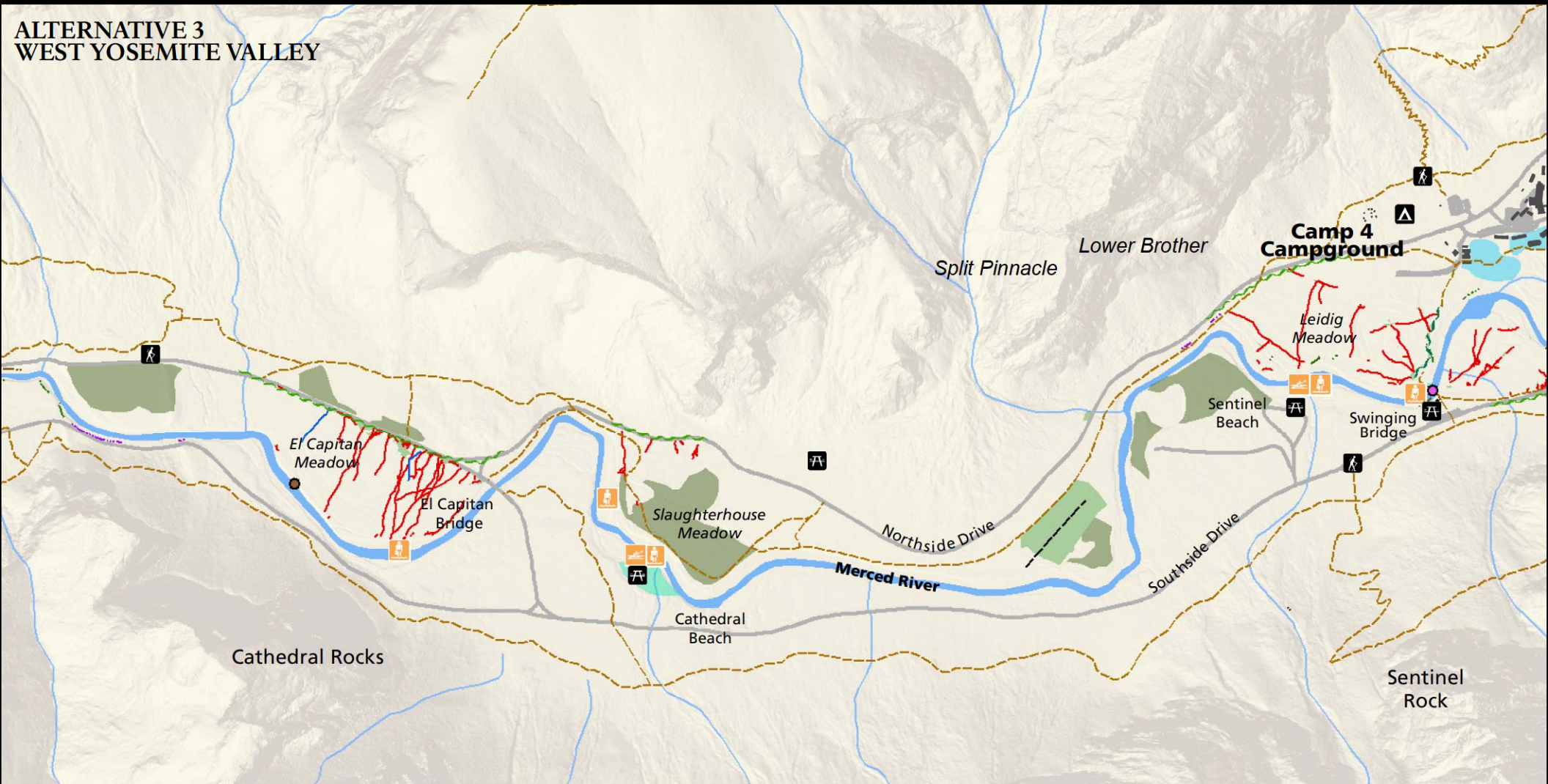
### ALTERNATIVE 3 WAWONA







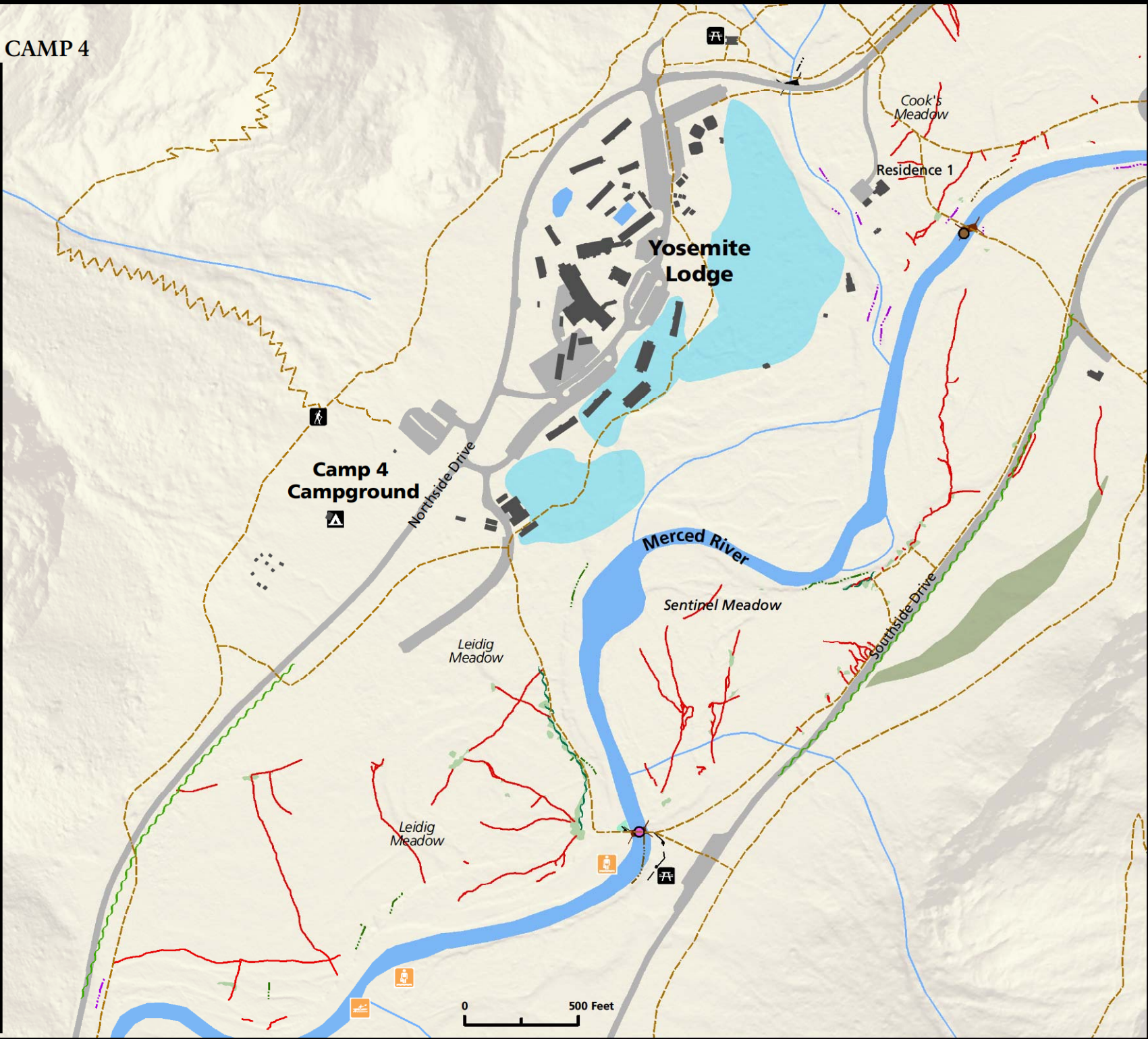
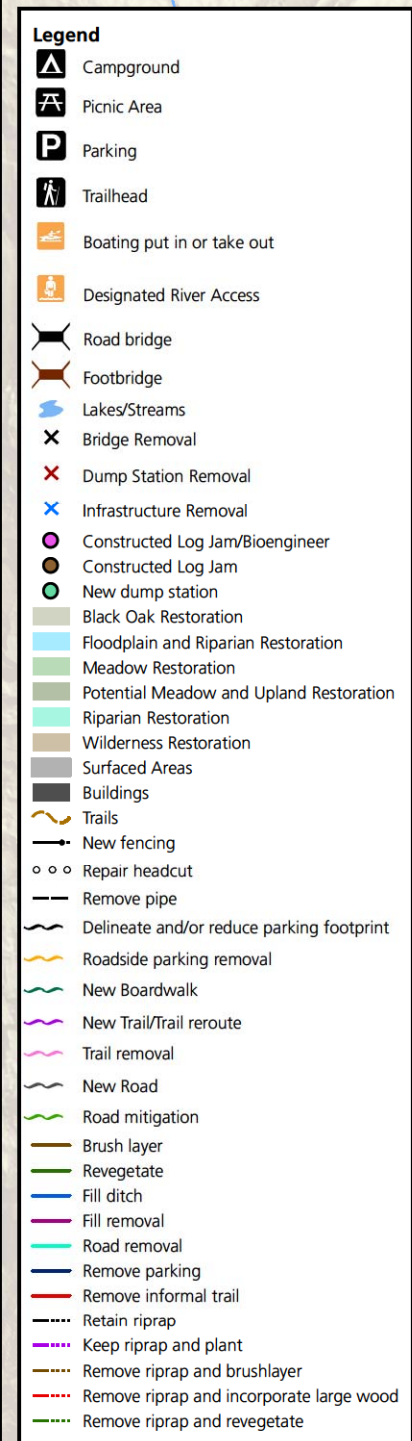
### ALTERNATIVE 3 WEST YOSEMITE VALLEY







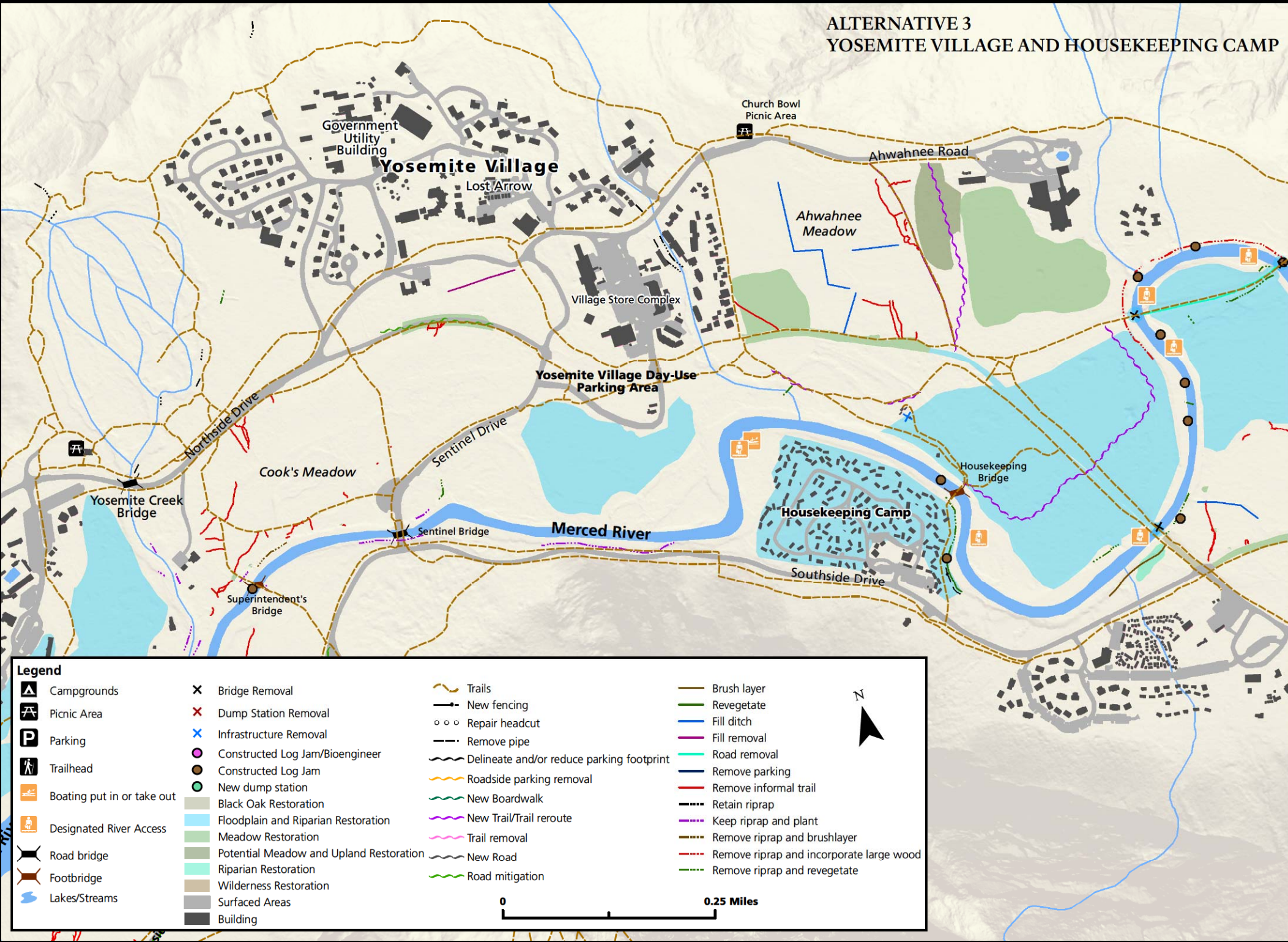
### ALTERNATIVE 3 YOSEMITE LODGE AND CAMP 4







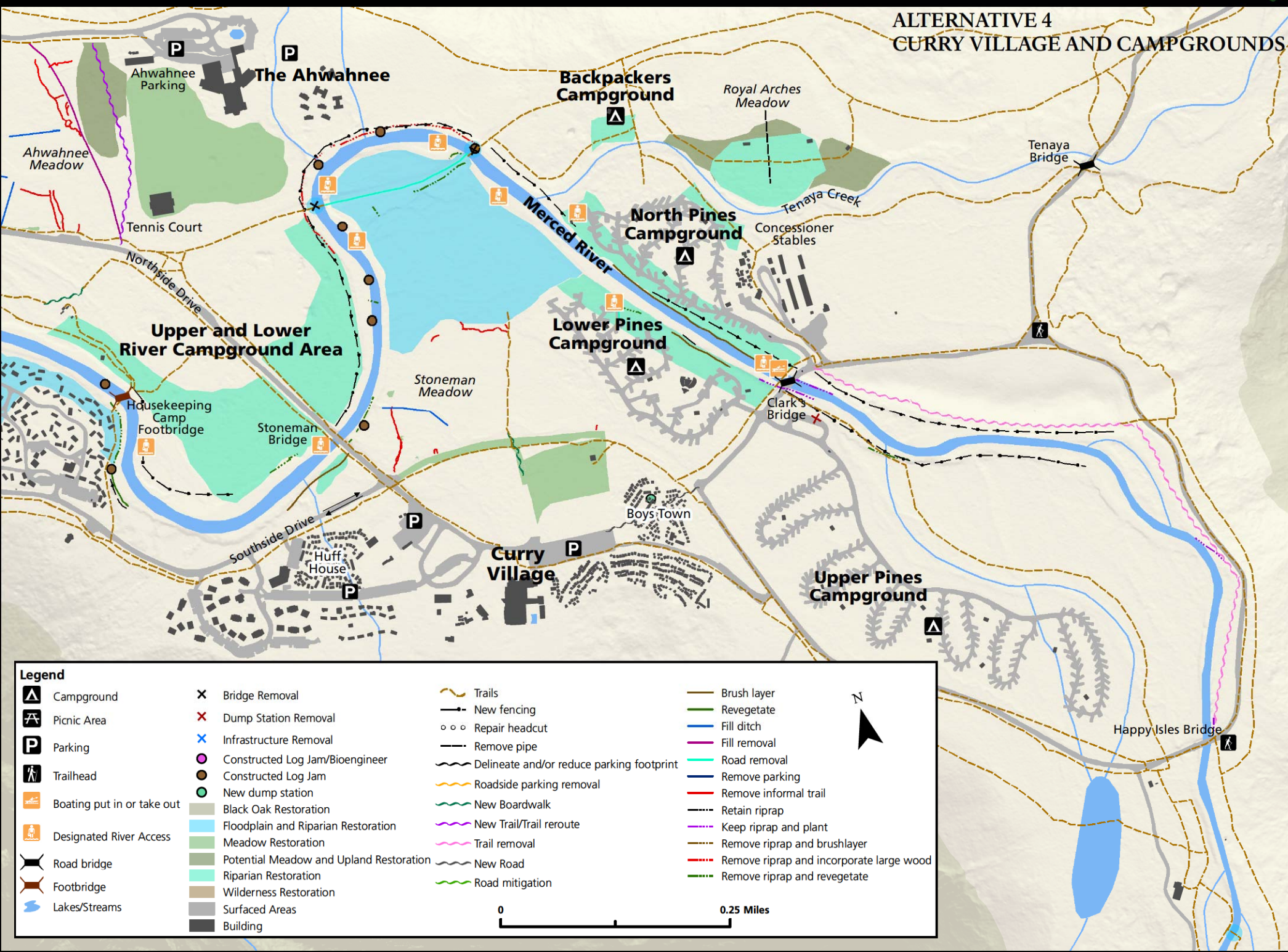
### ALTERNATIVE 3 YOSEMITE VILLAGE AND HOUSEKEEPING CAMP







### ALTERNATIVE 4 CURRY VILLAGE AND CAMPGROUNDS



#### Legend

- |                            |   |   |  |
|----------------------------|---|---|--|
| Campground                 | Bridge Removal                          | Trails                                    | Brush layer                              |
| Picnic Area                | Dump Station Removal                    | New fencing                               | Revegetate                               |
| Parking                    | Infrastructure Removal                  | Repair headcut                            | Fill ditch                               |
| Trailhead                  | Constructed Log Jam/Bioengineer         | Remove pipe                               | Fill removal                             |
| Boating put in or take out | Constructed Log Jam                     | Delineate and/or reduce parking footprint | Road removal                             |
| Designated River Access    | New dump station                        | Roadside parking removal                  | Remove parking                           |
| Road bridge                | Black Oak Restoration                   | New Boardwalk                             | Remove informal trail                    |
| Footbridge                 | Floodplain and Riparian Restoration     | New Trail/Trail reroute                   | Retain riprap                            |
| Lakes/Streams              | Meadow Restoration                      | Trail removal                             | Keep riprap and plant                    |
|                            | Potential Meadow and Upland Restoration | New Road                                  | Remove riprap and brushlayer             |
|                            | Riparian Restoration                    | Road mitigation                           | Remove riprap and incorporate large wood |
|                            | Wilderness Restoration                  |   | Remove riprap and revegetate             |
|                            | Surfaced Areas                          |   |  |
|                            | Building                                |   |  |

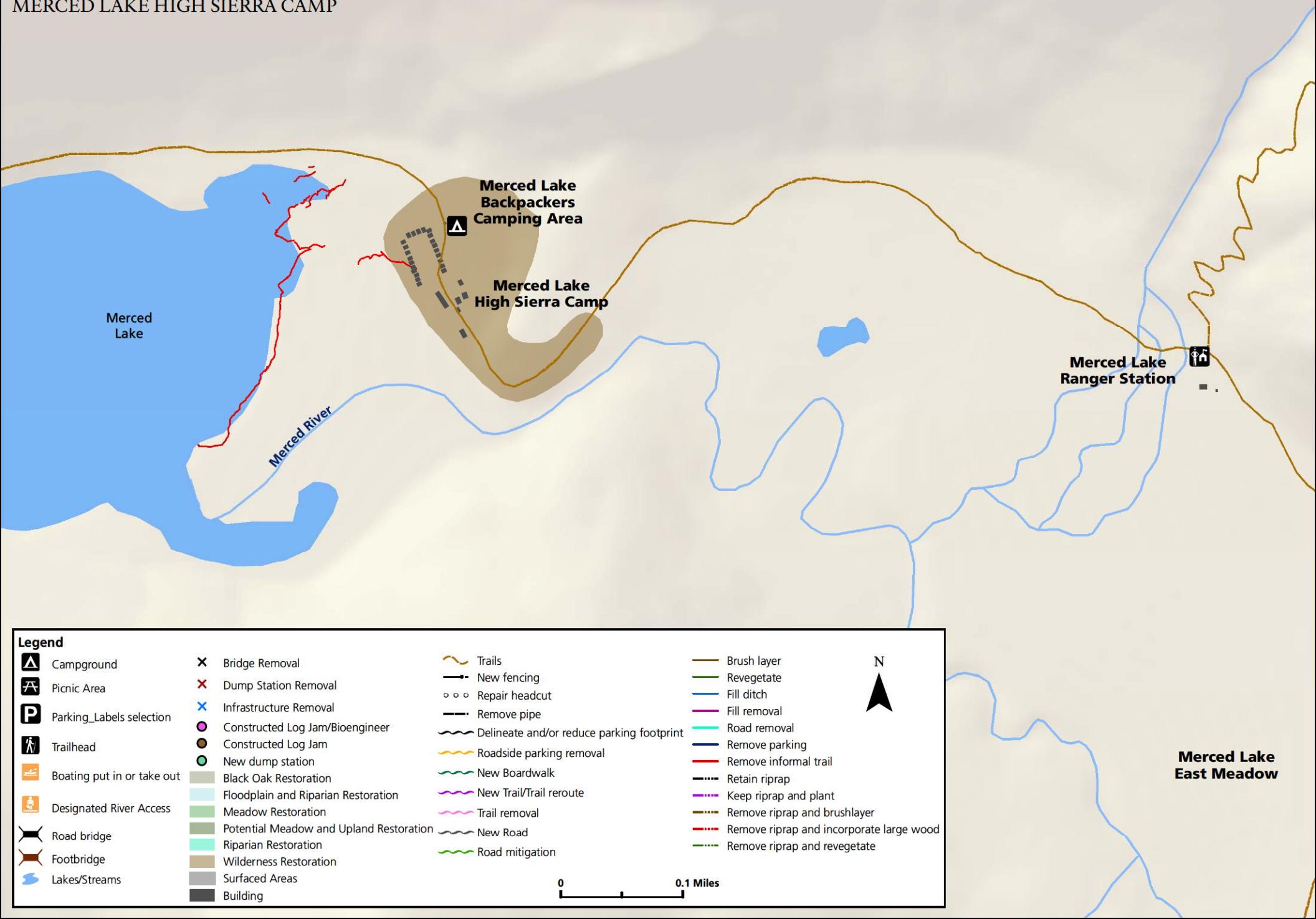
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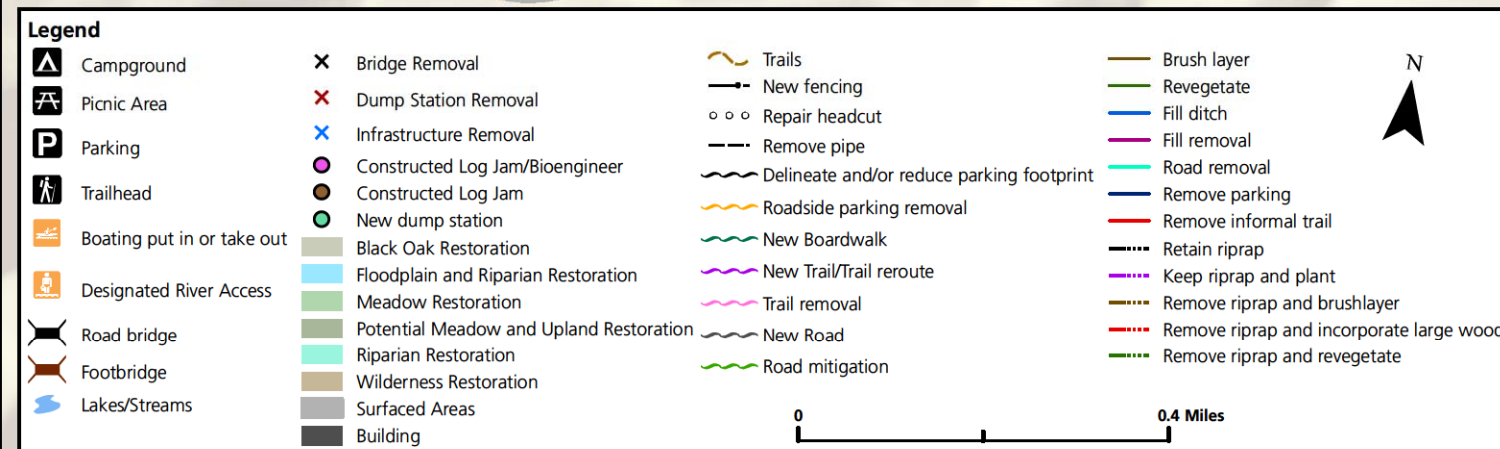
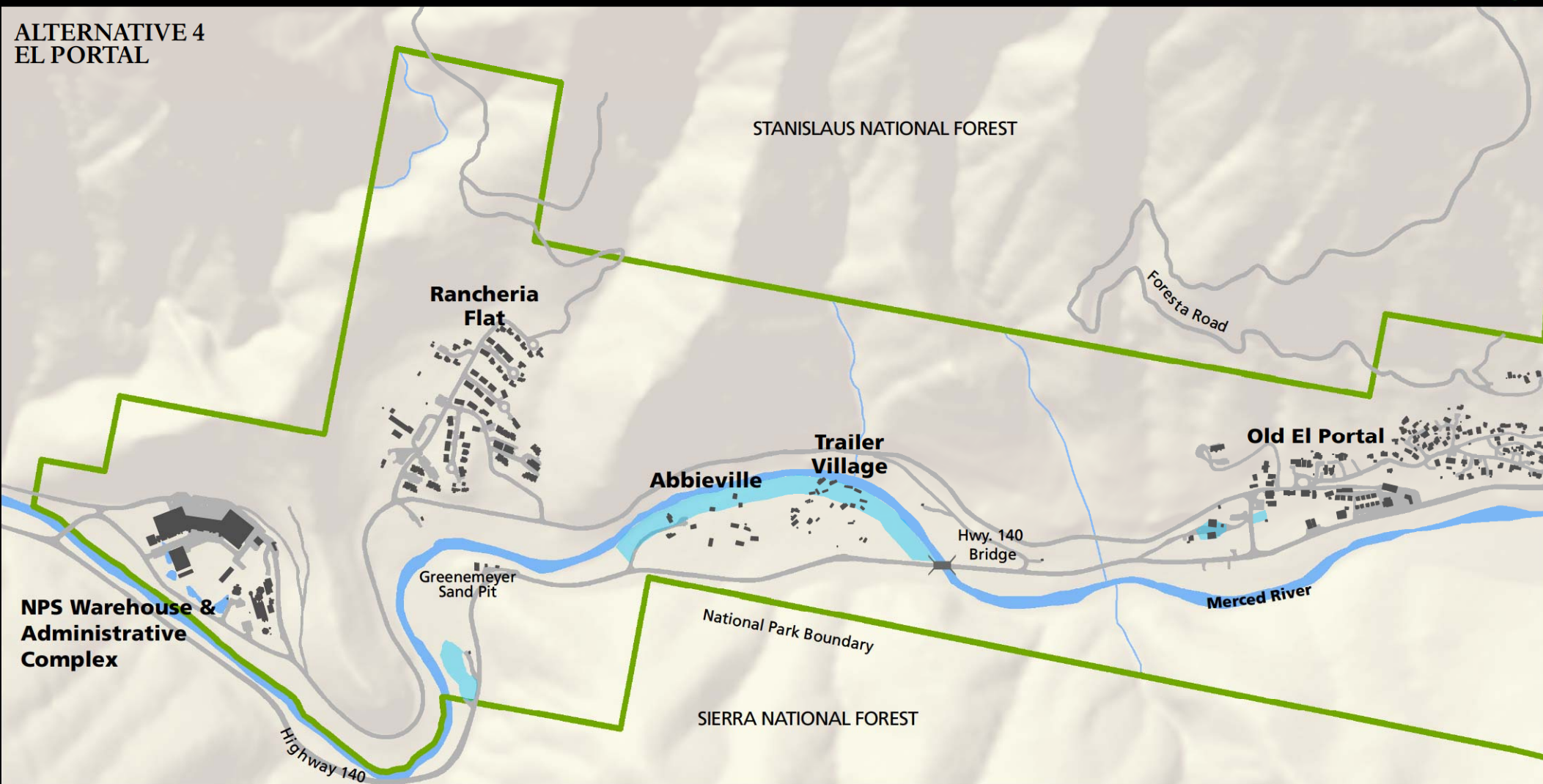
### ALTERNATIVE 4 MERCED LAKE HIGH SIERRA CAMP





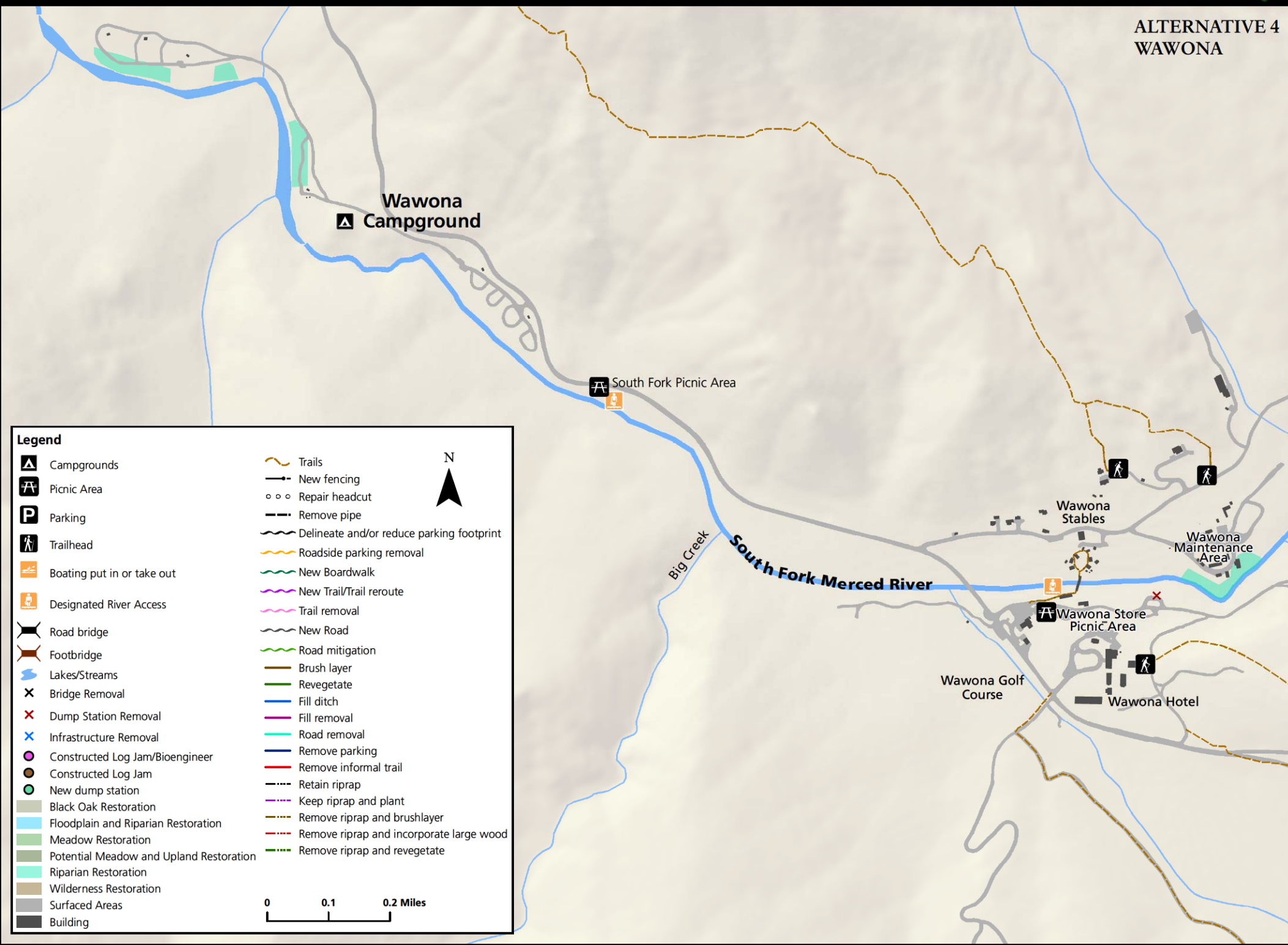


### ALTERNATIVE 4 EL PORTAL





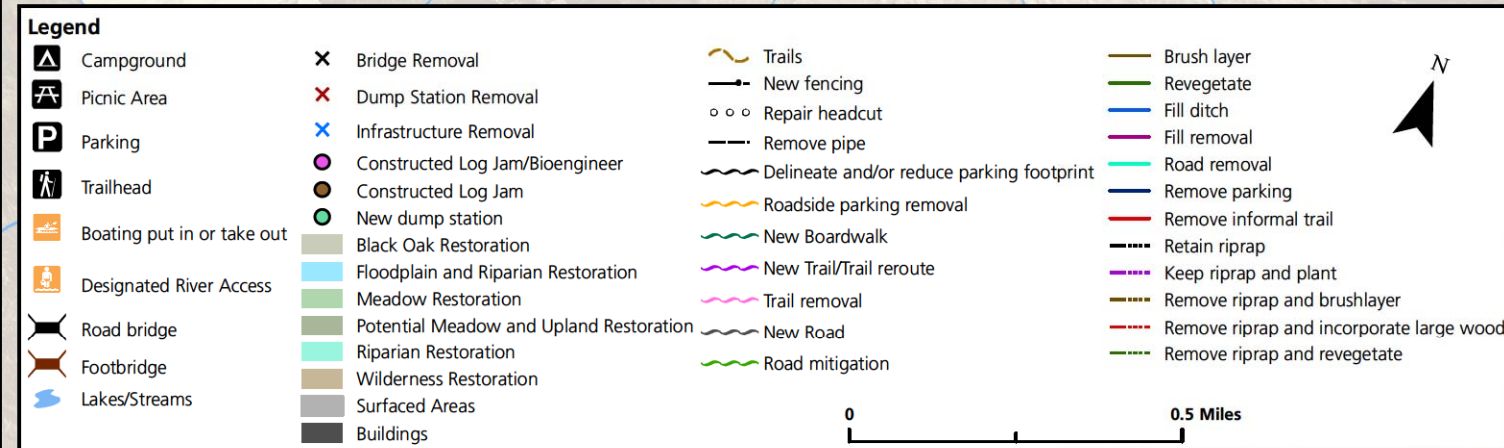
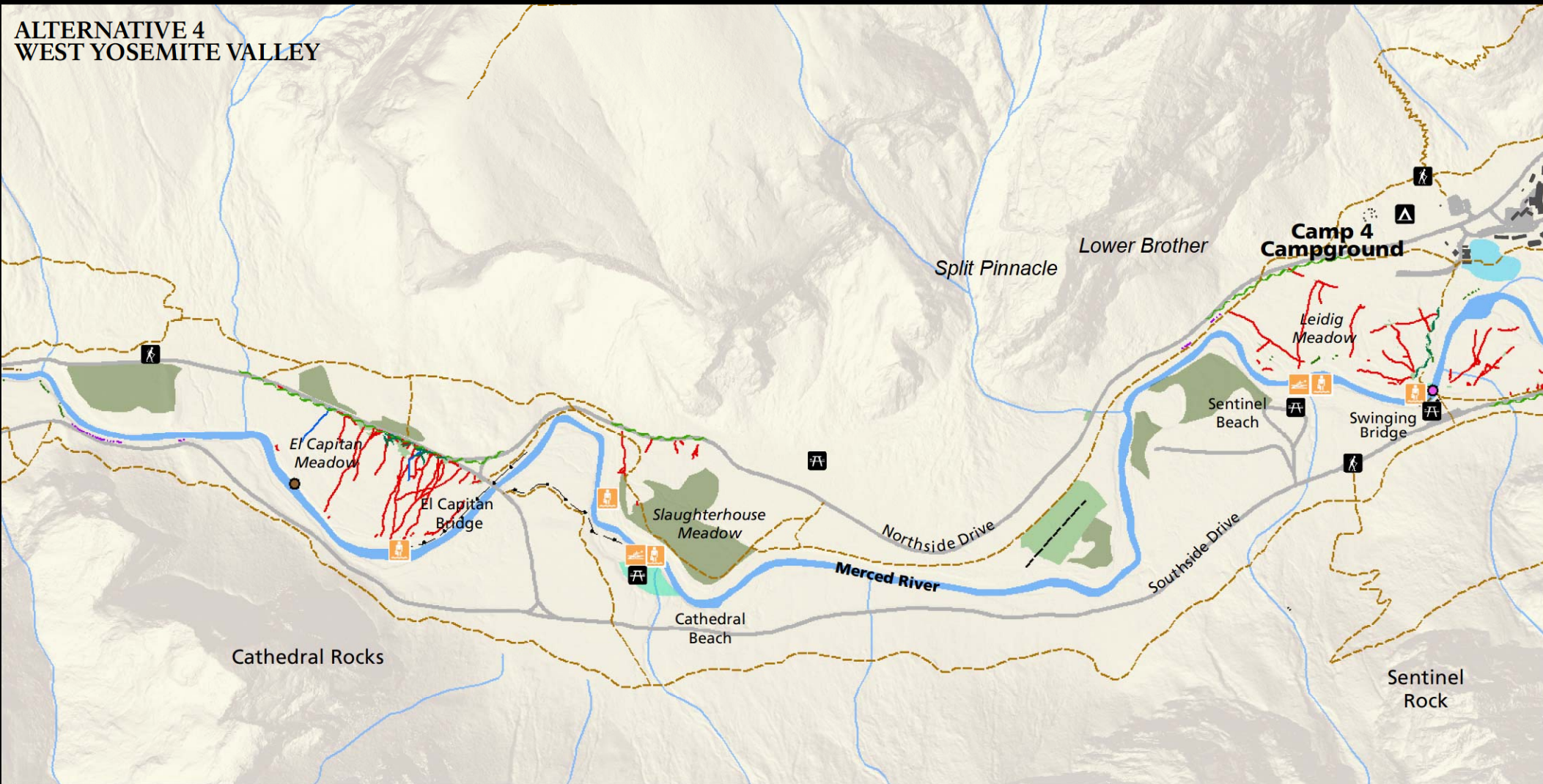
### ALTERNATIVE 4 WAWONA







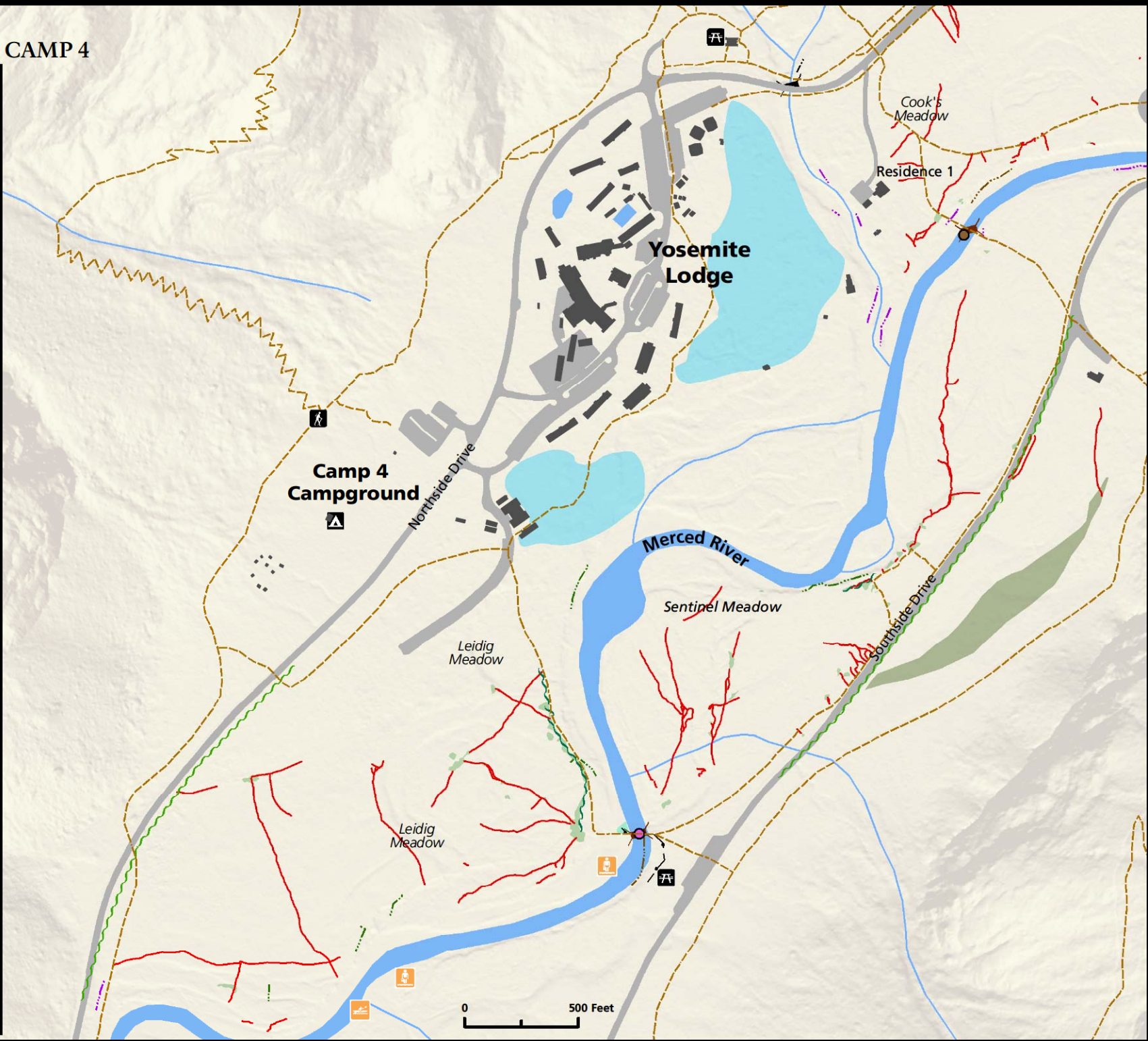
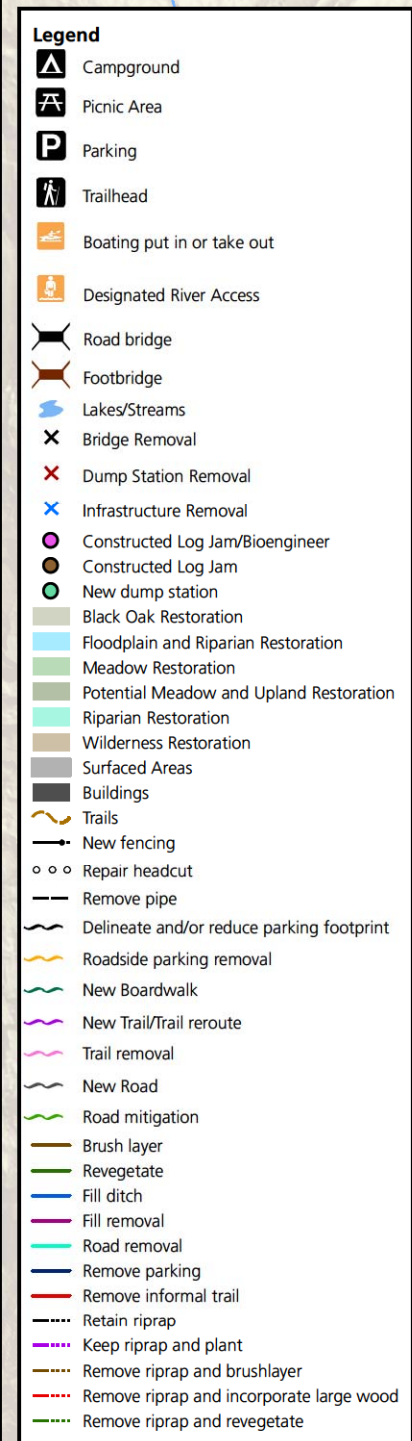
### ALTERNATIVE 4 WEST YOSEMITE VALLEY







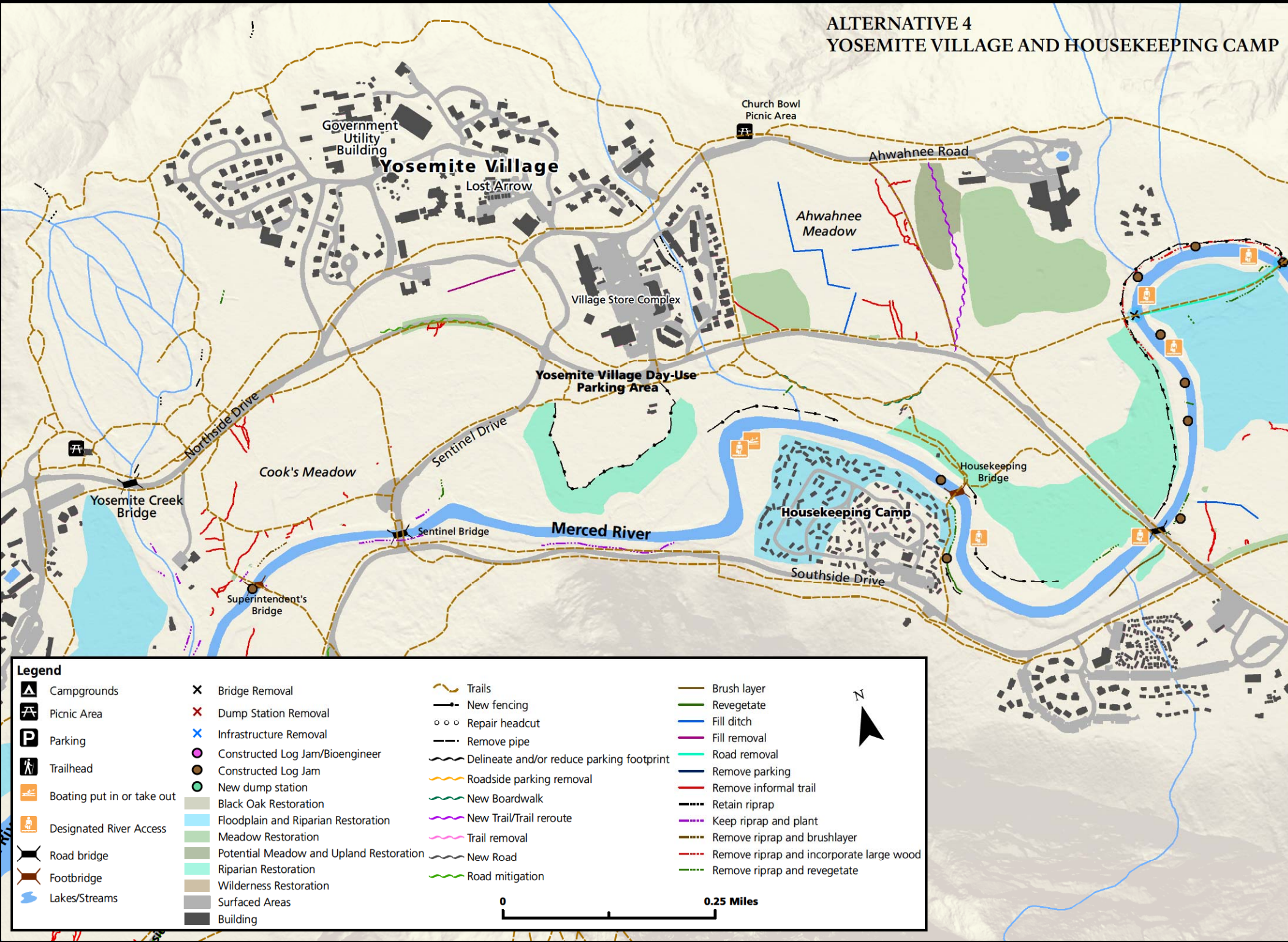
### ALTERNATIVE 4 YOSEMITE LODGE AND CAMP 4







### ALTERNATIVE 4 YOSEMITE VILLAGE AND HOUSEKEEPING CAMP



#### Legend

	Campgrounds		Bridge Removal		Trails		Brush layer
	Picnic Area		Dump Station Removal		New fencing		Revegetate
	Parking		Infrastructure Removal		Repair headcut		Fill ditch
	Trailhead		Constructed Log Jam/Bioengineer		Remove pipe		Fill removal
	Boating put in or take out		Constructed Log Jam		Delineate and/or reduce parking footprint		Road removal
	Designated River Access		New dump station		Roadside parking removal		Remove parking
	Road bridge		Black Oak Restoration		New Boardwalk		Remove informal trail
	Footbridge		Floodplain and Riparian Restoration		New Trail/Trail reroute		Retain riprap
	Lakes/Streams		Meadow Restoration		Trail removal		Keep riprap and plant
			Potential Meadow and Upland Restoration		New Road		Remove riprap and brushlayer
			Riparian Restoration		Road mitigation		Remove riprap and incorporate large wood
			Wilderness Restoration				Remove riprap and revegetate
			Surfaced Areas				
			Building				

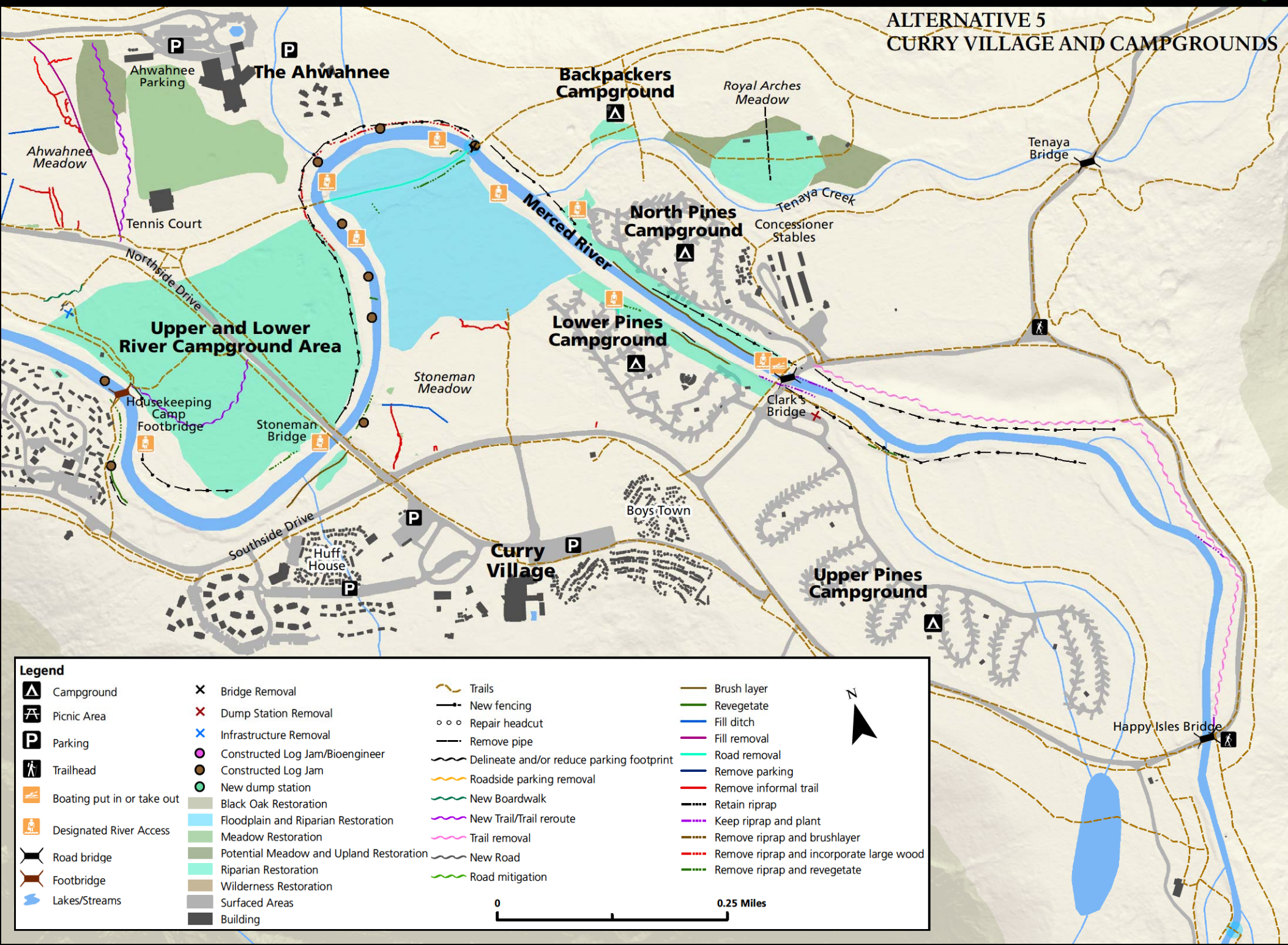
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### ALTERNATIVE 5 CURRY VILLAGE AND CAMPGROUNDS



#### Legend

- |                            |   |   |  |
|----------------------------|---|---|--|
| Campground                 | Bridge Removal                          | Trails                                    | Brush layer                              |
| Picnic Area                | Dump Station Removal                    | New fencing                               | Revegetate                               |
| Parking                    | Infrastructure Removal                  | Repair headcut                            | Fill ditch                               |
| Trailhead                  | Constructed Log Jam/Bioengineer         | Remove pipe                               | Fill removal                             |
| Boating put in or take out | Constructed Log Jam                     | Delineate and/or reduce parking footprint | Road removal                             |
| Designated River Access    | New dump station                        | Roadside parking removal                  | Remove parking                           |
| Road bridge                | Black Oak Restoration                   | New Boardwalk                             | Remove informal trail                    |
| Footbridge                 | Floodplain and Riparian Restoration     | New Trail/Trail reroute                   | Retain riprap                            |
| Lakes/Streams              | Meadow Restoration                      | Trail removal                             | Keep riprap and plant                    |
|                            | Potential Meadow and Upland Restoration | New Road                                  | Remove riprap and brushlayer             |
|                            | Riparian Restoration                    | Road mitigation                           | Remove riprap and incorporate large wood |
|                            | Wilderness Restoration                  |   | Remove riprap and revegetate             |
|                            | Surfaced Areas                          |   |  |
|                            | Building                                |   |  |

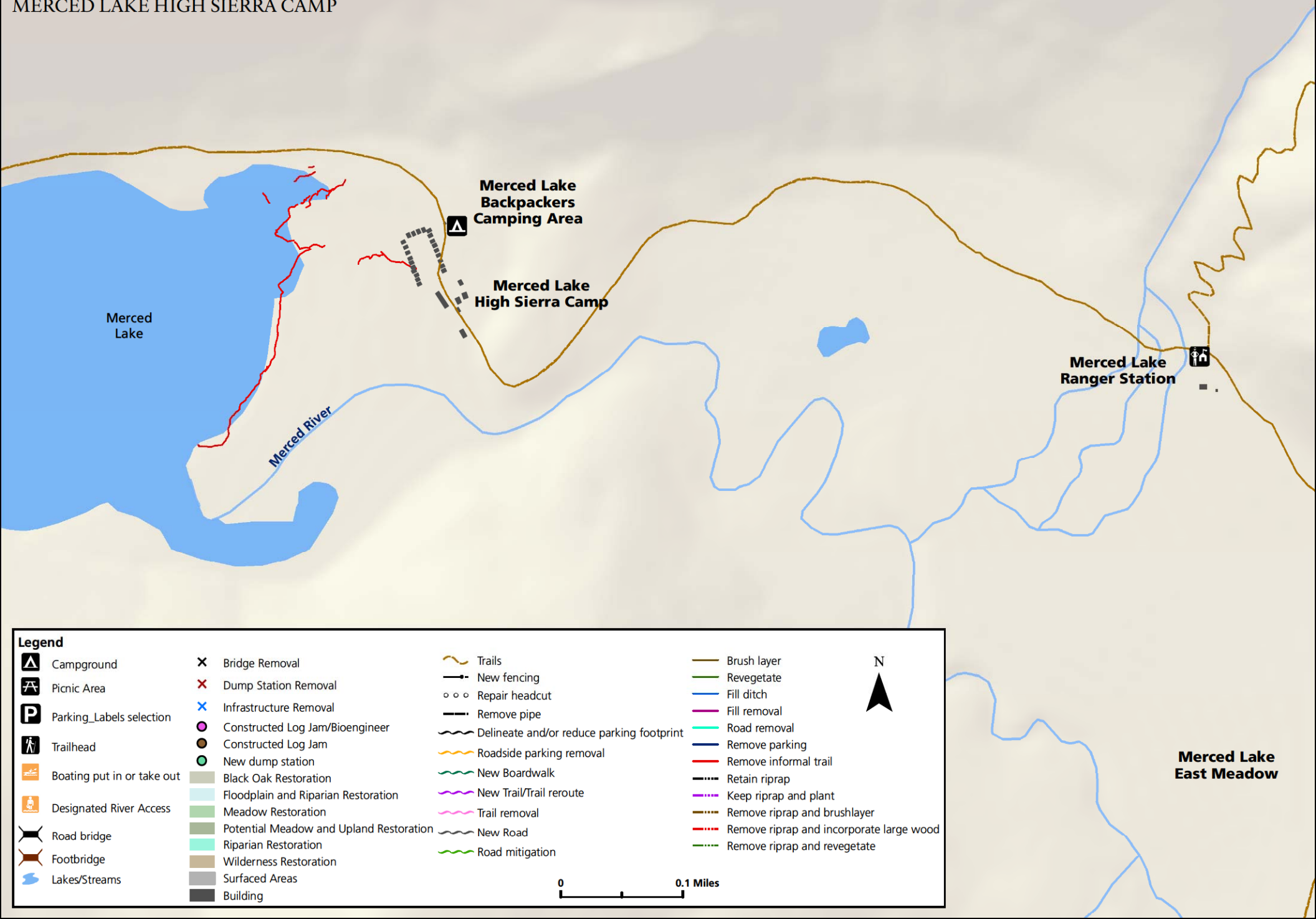
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### ALTERNATIVE 5 MERCED LAKE HIGH SIERRA CAMP



#### Legend

Campground	Bridge Removal	Trails	Brush layer
Picnic Area	Dump Station Removal	New fencing	Revegetate
Parking_Labels selection	Infrastructure Removal	Repair headcut	Fill ditch
Trailhead	Constructed Log Jam/Bioengineer	Remove pipe	Fill removal
Boating put in or take out	Constructed Log Jam	Delineate and/or reduce parking footprint	Road removal
Designated River Access	New dump station	Roadside parking removal	Remove parking
Road bridge	Black Oak Restoration	New Boardwalk	Remove informal trail
Footbridge	Floodplain and Riparian Restoration	New Trail/Trail reroute	Retain riprap
Lakes/Streams	Meadow Restoration	Trail removal	Keep riprap and plant
	Potential Meadow and Upland Restoration	New Road	Remove riprap and brushlayer
	Riparian Restoration	Road mitigation	Remove riprap and incorporate large wood
	Wilderness Restoration		Remove riprap and revegetate
	Surfaced Areas		
	Building		

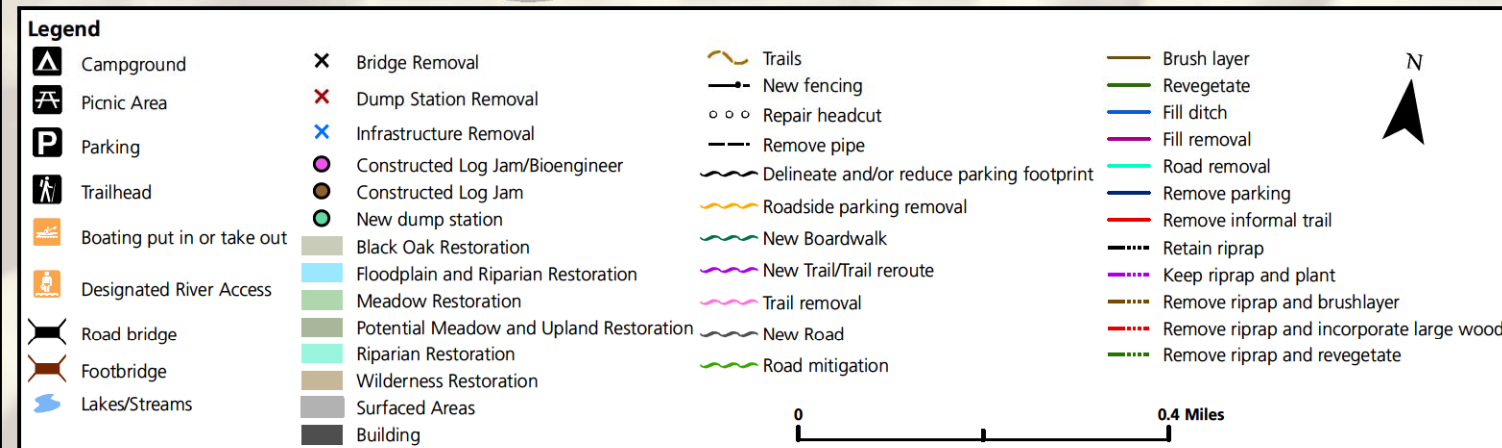
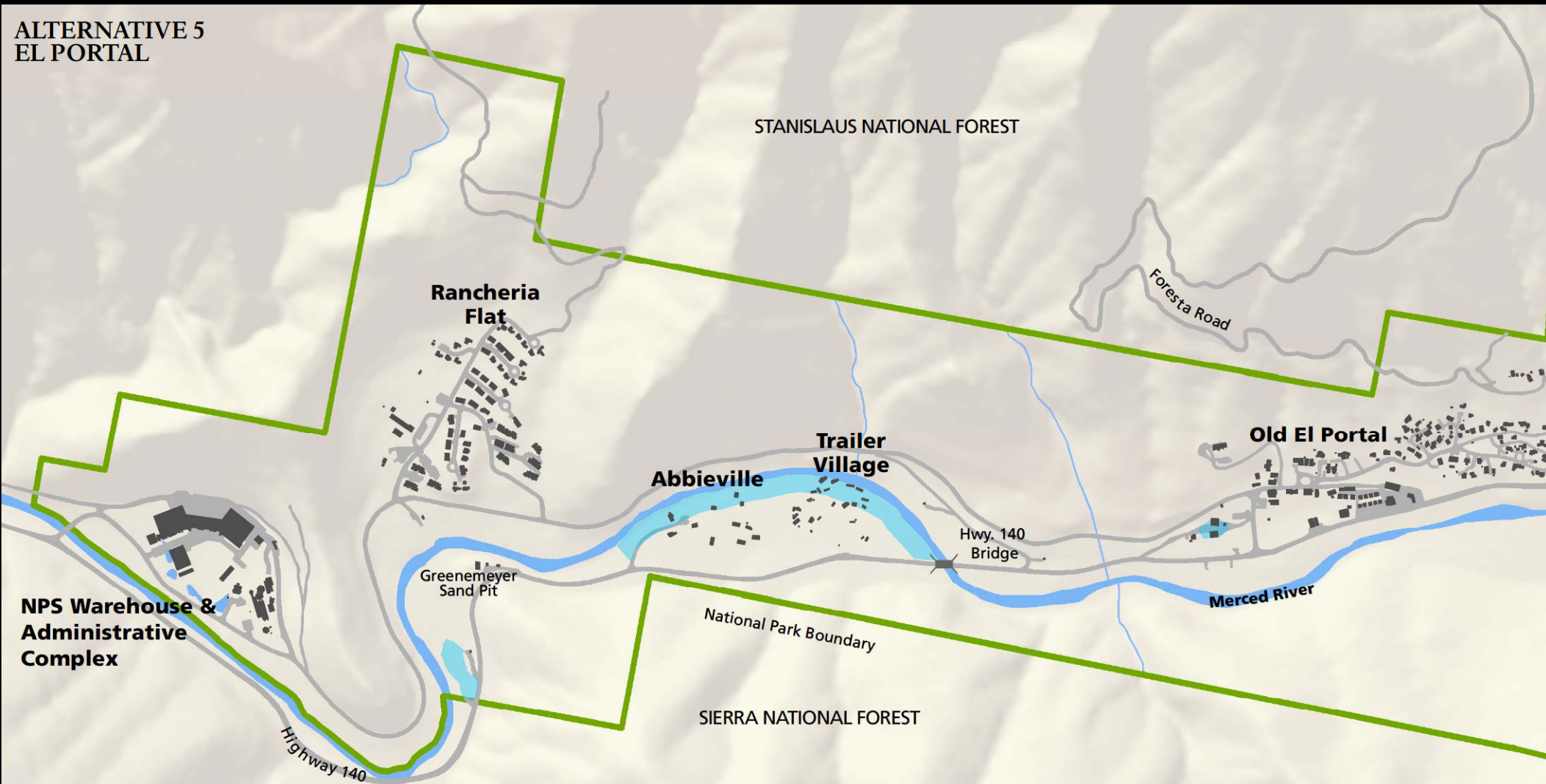
0 0.1 Miles



Merced Lake  
East Meadow



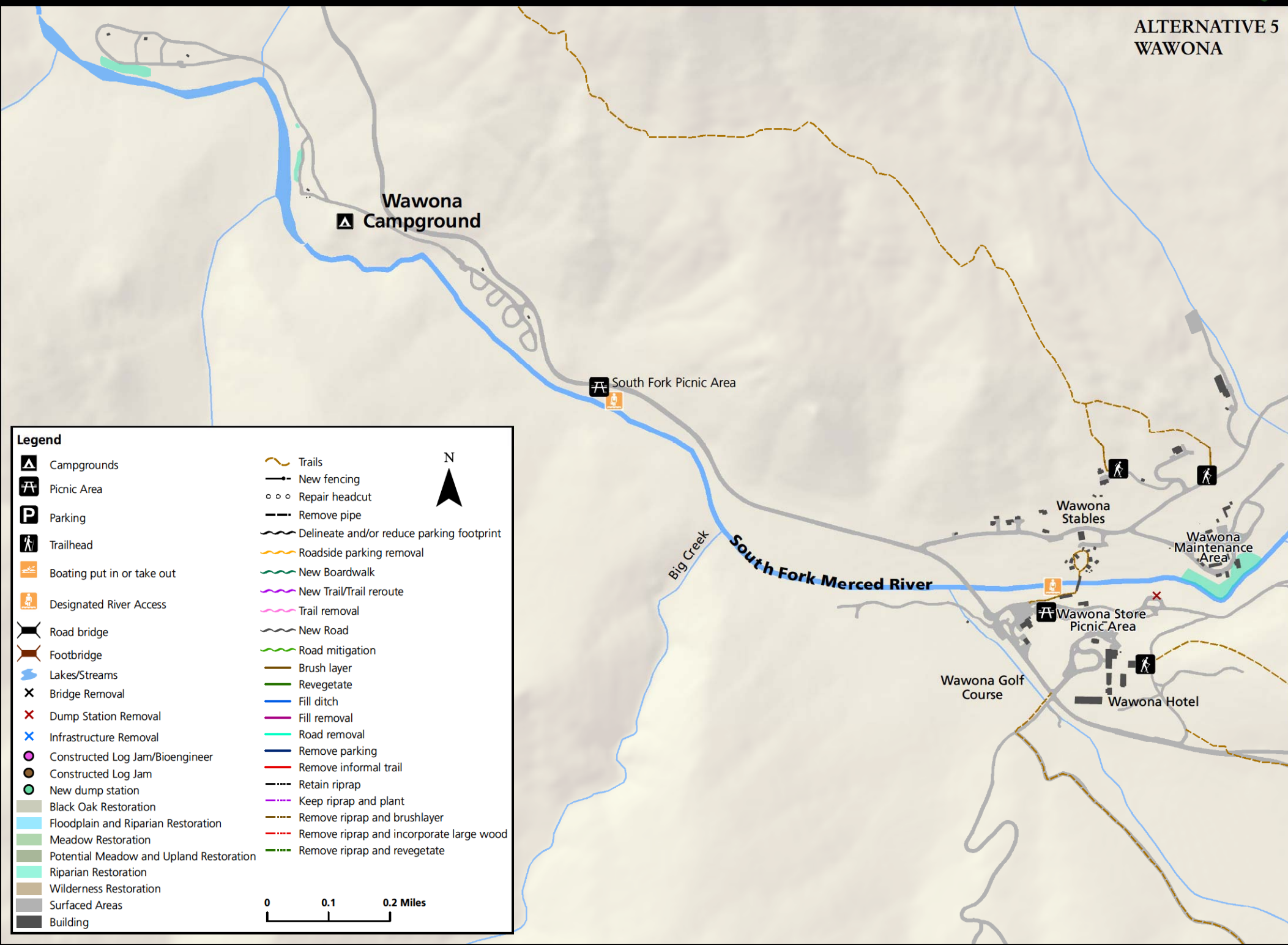
### ALTERNATIVE 5 EL PORTAL







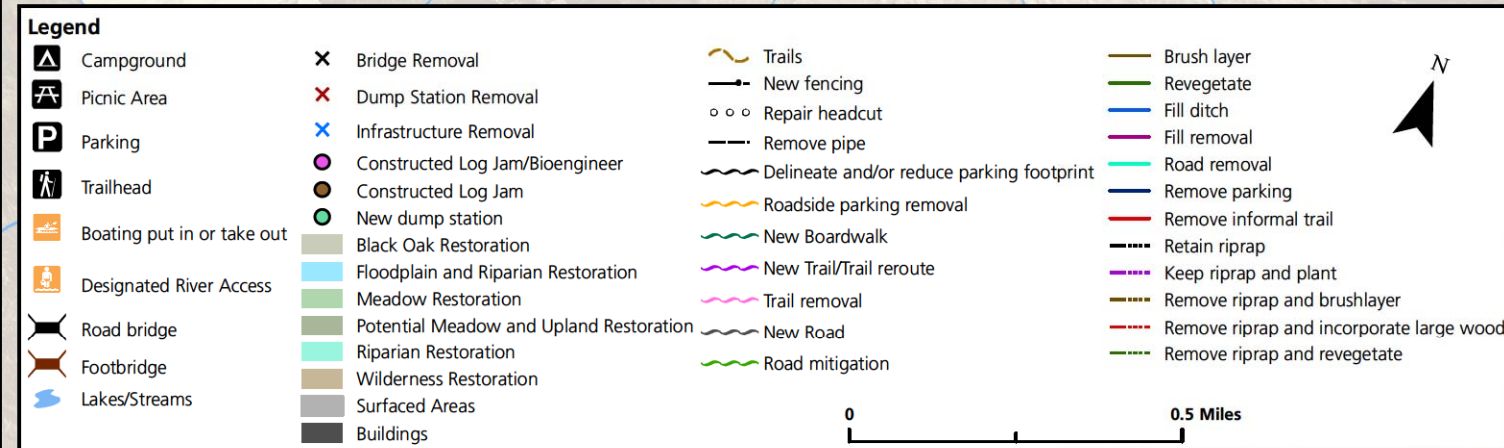
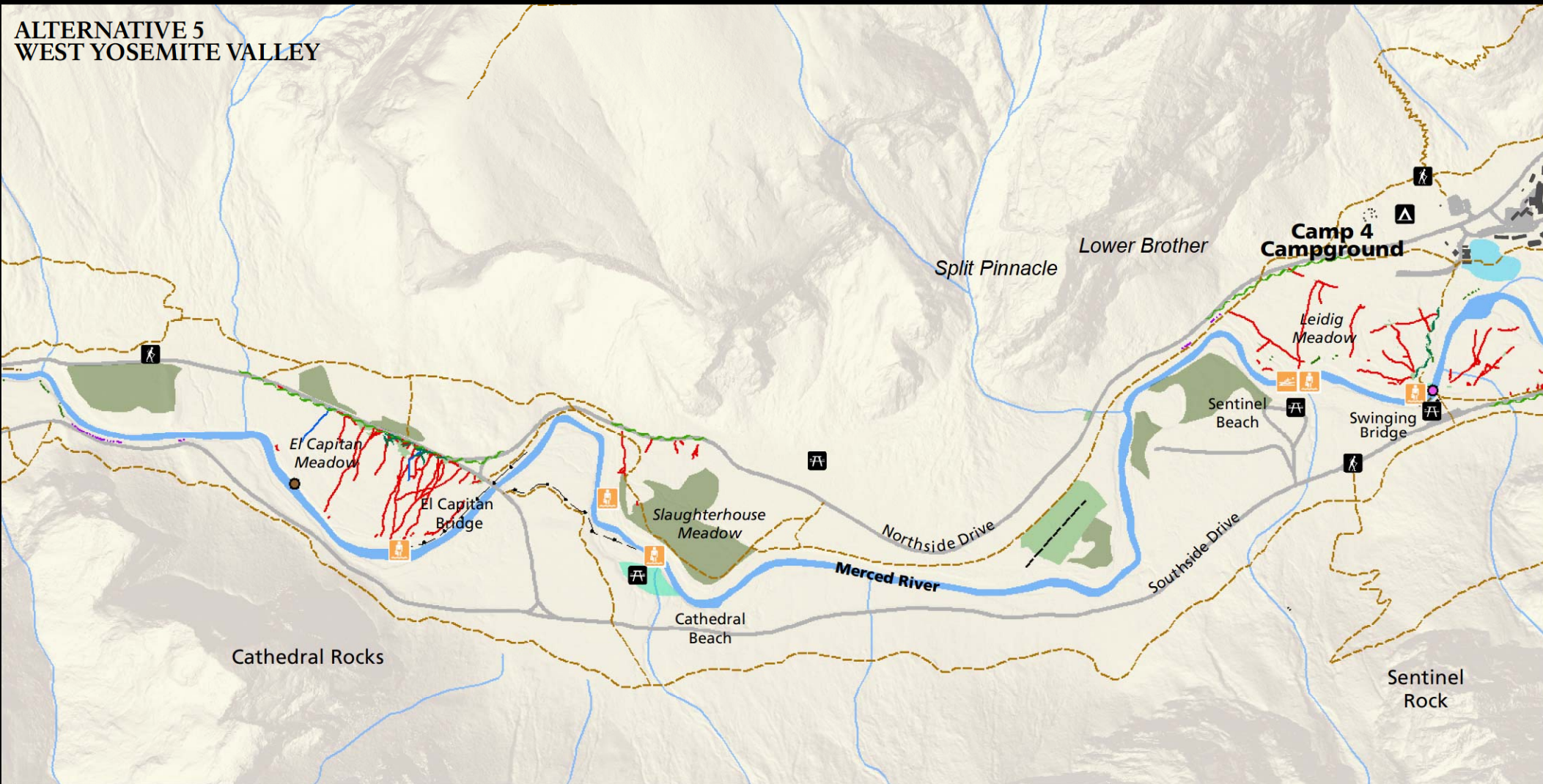
### ALTERNATIVE 5 WAWONA







### ALTERNATIVE 5 WEST YOSEMITE VALLEY



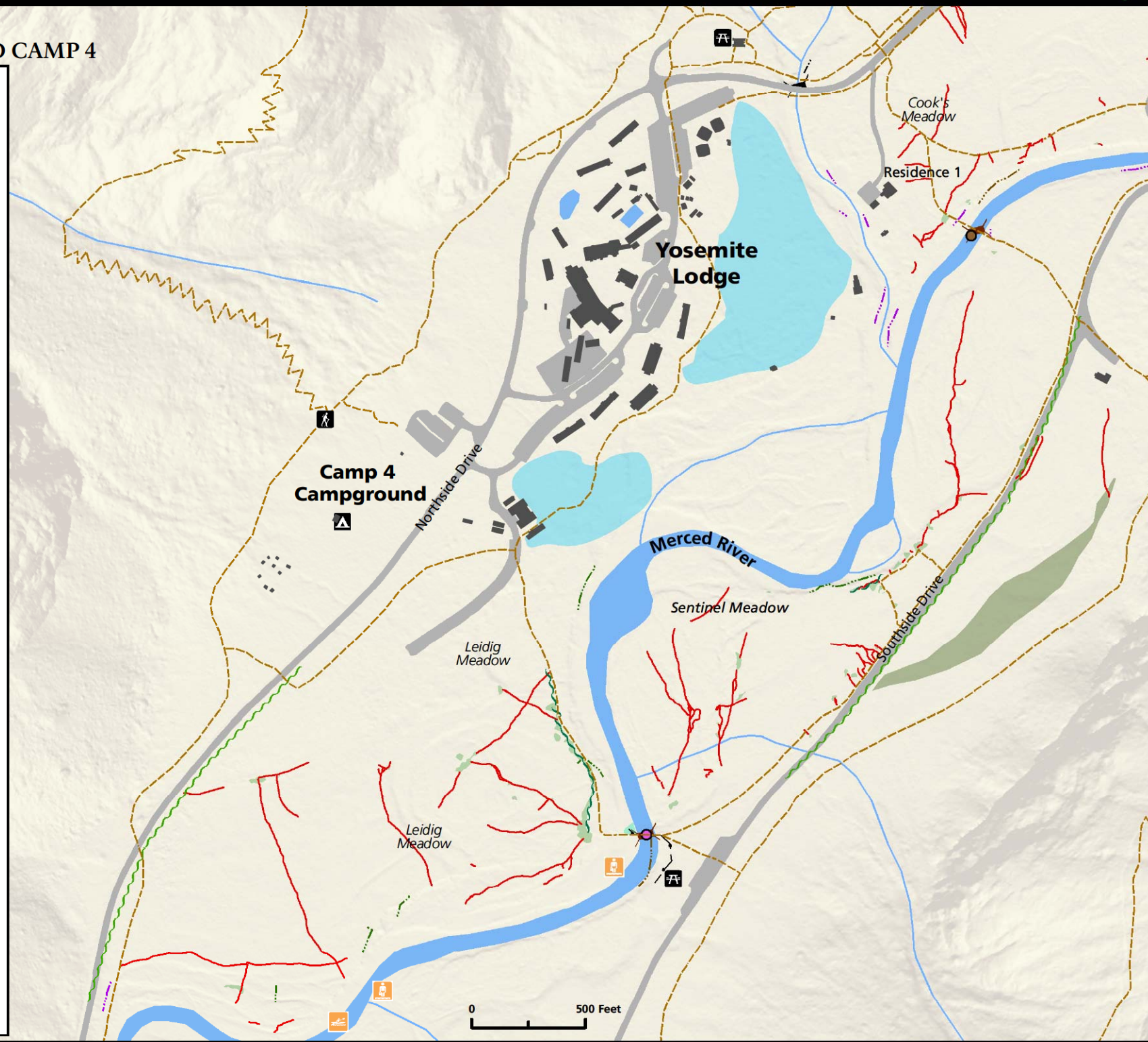




### ALTERNATIVE 5 YOSEMITE LODGE AND CAMP 4

#### Legend

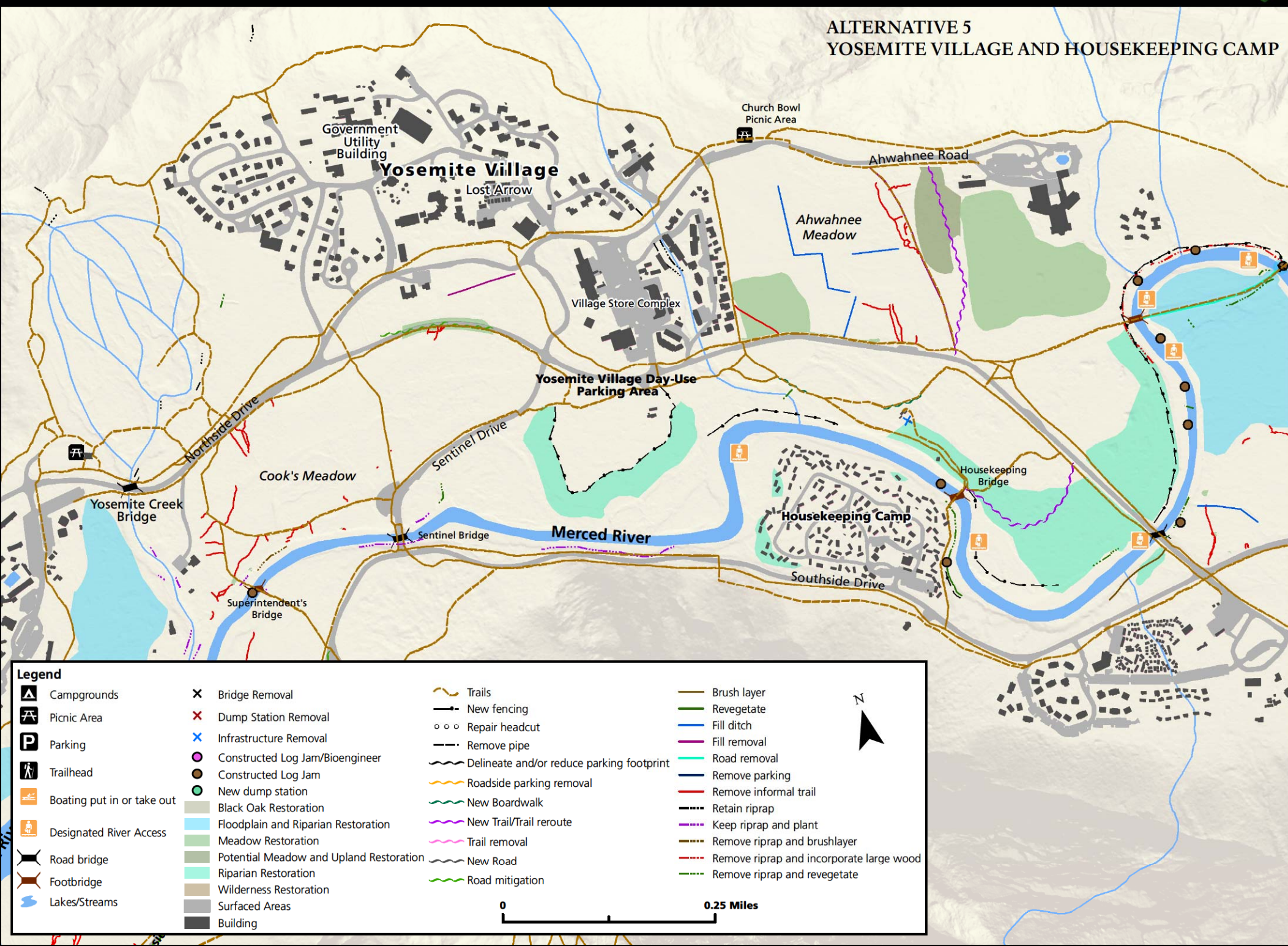
- Campground
- Picnic Area
- Parking
- Trailhead
- Boating put in or take out
- Designated River Access
- Road bridge
- Footbridge
- Lakes/Streams
- Bridge Removal
- Dump Station Removal
- Infrastructure Removal
- Constructed Log Jam/Bioengineer
- Constructed Log Jam
- New dump station
- Black Oak Restoration
- Floodplain and Riparian Restoration
- Meadow Restoration
- Potential Meadow and Upland Restoration
- Riparian Restoration
- Wilderness Restoration
- Surfaced Areas
- Buildings
- Trails
- New fencing
- Repair headcut
- Remove pipe
- Delineate and/or reduce parking footprint
- Roadside parking removal
- New Boardwalk
- New Trail/Trail reroute
- Trail removal
- New Road
- Road mitigation
- Brush layer
- Revegetate
- Fill ditch
- Fill removal
- Road removal
- Remove parking
- Remove informal trail
- Retain riprap
- Keep riprap and plant
- Remove riprap and brushlayer
- Remove riprap and incorporate large wood
- Remove riprap and revegetate







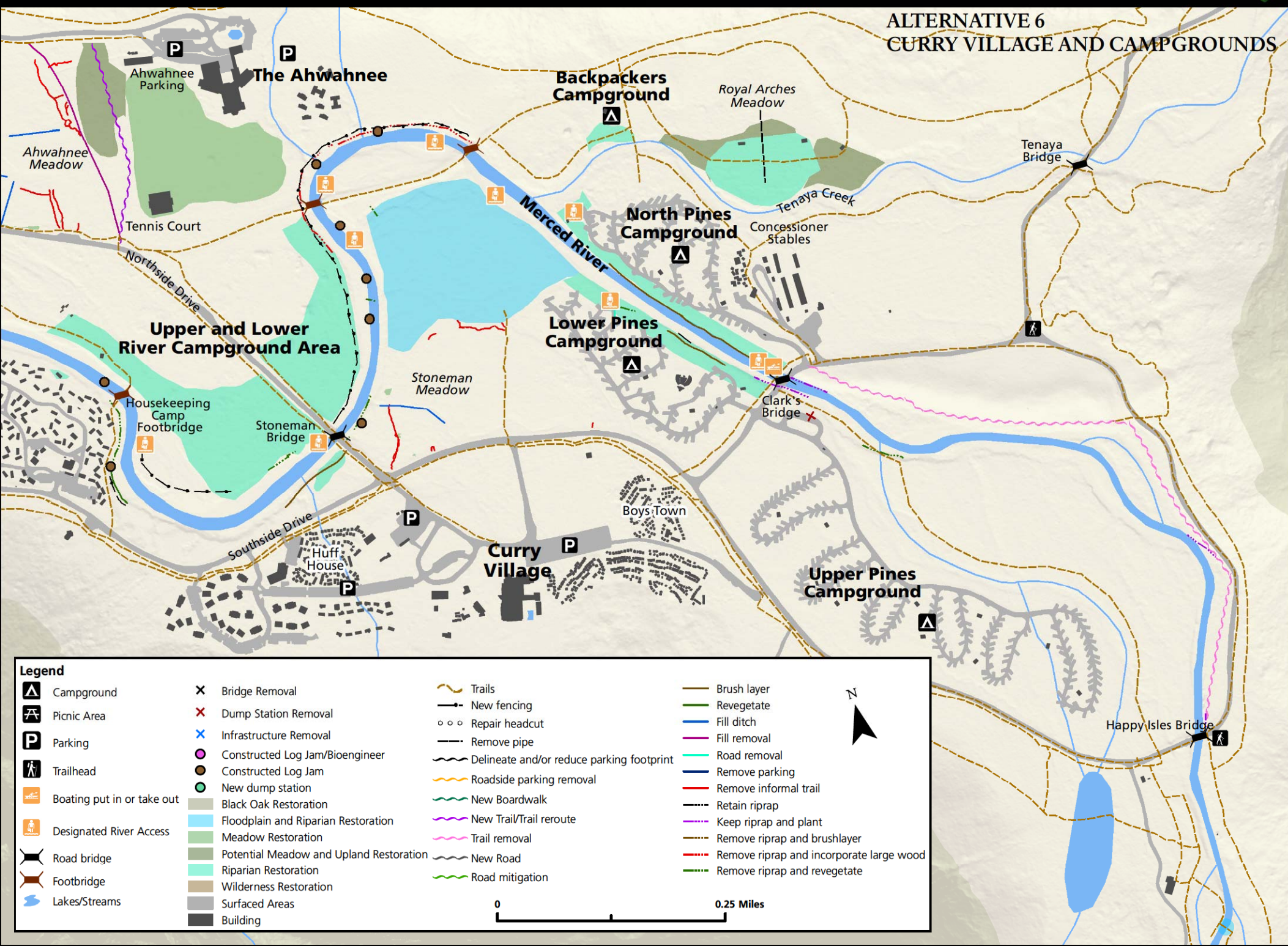
### ALTERNATIVE 5 YOSEMITE VILLAGE AND HOUSEKEEPING CAMP







### ALTERNATIVE 6 CURRY VILLAGE AND CAMPGROUNDS



#### Legend

Campground	Bridge Removal	Trails	Brush layer
Picnic Area	Dump Station Removal	New fencing	Revegetate
Parking	Infrastructure Removal	Repair headcut	Fill ditch
Trailhead	Constructed Log Jam/Bioengineer	Remove pipe	Fill removal
Boating put in or take out	Constructed Log Jam	Delineate and/or reduce parking footprint	Road removal
Designated River Access	New dump station	Roadside parking removal	Remove parking
Road bridge	Black Oak Restoration	New Boardwalk	Remove informal trail
Footbridge	Floodplain and Riparian Restoration	New Trail/Trail reroute	Retain riprap
Lakes/Streams	Meadow Restoration	Trail removal	Keep riprap and plant
	Potential Meadow and Upland Restoration	New Road	Remove riprap and brushlayer
	Riparian Restoration	Road mitigation	Remove riprap and incorporate large wood
	Wilderness Restoration		Remove riprap and revegetate
	Surfaced Areas		
	Building		

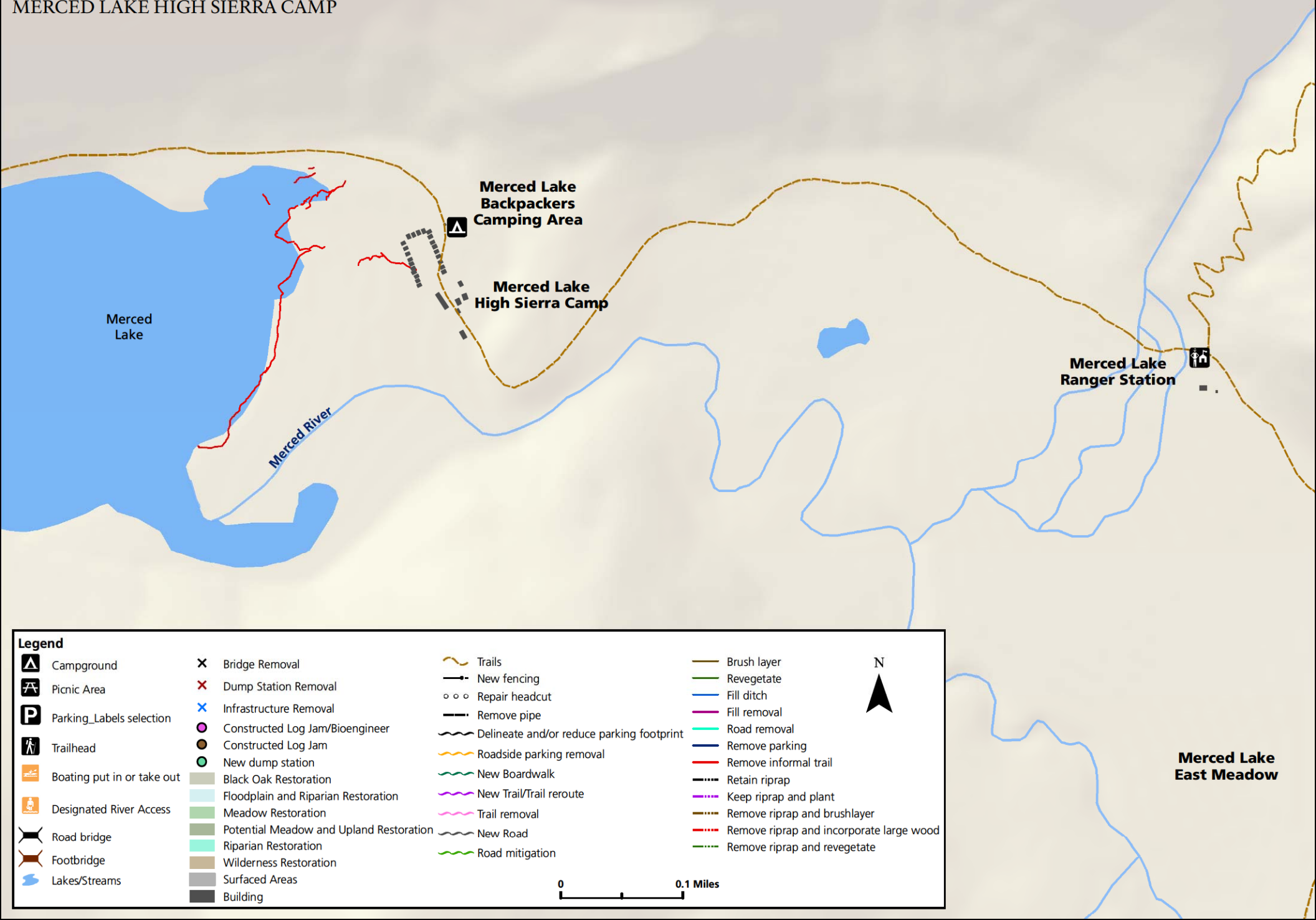
0 0.25 Miles







### ALTERNATIVE 6 MERCED LAKE HIGH SIERRA CAMP



#### Legend

Campground	Bridge Removal	Trails	Brush layer
Picnic Area	Dump Station Removal	New fencing	Revegetate
Parking_Labels selection	Infrastructure Removal	Repair headcut	Fill ditch
Trailhead	Constructed Log Jam/Bioengineer	Remove pipe	Fill removal
Boating put in or take out	Constructed Log Jam	Delineate and/or reduce parking footprint	Road removal
Designated River Access	New dump station	Roadside parking removal	Remove parking
Road bridge	Black Oak Restoration	New Boardwalk	Remove informal trail
Footbridge	Floodplain and Riparian Restoration	New Trail/Trail reroute	Retain riprap
Lakes/Streams	Meadow Restoration	Trail removal	Keep riprap and plant
	Potential Meadow and Upland Restoration	New Road	Remove riprap and brushlayer
	Riparian Restoration	Road mitigation	Remove riprap and incorporate large wood
	Wilderness Restoration		Remove riprap and revegetate
	Surfaced Areas		
	Building		

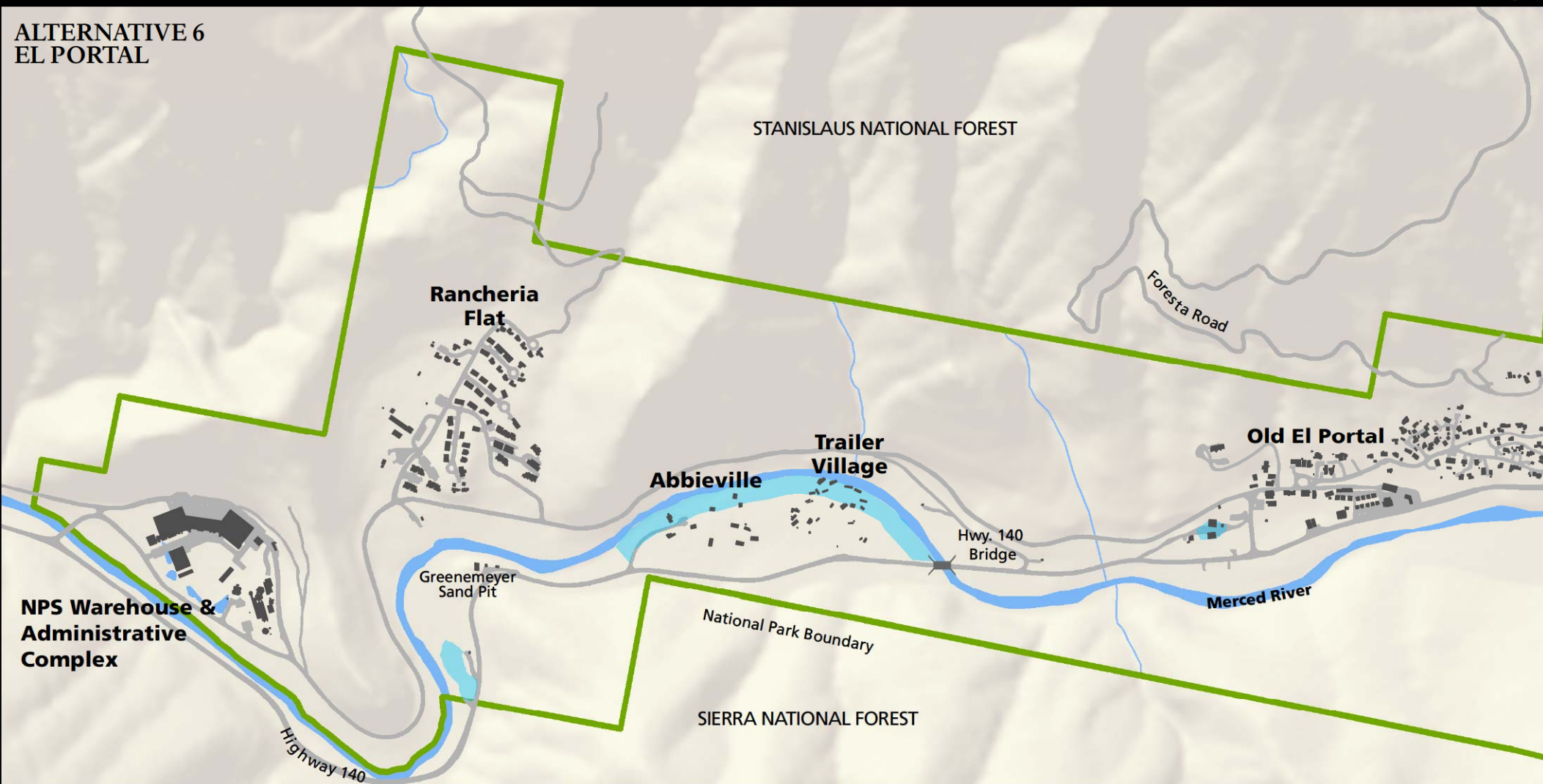
0 0.1 Miles



Merced Lake  
East Meadow



### ALTERNATIVE 6 EL PORTAL



#### Legend

	Campground		Bridge Removal		Trails		Brush layer
	Picnic Area		Dump Station Removal		New fencing		Revegetate
	Parking		Infrastructure Removal		Repair headcut		Fill ditch
	Trailhead		Constructed Log Jam/Bioengineer		Remove pipe		Fill removal
	Boating put in or take out		Constructed Log Jam		Delineate and/or reduce parking footprint		Road removal
	Designated River Access		New dump station		Roadside parking removal		Remove parking
	Road bridge		Black Oak Restoration		New Boardwalk		Remove informal trail
	Footbridge		Floodplain and Riparian Restoration		New Trail/Trail reroute		Retain riprap
	Lakes/Streams		Meadow Restoration		Trail removal		Keep riprap and plant
			Potential Meadow and Upland Restoration		New Road		Remove riprap and brushlayer
			Riparian Restoration		Road mitigation		Remove riprap and incorporate large wood
			Wilderness Restoration				Remove riprap and revegetate
			Surfaced Areas				
			Building				

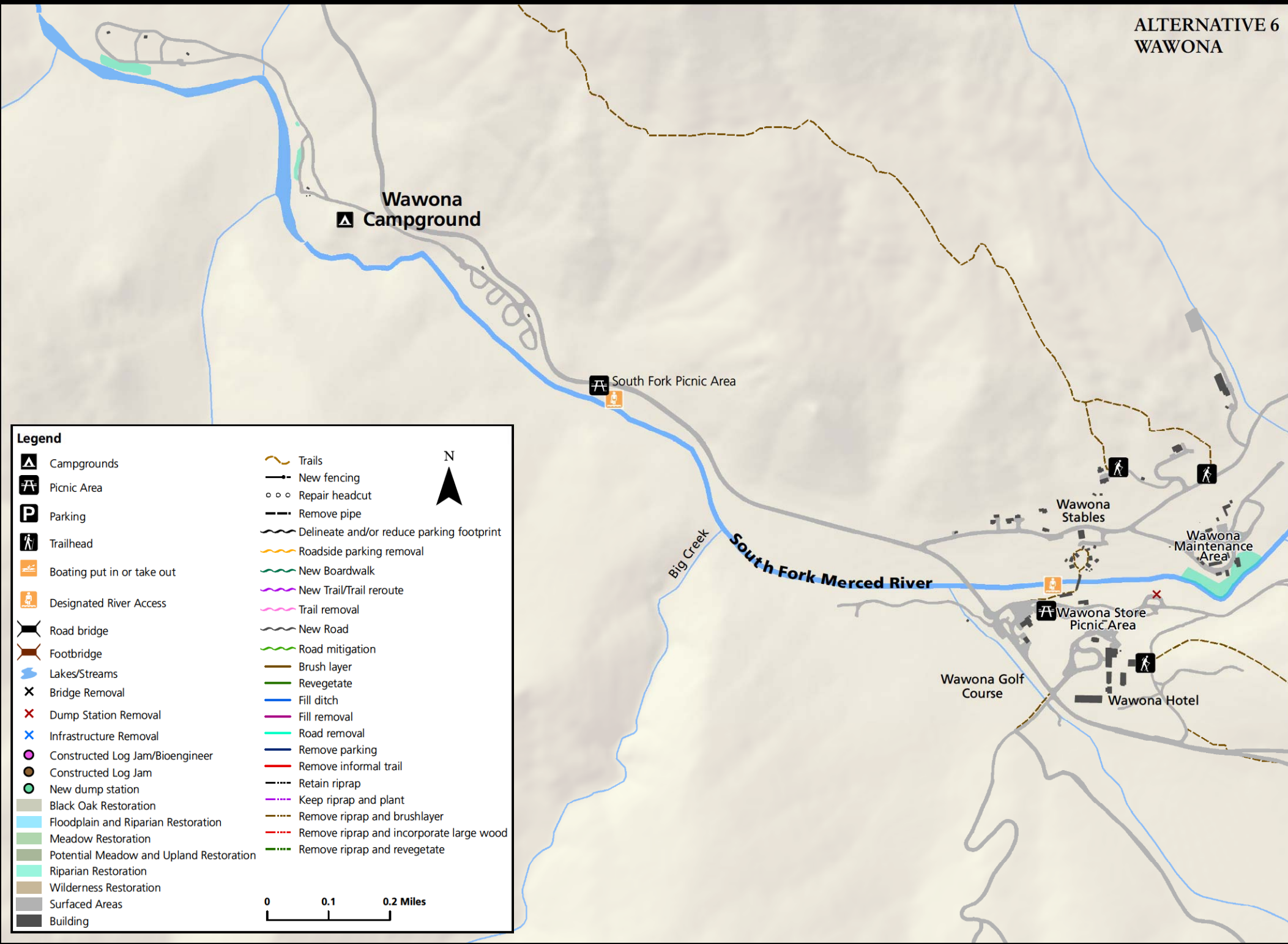


0 0.4 Miles





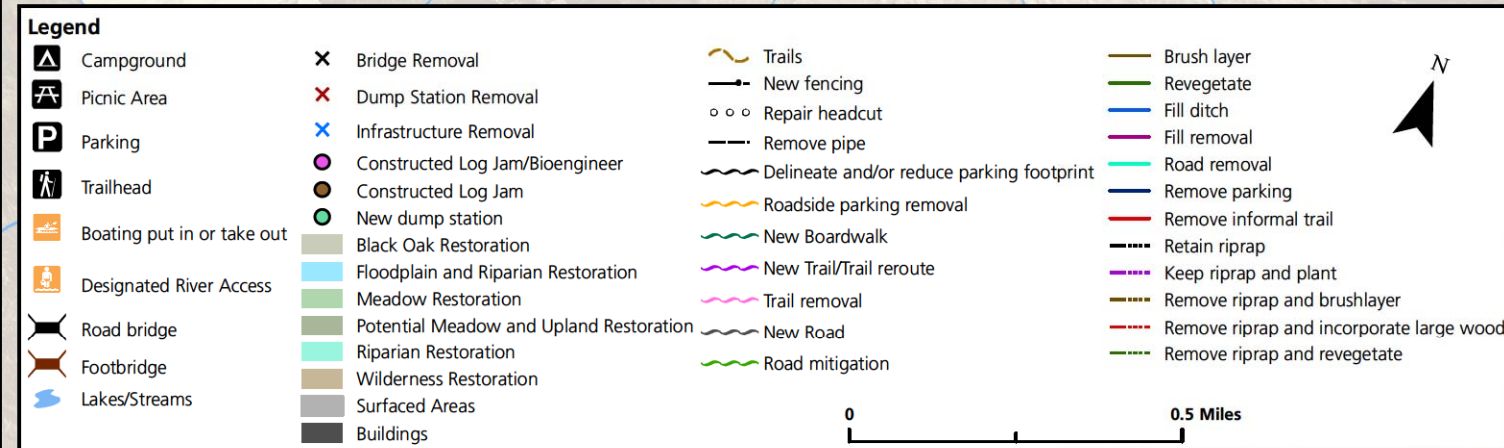
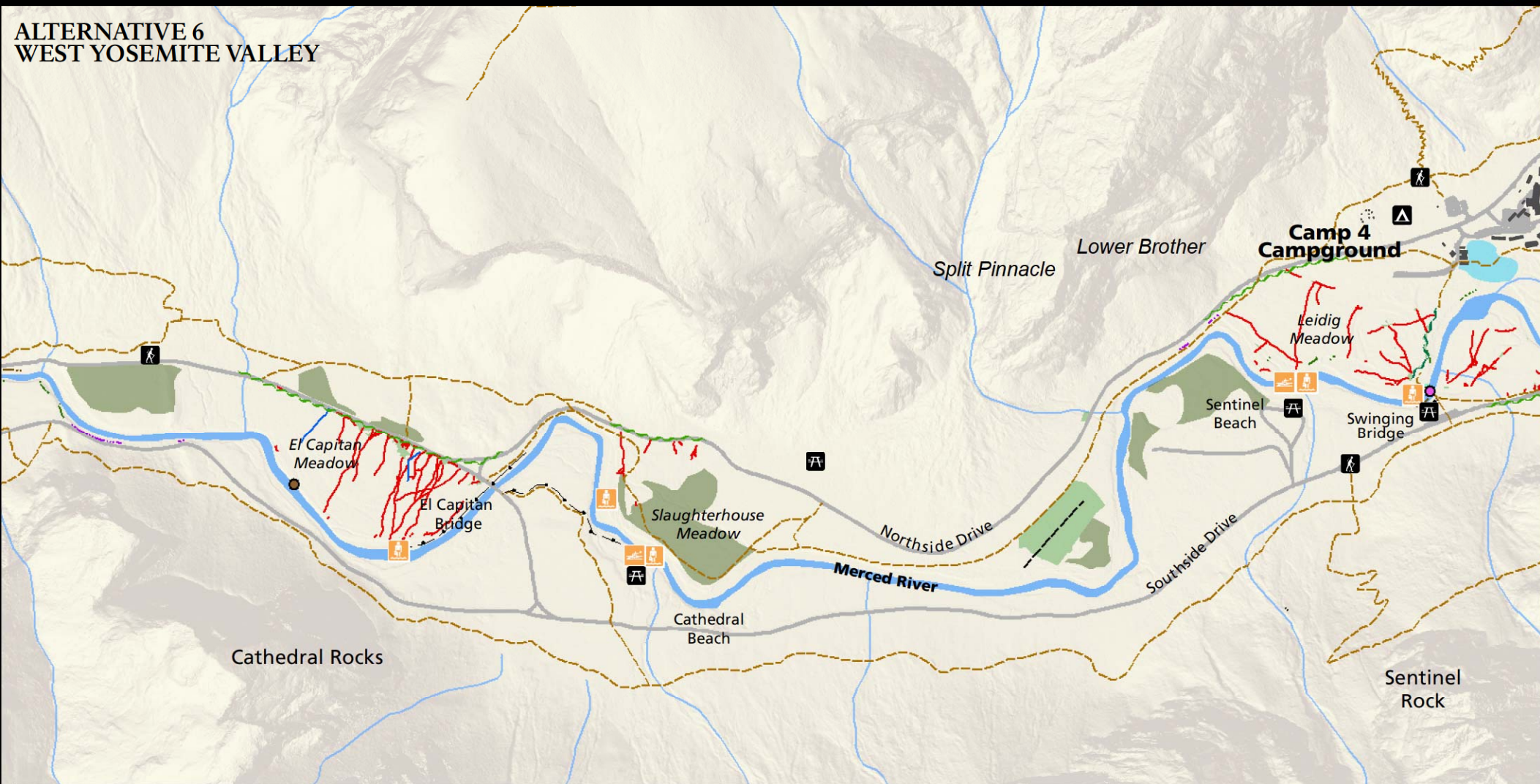
### ALTERNATIVE 6 WAWONA







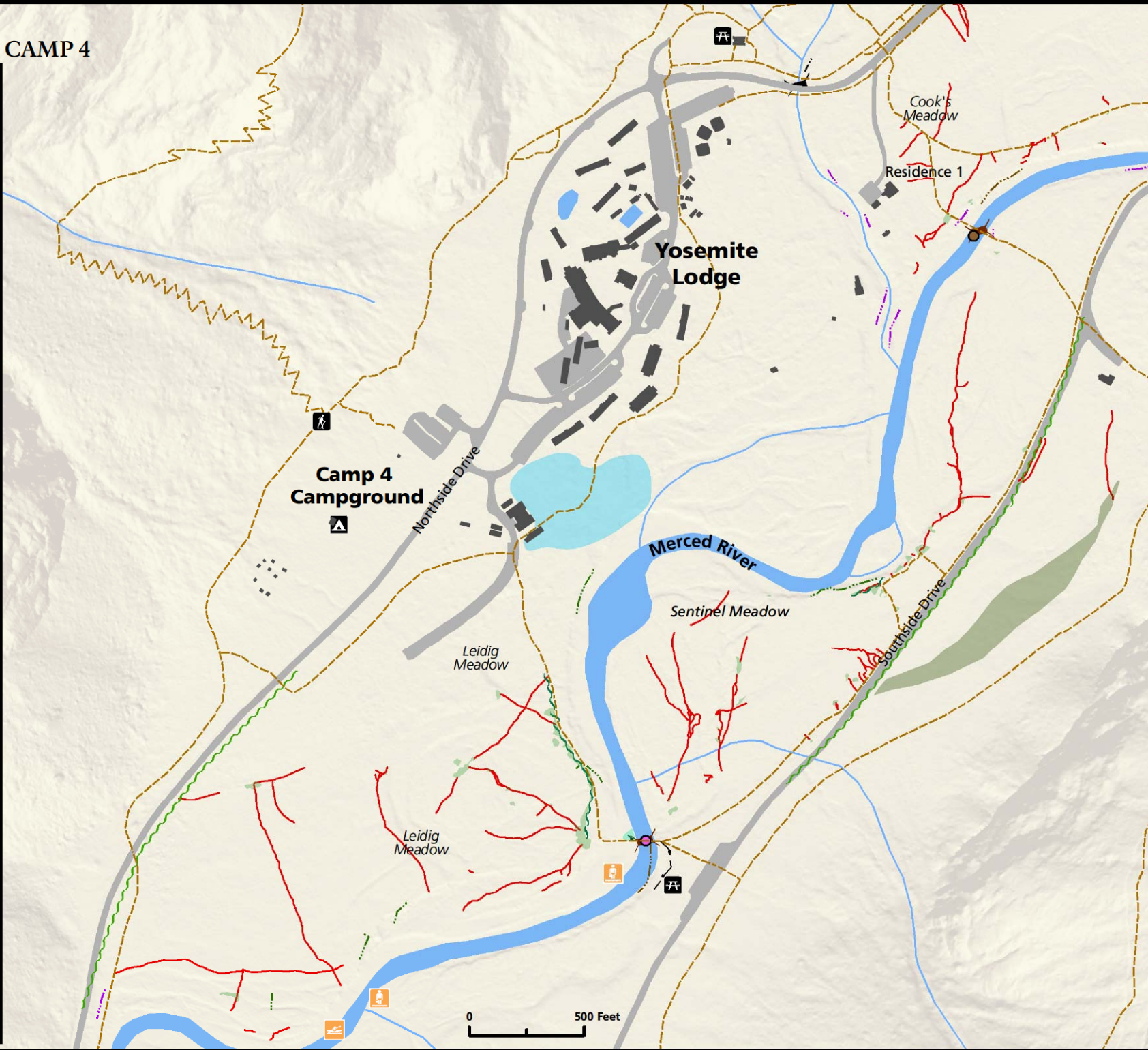
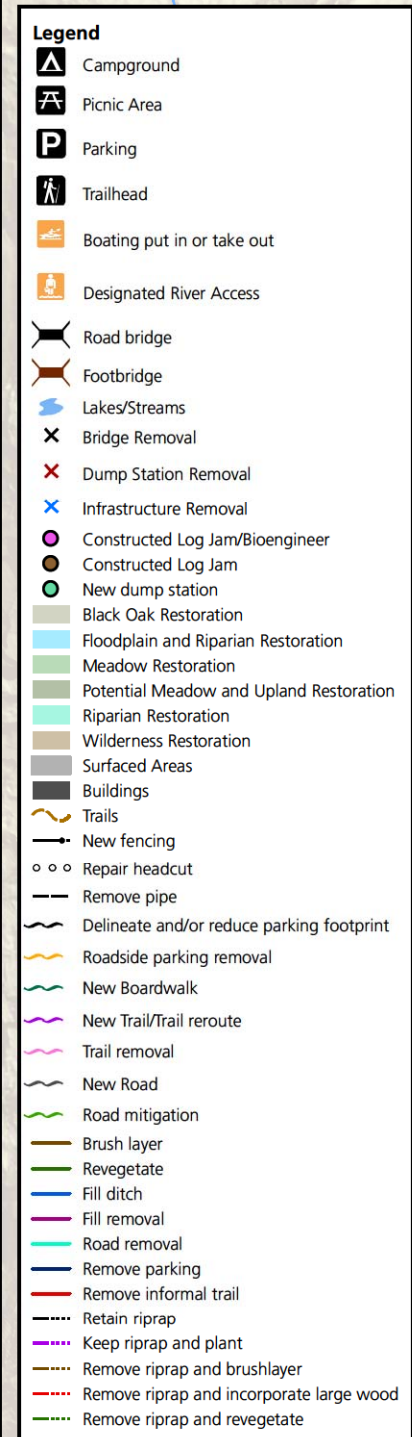
### ALTERNATIVE 6 WEST YOSEMITE VALLEY







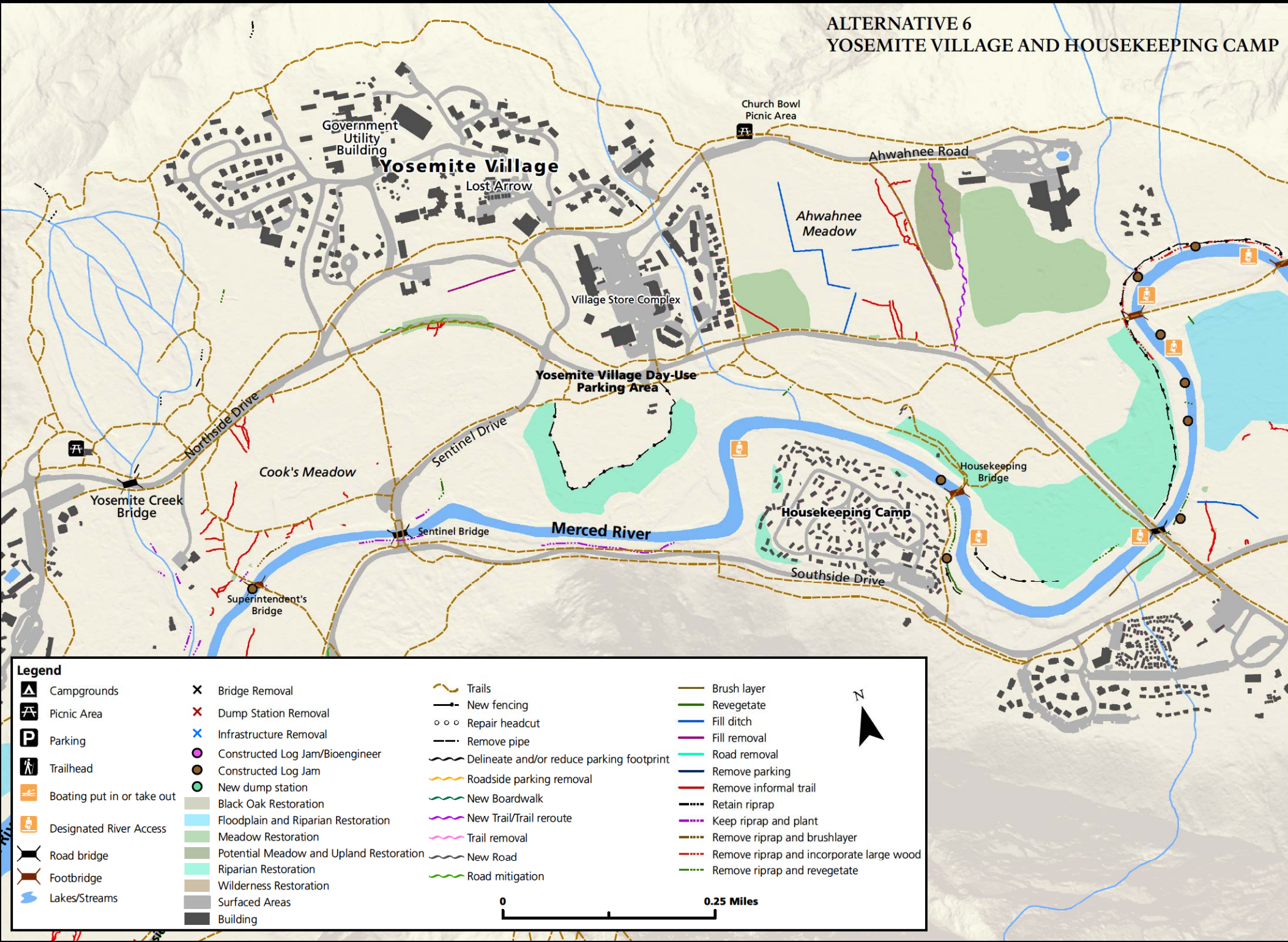
### ALTERNATIVE 6 YOSEMITE LODGE AND CAMP 4







### ALTERNATIVE 6 YOSEMITE VILLAGE AND HOUSEKEEPING CAMP



#### Legend

	Campgrounds		Bridge Removal		Trails		Brush layer
	Picnic Area		Dump Station Removal		New fencing		Revegetate
	Parking		Infrastructure Removal		Repair headcut		Fill ditch
	Trailhead		Constructed Log Jam/Bioengineer		Remove pipe		Fill removal
	Boating put in or take out		Constructed Log Jam		Delineate and/or reduce parking footprint		Road removal
	Designated River Access		New dump station		Roadside parking removal		Remove parking
	Road bridge		Black Oak Restoration		New Boardwalk		Remove informal trail
	Footbridge		Floodplain and Riparian Restoration		New Trail/Trail reroute		Retain riprap
	Lakes/Streams		Meadow Restoration		Trail removal		Keep riprap and plant
			Potential Meadow and Upland Restoration		New Road		Remove riprap and brushlayer
			Riparian Restoration		Road mitigation		Remove riprap and incorporate large wood
			Wilderness Restoration				Remove riprap and revegetate
			Surfaced Areas				
			Building				

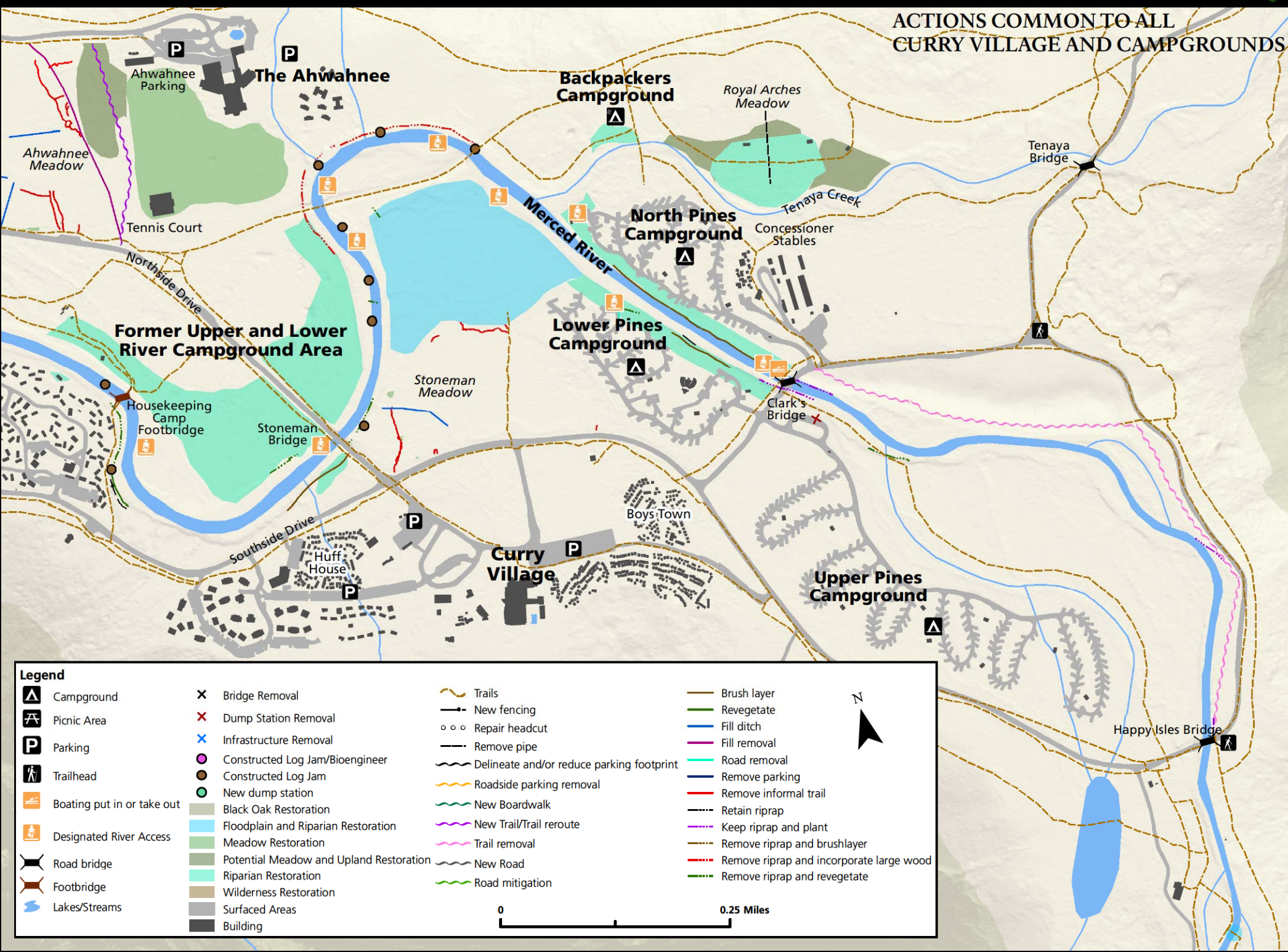
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### ACTIONS COMMON TO ALL CURRY VILLAGE AND CAMPGROUNDS



#### Legend

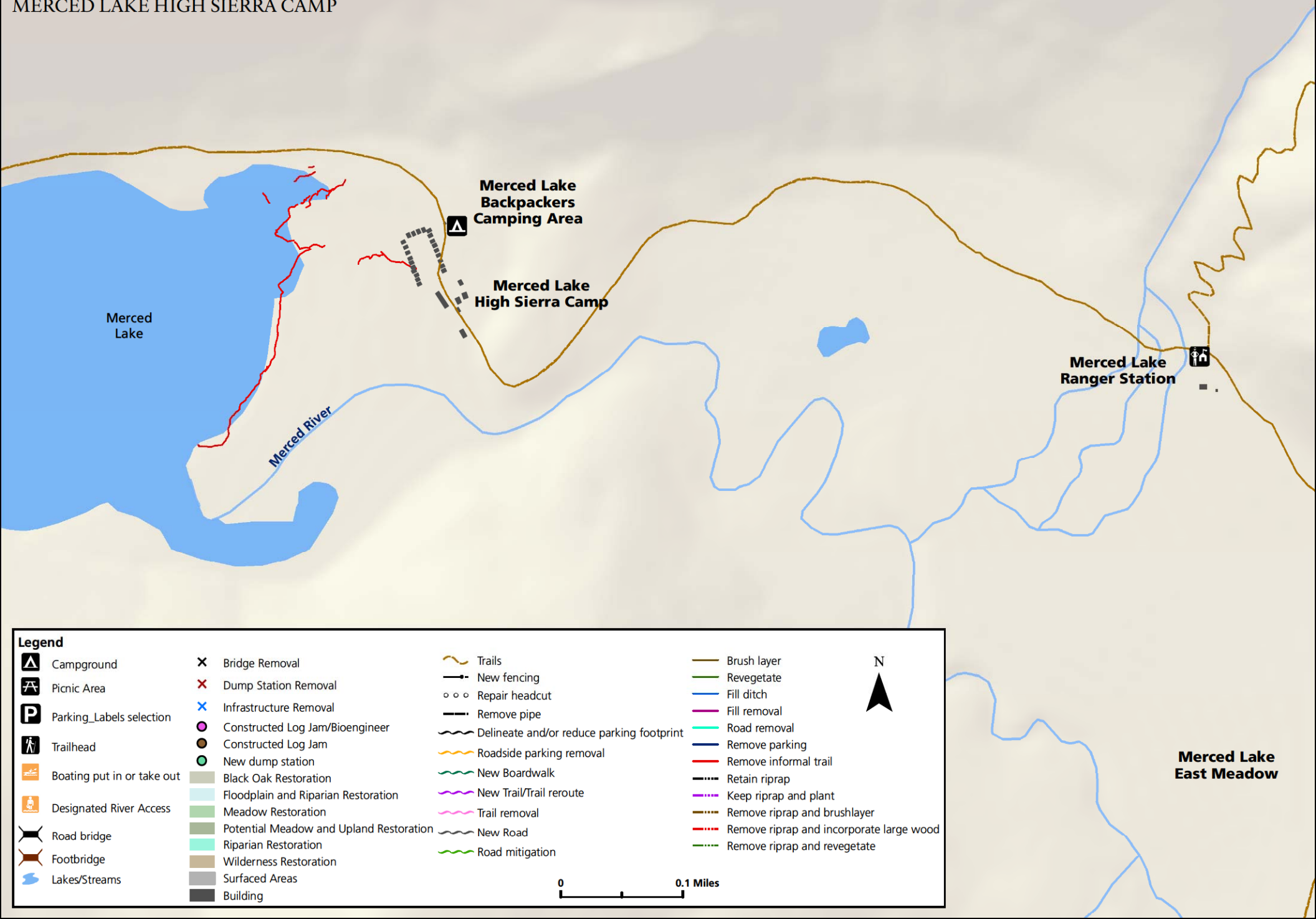
- |                            |   |   |  |
|----------------------------|---|---|--|
| Campground                 | Bridge Removal                          | Trails                                    | Brush layer                              |
| Picnic Area                | Dump Station Removal                    | New fencing                               | Revegetate                               |
| Parking                    | Infrastructure Removal                  | Repair headcut                            | Fill ditch                               |
| Trailhead                  | Constructed Log Jam/Bioengineer         | Remove pipe                               | Fill removal                             |
| Boating put in or take out | Constructed Log Jam                     | Delineate and/or reduce parking footprint | Road removal                             |
| Designated River Access    | New dump station                        | Roadside parking removal                  | Remove parking                           |
| Road bridge                | Black Oak Restoration                   | New Boardwalk                             | Remove informal trail                    |
| Footbridge                 | Floodplain and Riparian Restoration     | New Trail/Trail reroute                   | Retain riprap                            |
| Lakes/Streams              | Meadow Restoration                      | Trail removal                             | Keep riprap and plant                    |
|                            | Potential Meadow and Upland Restoration | New Road                                  | Remove riprap and brushlayer             |
|                            | Riparian Restoration                    | Road mitigation                           | Remove riprap and incorporate large wood |
|                            | Wilderness Restoration                  |   | Remove riprap and revegetate             |
|                            | Surfaced Areas                          |   |  |
|                            | Building                                |   |  |

0 0.25 Miles





### ACTIONS COMMON TO ALL MERCED LAKE HIGH SIERRA CAMP



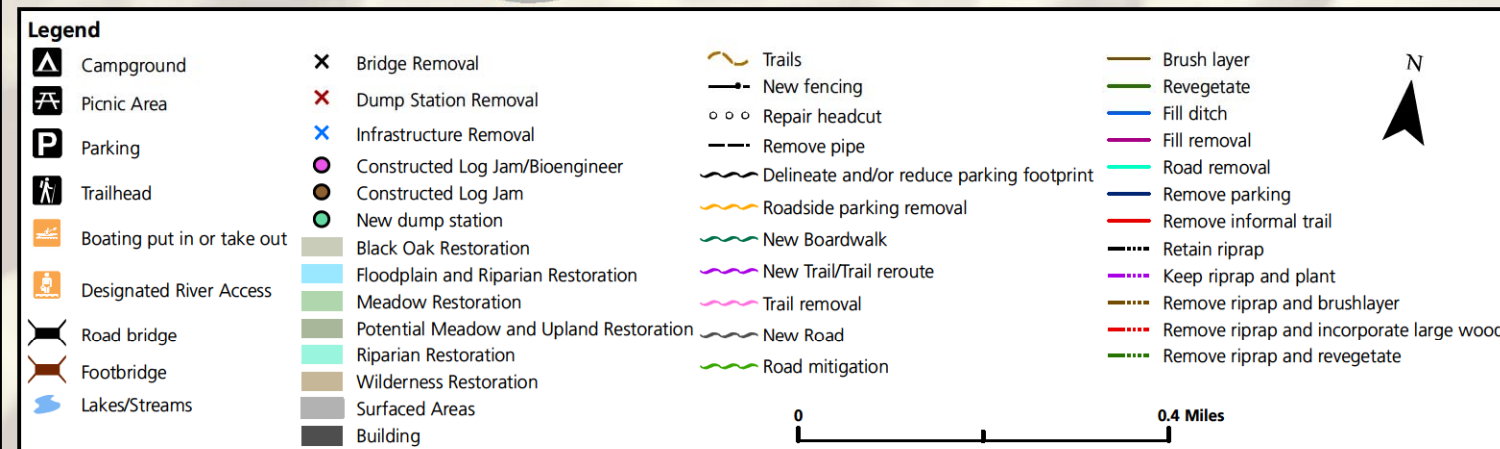
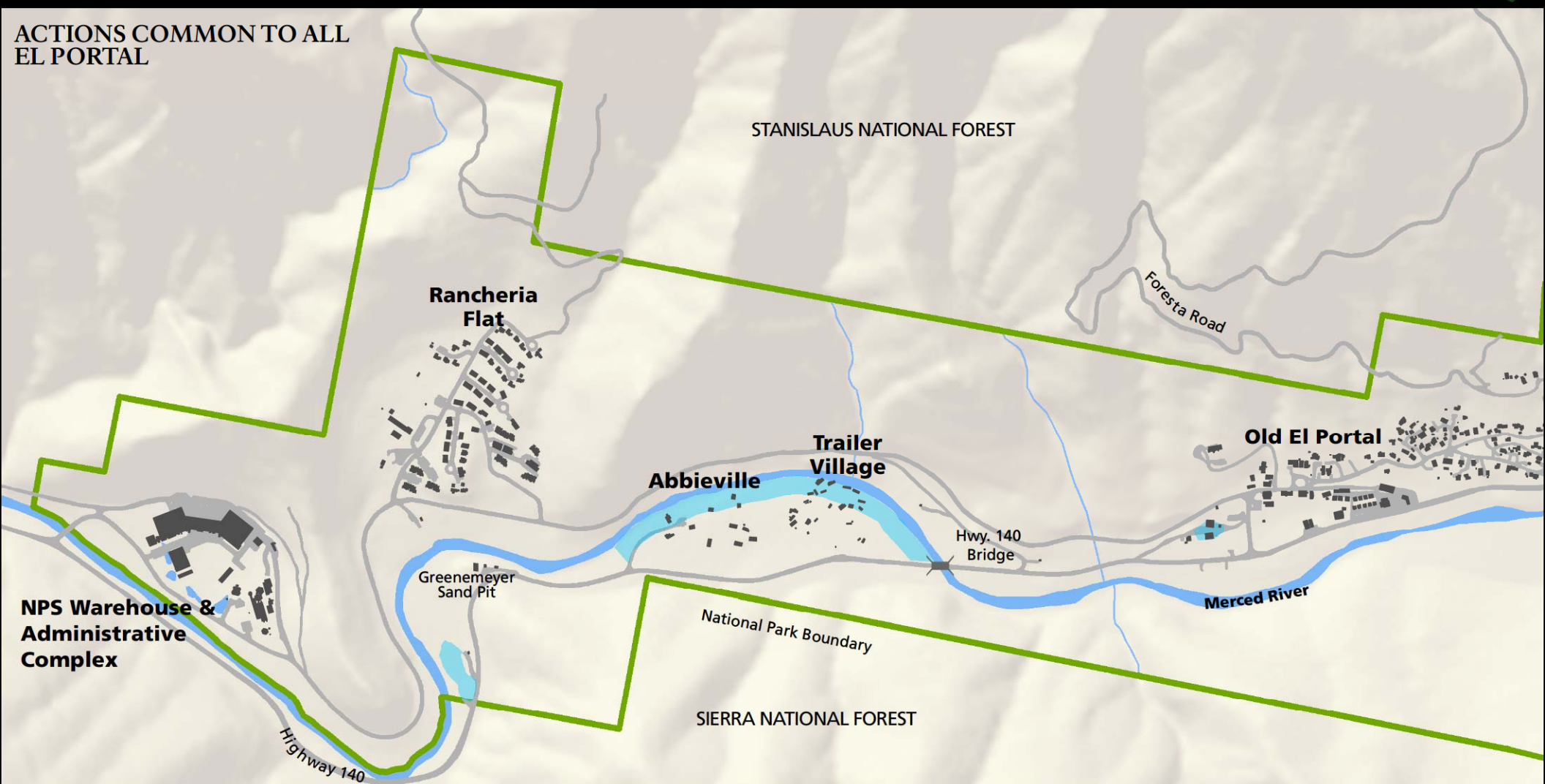
**Merced Lake  
East Meadow**

#### Legend

- |                            |   |   |  |
|----------------------------|---|---|--|
| Campground                 | Bridge Removal                          | Trails                                    | Brush layer                              |
| Picnic Area                | Dump Station Removal                    | New fencing                               | Revegetate                               |
| Parking_Labels selection   | Infrastructure Removal                  | Repair headcut                            | Fill ditch                               |
| Trailhead                  | Constructed Log Jam/Bioengineer         | Remove pipe                               | Fill removal                             |
| Boating put in or take out | Constructed Log Jam                     | Delineate and/or reduce parking footprint | Road removal                             |
| Designated River Access    | New dump station                        | Roadside parking removal                  | Remove parking                           |
| Road bridge                | Black Oak Restoration                   | New Boardwalk                             | Remove informal trail                    |
| Footbridge                 | Floodplain and Riparian Restoration     | New Trail/Trail reroute                   | Retain riprap                            |
| Lakes/Streams              | Meadow Restoration                      | Trail removal                             | Keep riprap and plant                    |
|                            | Potential Meadow and Upland Restoration | New Road                                  | Remove riprap and brushlayer             |
|                            | Riparian Restoration                    | Road mitigation                           | Remove riprap and incorporate large wood |
|                            | Wilderness Restoration                  |   | Remove riprap and revegetate             |
|                            | Surfaced Areas                          |   |  |
|                            | Building                                |   |  |

0 0.1 Miles

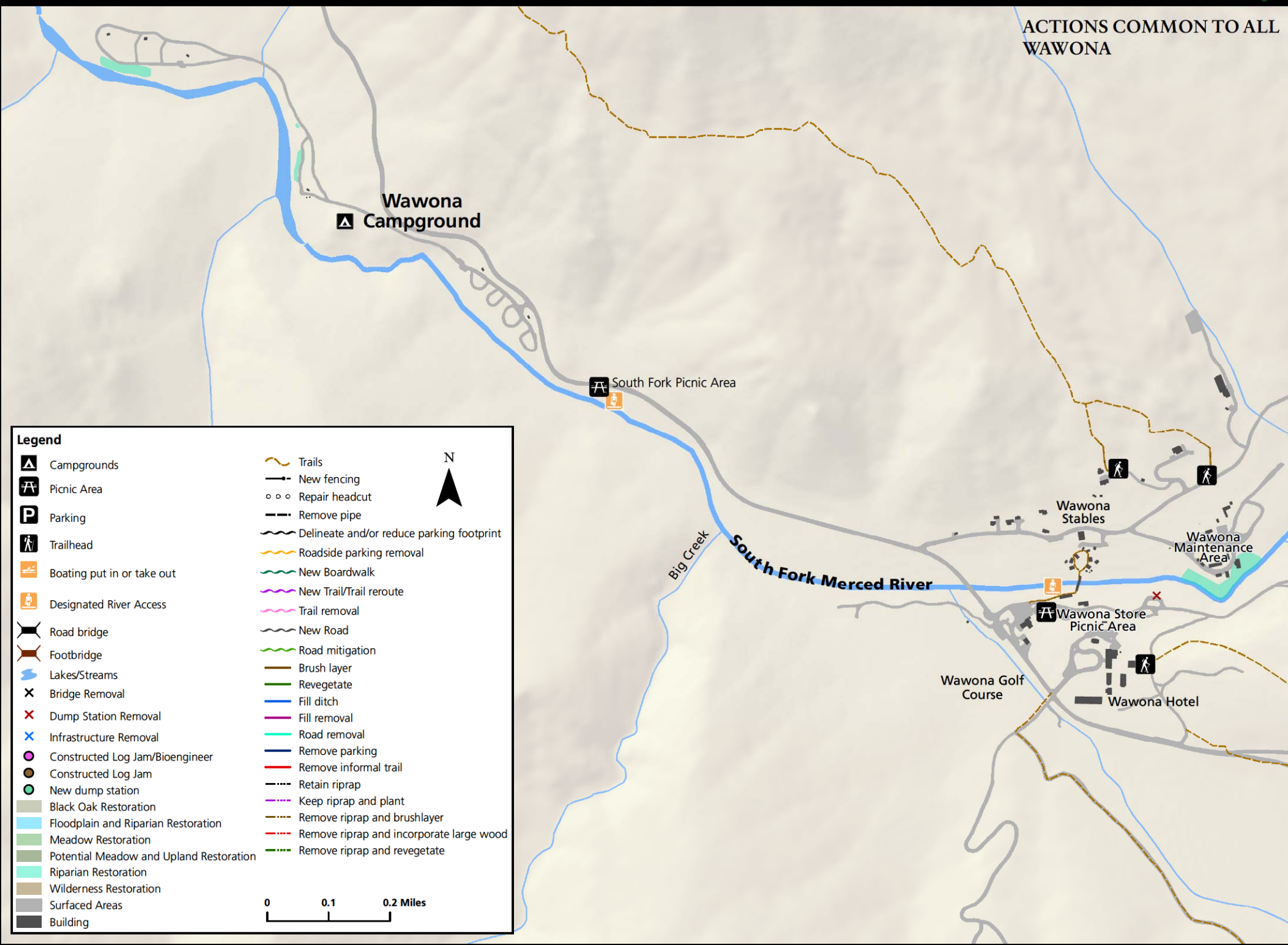








### ACTIONS COMMON TO ALL WAWONA



#### Legend

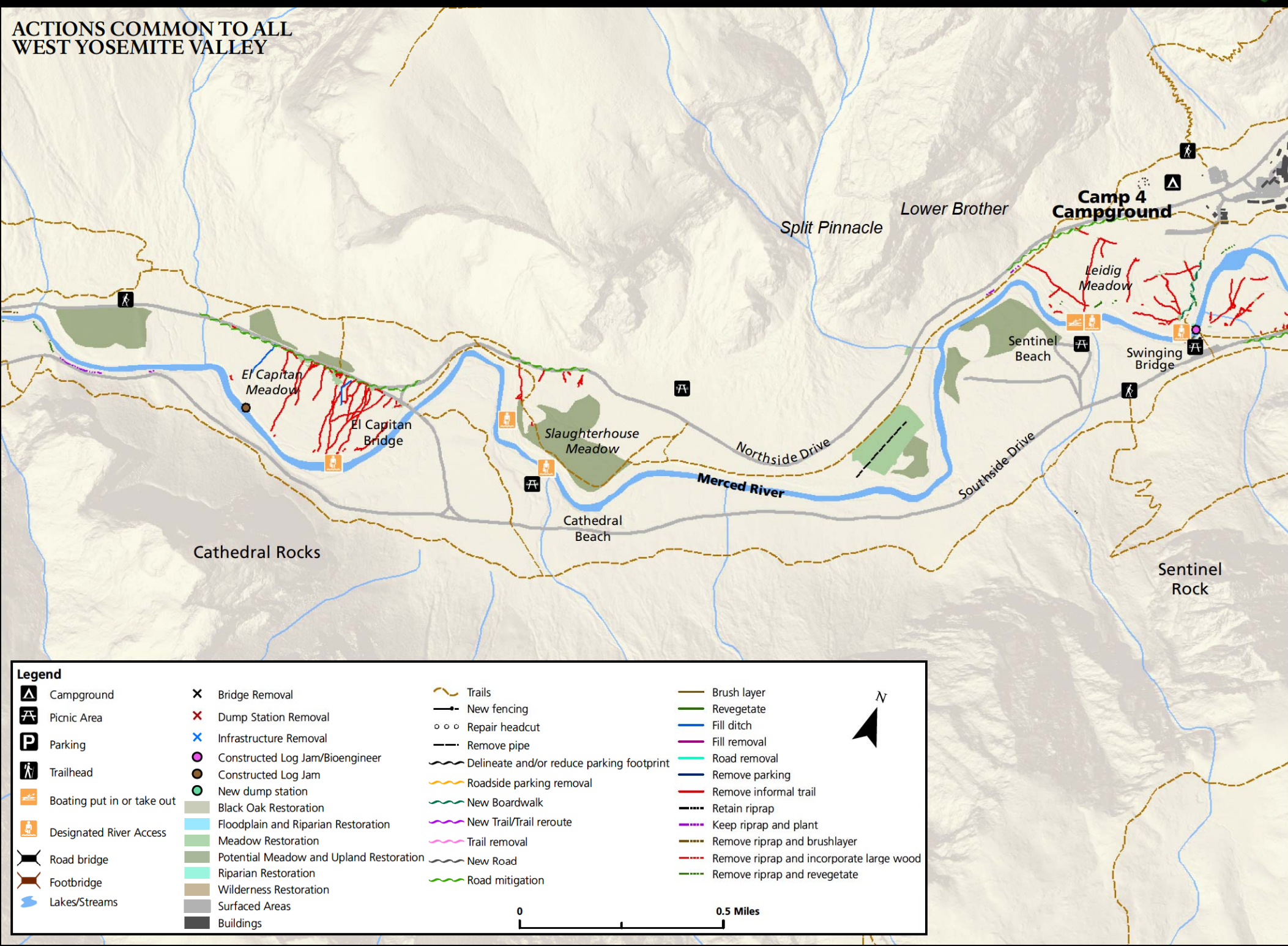
- |   |   |  |
|---|---|--|
| Campgrounds                             | Trails                                    |  |
| Picnic Area                             | New fencing                               |  |
| Parking                                 | Repair headcut                            |  |
| Trailhead                               | Remove pipe                               |  |
| Boating put in or take out              | Delineate and/or reduce parking footprint |  |
| Designated River Access                 | Roadside parking removal                  |  |
| Road bridge                             | New Boardwalk                             |  |
| Footbridge                              | New Trail/Trail reroute                   |  |
| Lakes/Streams                           | Trail removal                             |  |
| Bridge Removal                          | New Road                                  |  |
| Dump Station Removal                    | Road mitigation                           |  |
| Infrastructure Removal                  | Brush layer                               |  |
| Constructed Log Jam/Bioengineer         | Revegetate                                |  |
| Constructed Log Jam                     | Fill ditch                                |  |
| New dump station                        | Fill removal                              |  |
| Black Oak Restoration                   | Road removal                              |  |
| Floodplain and Riparian Restoration     | Remove parking                            |  |
| Meadow Restoration                      | Remove informal trail                     |  |
| Potential Meadow and Upland Restoration | Retain riprap                             |  |
| Riparian Restoration                    | Keep riprap and plant                     |  |
| Wilderness Restoration                  | Remove riprap and brushlayer              |  |
| Surfaced Areas                          | Remove riprap and incorporate large wood  |  |
| Building                                | Remove riprap and revegetate              |  |

0 0.1 0.2 Miles





### ACTIONS COMMON TO ALL WEST YOSEMITE VALLEY



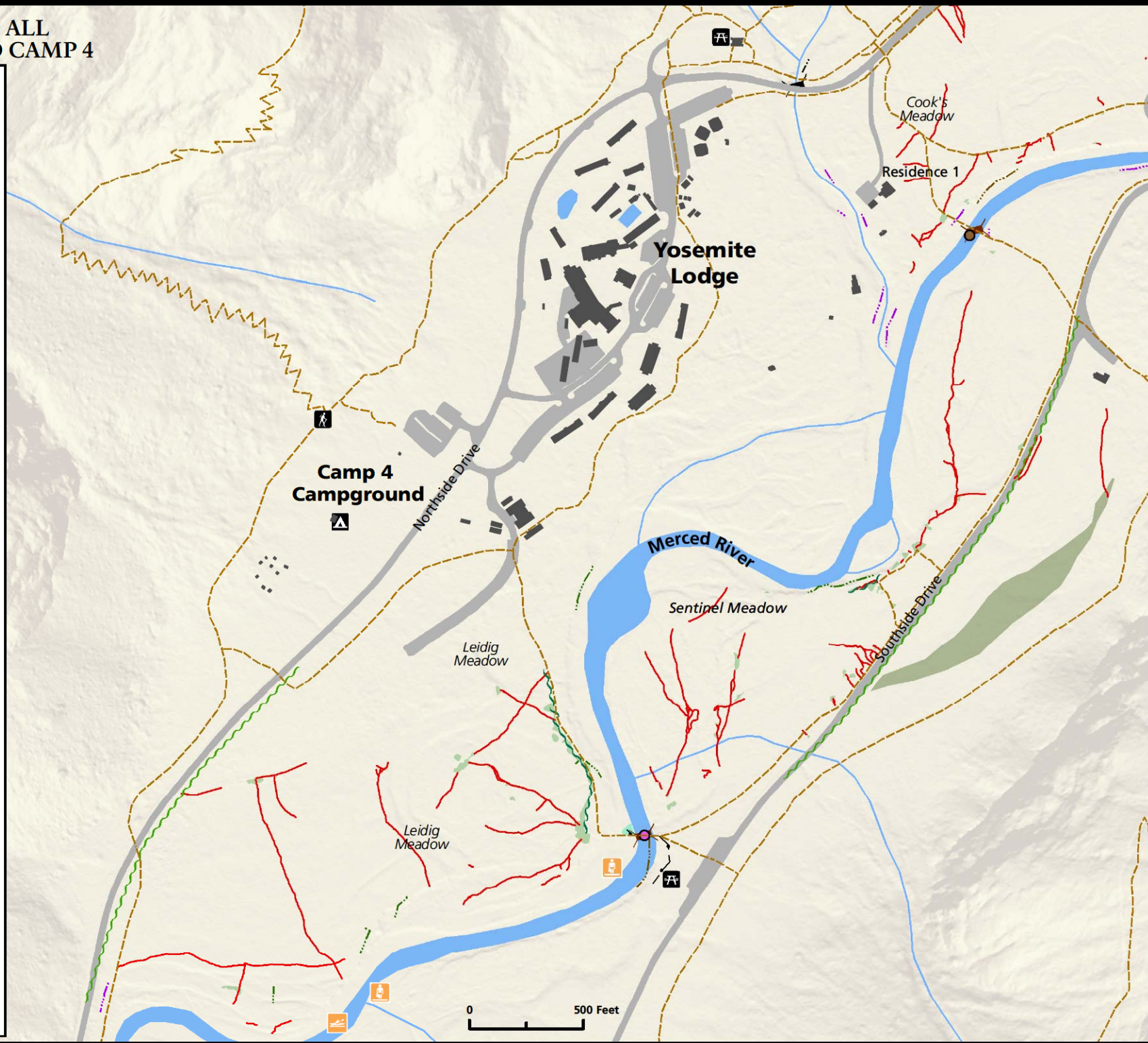




### ACTIONS COMMON TO ALL YOSEMITE LODGE AND CAMP 4

#### Legend

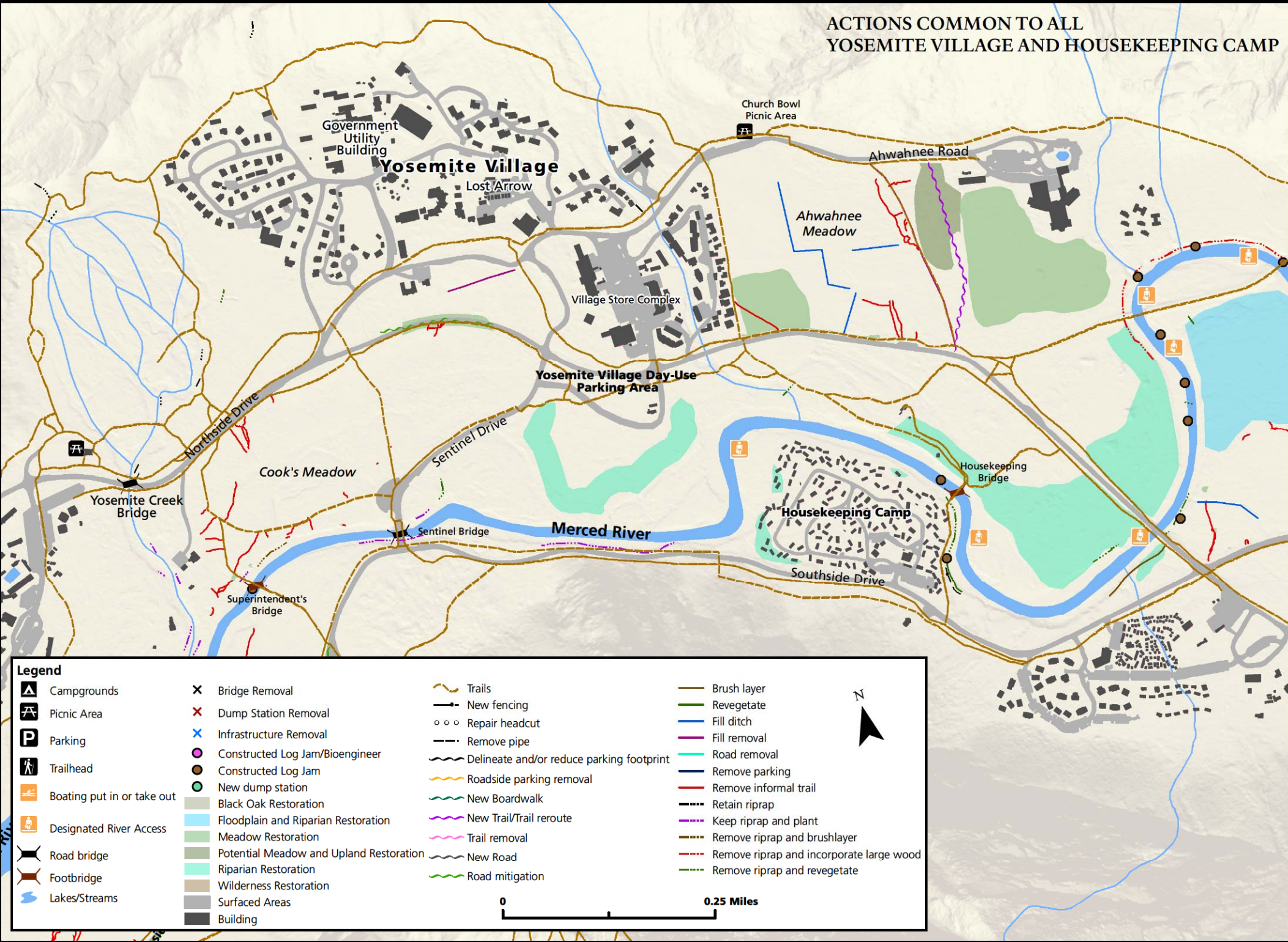
- Campground
- Picnic Area
- Parking
- Trailhead
- Boating put in or take out
- Designated River Access
- Road bridge
- Footbridge
- Lakes/Streams
- Bridge Removal
- Dump Station Removal
- Infrastructure Removal
- Constructed Log Jam/Bioengineer
- Constructed Log Jam
- New dump station
- Black Oak Restoration
- Floodplain and Riparian Restoration
- Meadow Restoration
- Potential Meadow and Upland Restoration
- Riparian Restoration
- Wilderness Restoration
- Surfaced Areas
- Buildings
- Trails
- New fencing
- Repair headcut
- Remove pipe
- Delineate and/or reduce parking footprint
- Roadside parking removal
- New Boardwalk
- New Trail/Trail reroute
- Trail removal
- New Road
- Road mitigation
- Brush layer
- Revegetate
- Fill ditch
- Fill removal
- Road removal
- Remove parking
- Remove informal trail
- Retain riprap
- Keep riprap and plant
- Remove riprap and brushlayer
- Remove riprap and incorporate large wood
- Remove riprap and revegetate







### ACTIONS COMMON TO ALL YOSEMITE VILLAGE AND HOUSEKEEPING CAMP



**APPENDIX F**

**ACOUSTICAL MEASUREMENT LOCATIONS**

## **APPENDIX F**

### **ACOUSTICAL MEASUREMENT LOCATIONS**

This appendix includes Tables F-1 and F-2, which provide detailed descriptions of the acoustical measurement locations and corresponding levels and sources, and Figure F-1, which illustrates the acoustical measurement locations listed in the tables.

**TABLE F-1: SUMMARY OF NOISE MEASUREMENTS**

#	Date	Time	Location	Background Level (dBA)	Description of Sound / Noise Sources
1	9/11/99	8:30	First Merced River pedestrian bridge on John Muir Trail – base of Vernal Falls.	64.0	River sounds predominated. Also, visitor-related noise contributed somewhat. Vernal Falls was audible in the distance.
2	9/11/99	9:10	On the “mist” trail that winds up to Little Yosemite Valley adjacent to Vernal Falls.	75.5	Waterfall noise predominated. Maximum noise levels of up to 81 dBA were associated with people talking and yelling.
3	9/11/99	9:50	Viewing area atop Vernal Falls, overlooking the river and falls.	65.5	The falls produced the background sound environment and accounted for most of the measured level. Visitor-related noise sources accounted for the remainder. Maximum noise levels up to 70 dBA were associated with people talking and yelling.
4	9/11/99	10:47	Viewing area atop Nevada Falls overlooking river, trail bridge and falls.	60.5	The falls produced the background sound environment and accounted for most of the measured level. Visitor-related noise sources accounted for the remainder.
5	9/11/99	12:00	Little Yosemite Valley campground area - approximately 700 feet east from river.	40.0	Rushing water accounted for campground area background levels. Measurements were taken in an area with no people.
6	9/11/99	3:00	Bunnell Cascade area (3 miles east of Little Yosemite Valley), on trail adjacent to river.	53.5	Rushing water over granite cascades predominated. No visitor noise occurred during measurement.
7	9/12/99	11:00	Soda Springs, about 2 miles east of Merced Lake at river side.	56.0	Rushing water over granite cascades predominated. No visitor noise occurred during measurement.
8	9/12/99	11:30	0.25 miles, off trail, away from river, north of Soda Springs area.	41.5	Forest-related sounds predominated (birds, insects, and slight wind through trees). River sounds were also discernible.
9	9/12/99	16:15	One-half mile south of Washburn Lake on trail about 300 feet to river.	34.5	Background sound level reflected distant rushing water and nearby forest sources (birds, insects, and wind through trees).
10	9/12/99	16:30	On the shore at mid-portion of Washburn Lake.	30.5	No discernible sources of sound were observed. Sound level measurement approximates the limit of detection for the meter.
11	9/12/99	15:30	1 mile southeast of Washburn Lake within the overall Merced River confluence area. About 100 feet off river on trail.	35.5	Sources included distant river rapids wind in trees, and birds.
12	9/12/99	13:30	About 2 miles southeast of Washburn Lake near twin bridge at mouth of Merced Peak Fork River. About 200 feet from river.	40.5	Canyon was narrow in this area, and the river sound seemed amplified. Most sound was from river; other sources included wind in trees, birds, and high-altitude aircraft. Maximum noise level from aircraft overflight was 43 dBA.
13	9/12/99	14:30	On trail, climbing out of the Merced Peak Fork River valley, about 2.5 miles from Washburn. Gaining elevation away from river.	38.5	Rushing water sounds were noticeable but faded with elevation. Maximum noise level of 55.5 dBA was caused by an aircraft overflight directly overhead, which was clearly noticeable above the background level.

**TABLE F-1: SUMMARY OF NOISE MEASUREMENTS (CONTINUED)**

#	Date	Time	Location	Background Level (dBA)	Description of Sound / Noise Sources
14	9/12/99	15:10	On trail almost to saddle on the divide between the Merced Peak Fork and Triple Peak Fork.	35.0	Sources included distant rushing water and wind. Valley shape and exposed bedrock seemed to amplify river sounds.
15	9/18/99	8:40	Yosemite Falls Trail, second footbridge north of Northside Drive.	45.5	No water in Yosemite Falls Creek, people on trail, road traffic on Northside Drive (approximately 150 feet south of measurement location).
16	9/18/99	9:00	Yosemite Falls Trail, end of maintained foot trail (approximately 1,000 feet north of previous measurement).	46.5	There was no water in Yosemite Falls Creek. Visitors using the trail were the predominant source of noise. Maximum level of 65.5 dBA was associated with people talking as they walked past.
17	9/18/99	9:30	Devil's Elbow (on south side of Northside Drive adjacent to Merced River).	44.0	River sounds were relatively low since there were no rocks or rapids in this area. Very few people were around. Maximum level of 66.5 dBA associated with a bus on Northside Drive.
18	9/18/99	9:50	El Capitan Meadow approximately 1,500 feet south of Northside Drive.	38.5	The river was calm in this area, and no people were present. Most of the sound came from wind through the trees on the opposite bank of the river.
19	9/18/99	10:30	El Portal Road in the Gorge Segment of the Merced River. Along the river at the stone bridge between Arch Rock and Big Oak Flat Road.	52.0	Rushing water sounds accounted for majority of the background level. Measurements were taken in area with no people. Some vehicle noise was audible from El Portal Road, but it was relatively minor due to distance (approximately 300 feet away) and elevation (the river is approximately 40 feet below the grade of the roadway in this area).
20	9/18/99	11:15	Cascades Dam (approximately 500 feet east of dam along river area that is calm due to impoundment from the dam).	48.5	The river was calm in this area, people were fishing nearby, and some noise was attributable to their activities. Maximum noise level of 62.5 dBA was due to a bus on Northside Drive.
21	9/18/99	12:00	Swinging Bridge.	49.5	River was generally calm in this area. Visitors using the bridge or wading or skipping stones were the greatest sources of noise.
22	9/18/99	12:30	Sentinel Bridge.	58.5	Substantial amount of visitor-related noise was observed in this area. Vehicular traffic on bridge added to the level, but speeds were generally slow (10-15 mph). Idling tour buses also contributed to background noise level. Maximum noise level of 76.5 dBA was associated with tour buses that use the bridge.
23	9/18/99	14:40	Happy Isles.	59.0	Most of the noise was from people using the trails and facilities nearby.

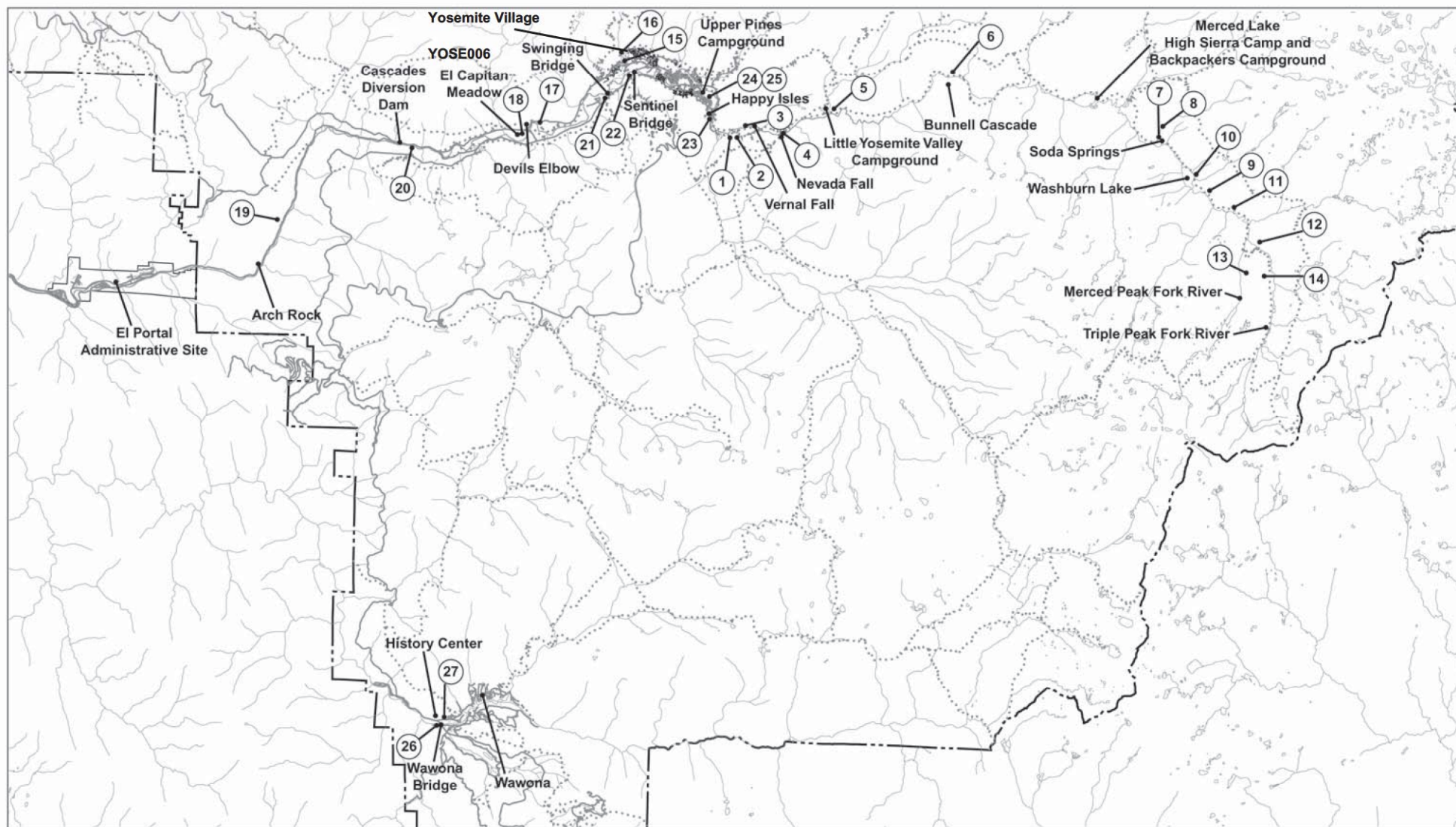
**TABLE F-1: SUMMARY OF NOISE MEASUREMENTS (CONTINUED)**

#	Date	Time	Location	Background Level (dBA)	Description of Sound / Noise Sources
24	9/18/99	19:45	Midway between the river and main access road to the Upper Pines Campground.	55.0	Noise was generally from the campground and includes people talking (and yelling), generators from recreational vehicles, and moving vehicles.
25	9/19/99	6:00	Same location as #24.	32.0	No human-caused noise sources were discernible at the time this measurement was taken.
26	9/19/99	10:30	In the middle of the old Wawona Bridge.	49.5	Most of the noise was associated with the use of the Wawona General Store across the roadway (i.e., people talking or yelling, buses idling, vehicular traffic noise). Maximum noise level of 58.5 dBA was associated with a truck crossing the replacement bridge.
27	9/19/99	10:45	Along South Fork approximately 100 feet west of the covered bridge near the Pioneer History Center in Wawona.	44.0	River sounds were noticeable with a few minor rapids and cascades. Other sources of noise included people using the history center and horses and stagecoach crossing the covered bridge.
NOTE: See Figure F-1 for a map showing the locations of the noise measurement sites.					

**TABLE F-2: SUMMARY OF NOISE MEASUREMENTS**

Site #	Year	Location – Habitat Type	Measured Median Noise Level, dB L50 Daytime/Nighttime
YOSE001	2005	White Wolf – Red fir forest	27.7/26.0
YOSE002	2005	Tuolumne Meadows – Meadow/lake open area below treeline	34.7/34.7
YOSE003	2005	Snow Flats – Subalpine/lodgepole	29.3/18.2
YOSE004	2005	Granite Lakes – Alpine tundra	27.5/20.1
YOSE005	2006	Lyell Winter Site – Meadow/lake open area below treeline	27.1/22.4
YOSE006*	2006	Yosemite Village – Developed concession area	51.6/48.0
YOSE007	2006	Hodgdon Meadow – Dense mixed conifer	28.5/18.7
YOSE008	2006	Sentinel Rock – Upper vertical canyon	31.9/29.3
YOSE009	2006	Ostrander Lake Trail – Dense lodgepole	28.6/21.3
YOSE011	2006	Olmstead Point – Vertical canyon/open lodgepole	34.6/21.3
<p>NOTE: See Figure F-1 for a map showing the locations of the noise measurement sites.</p> <p>* Site YOSE006 is the only 2005-2006 acoustical monitoring site within the Merced River Wild and Scenic River Corridor, and therefore is the only such site depicted on Figure F-1.</p> <p>SOURCE: Yosemite National Park Acoustic Monitoring Report, 2005 &amp; 2006.</p>			





- (n) Noise Measurement Locations
- Rivers and Creeks
- ... Trails
- - - Boundary
- Roads



Prepared for:  
National Park Service  
Department of the Interior



Prepared by:  
MIG, Inc.  
Environmental Science Associates  
July 2012

**Figure F-1**  
**Noise Measurement Locations**

Draft Merced Wild and Scenic River  
Comprehensive Management Plan/EIS

**APPENDIX G**

**ON-ROAD VEHICLE CRITERIA POLLUTANT AND  
GHG EMISSION ESTIMATES**

Scenario Year: 2020						
All model years in the range 1976 to 2020			Highest (Most Conservative) EMFAC2007 (version 2.3)			
Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)		Emission Factors for On-Road Passenger Vehicles and Delivery Trucks		
CO	0.00444247	CO	0.00799617	Projects in the SCAQMD		
NOx	0.00040506	NOx	0.00831802	Derived from Peak Emissions Inventory (Winter, Annual, Summer)		
ROG	0.00052463	ROG	0.00122382	Emissions (pounds per day) = N x TL x EF		
SOx	0.00001073	SOx	0.00002733	where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)		
PM10	0.00009550	PM10	0.00035054	All the emission factors account for the emissions from start, running and idling exhaust.		
PM2.5	0.00006279	PM2.5	0.00027128	In addition, the ROG emission factors include diurnal, hot soak, running		
CO2	1.10456157	CO2	2.85148109	and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.		
CH4	0.00004495	CH4	0.00005330	Delivery truck Efs are an average for MDV and HDV and were used to estimate emissions for buses		
# Visitor Vehicles/day	Air Pollutant Emissions	Visitors – lbs/yr (during high and shoulder seasons (240 days))	Buses - lbs/yr (based on 7 day/wk, 50 wk/yr ops)	tons per year	Minus Alt 1	
<b>ALTERNATIVE 1</b>						
	18675.83	CO	433226.5723	4437.076634	219	0
		NOx	39501.13542	4615.666883	22	0
VMT/day	406330.1	ROG	51161.13987	679.0979535	26	0
		SOx	1046.08355	15.16690013	1	0
Annual Bus #s	10565	PM10	9312.69502	194.5154942	5	0
Annual Bus VMT	554900	PM2.5	6123.415904	150.5314838	3	0
From GHG Inventory		CO2	107715988.6	1582286.856	49576.86 MT	
		CH4	4383.345218	29.57545526	2.001667 MT	
					49619 CO2E	0
<b>ALTERNATIVE 2</b>						
	14314.17	CO	332048.2278	4926.842256	168	-51
		NOx	30275.8022	5125.145341	18	-4
VMT/day	311433.3	ROG	39212.65895	754.0569545	20	-6
		SOx	801.7748937	16.84102634	0	-1
Annual Bus #s	11265	PM10	7137.752102	215.9861628	4	-1
Annual Bus VMT	616150	PM2.5	4693.316451	167.1471864	2	-1
From GHG Inventory		CO2	82559347.46	1756940.073	38245.22 MT	
		CH4	3359.632359	32.84000137	1.538799 MT	
					38278 CO2E	-11341
<b>ALTERNATIVE 3</b>						
	13935.42	CO	323262.2978	4926.842256	164	-55
		NOx	29474.71051	5125.145341	17	-5
VMT/day	303192.9	ROG	38175.0998	754.0569545	19	-7
		SOx	780.5600896	16.84102634	0	-1
Annual Bus #s	11265	PM10	6948.888603	215.9861628	4	-1
Annual Bus VMT	616150	PM2.5	4569.132232	167.1471864	2	-1
From GHG Inventory		CO2	80374843.57	1756940.073	37254.34 MT	
		CH4	3270.737156	32.84000137	1.498477 MT	
					37286 CO2E	-12333
<b>ALTERNATIVE 4</b>						
	16089.17	CO	373223.2132	5668.487342	189	-30
		NOx	34030.09333	5896.641293	20	-2
VMT/day	350052	ROG	44075.14736	867.5662988	22	-4
		SOx	901.1974077	19.37613174	0	-1
Annual Bus #s	12490	PM10	8022.854971	248.4988896	4	-1
Annual Bus VMT	708900	PM2.5	5275.301899	192.3081076	3	0
From GHG Inventory		CO2	92796956.48	2021414.944	43008.88 MT	
		CH4	3776.236942	37.7834569	1.73001 MT	
					43045 CO2E	-6574

# Visitor Vehicles/day		Air Pollutant Emissions	Visitors – lbs/yr (during high and shoulder seasons (240 days))	Buses - lbs/yr (based on 7 day/wk, 50 wk/yr ops)	tons per year	Minus Alt 1
<b>ALTERNATIVE 5</b>						
	17812.08	CO	413190.0125	8914.933752	211	-8
		NOx	37674.22333	9273.755646	23	1
VMT/day	387537.5	ROG	48794.95713	1364.437391	25	-1
		SOx	997.7025944	30.4731969	1	0
Annual Bus #s	20015	PM10	8881.986511	390.8187502	5	0
Annual Bus VMT	1114900	PM2.5	5840.210309	302.4464792	3	0
From GHG Inventory		CO2	102734166.2	3179116.266	48041.45 MT	
		CH4	4180.617213	59.42273395	1.923249 MT	
					48082 CO2E	-1537
<b>ALTERNATIVE 6</b>						
	18801.25	CO	436135.8847	9362.719464	223	4
		NOx	39766.40341	9739.564522	25	3
VMT/day	409058.8	ROG	51504.71007	1432.971335	26	0
		SOx	1053.108474	32.00382657	1	0
Annual Bus #s	20715	PM10	9375.233979	410.4490758	5	0
Annual Bus VMT	1170900	PM2.5	6164.537411	317.6379787	3	0
From GHG Inventory		CO2	108439350.2	3338799.207	50701.71 MT	
		CH4	4412.781363	62.40746182	2.029911 MT	
					50744 CO2E	1125

**APPENDIX H**

**SCENIC VISTA MANAGEMENT IN THE  
MERCED RIVER CORRIDOR**

## APPENDIX H

### SCENIC VISTA MANAGEMENT IN THE MERCED RIVER CORRIDOR

The *Scenic Vista Management Plan for Yosemite National Park Environmental Assessment* (SVMP), completed in 2010, inventoried 181 potential vista points throughout the park, outside of wilderness and chiefly along the major roads. The plan outlined a programmatic framework for prioritizing and prescribing the work to be completed at each of the viewpoints necessary to obtain a desirable vista. The 2010 *Finding of No Significant Impact* (FONSI) stipulates that the final determination of vista points for the Merced Wild and Scenic River corridor would be deferred to the comprehensive river management plan completion. Once an alternative has been selected in a Record of Decision, the management actions included in that selected alternative will be incorporated into the Merced River Plan to guide the future management of scenic values in the Merced River corridor.

This approach captures the programmatic direction, methods outlined in the SVMP, and analyzes the viewpoints from the perspective of the Wild and Scenic Rivers Act mandate to protect and enhance the values of the Merced Wild and Scenic River.

The scenery along the Merced River—considered an outstandingly remarkable value—offers outstanding views of the river valley, adjacent meadows, glaciated geology and hanging valleys. The locations where these tremendous views intersect with frequent visitation are often along roads and near historic buildings. As originally inventoried in the SVMP, eighty-three of these sites were located in, or adjacent to the Wild and Scenic River corridor of the Merced River. Upon analyzing these vista locations within the context of the Merced River Plan and considerations for river values (including free flow, water quality, and outstandingly remarkable values), thirty-two of these sites were removed from consideration. Reasons for removal range from sites encroaching on declared Wilderness areas, removal of the viewing area under proposed actions of the MRP, or sites being very similar to other nearby vistas. The inventory of sites includes analysis of each site with a Visual Resource Assessment (VRA) score that looks at a vista site with factors such as current infrastructure, numbers of scenic icons and quality of the view, and quantifies them for comparison. The sites are then prioritized by VRA score as high, medium or low based on their score up to eighteen. Low priority sites, scoring seven and below, are also be removed from consideration. The remaining sites are summarized and the proposed work actions analyzed regarding how the management of scenic vistas will take place as described under the *Scenic Vista Management Plan*, and comply with Merced River Plan to protect and enhance river values. As stated in the SVMP, the goal is not to remove all trees within a vista, but to remove a minimal number in order to allow a view, retain a natural appearance, and with the least invasive management practicable.

This appendix describes the impact over the projected life, typically twenty years for management plans, of the MRP. Some vistas are currently open, but will likely be encroached during this time frame, given past trends of conifer growth. The descriptions of estimated impact of trees removed during initial management for each vista point are by species and size as they are in 2012. Trees less than 6” diameter at breast height (dbh) can be removed in order to maintain a vista without additional

compliance, and are not included in the estimates. If more trees than estimated over 6" dbh need to be removed, additional compliance will need to be completed.

Following tree removal, the work area will be revegetated with native vegetation, if necessary, the soil will be decompacted, and the area recontoured. Stumps must remain in place to provide soil stability. In order to preserve the natural aesthetic, stumps will be flush cut and buried. Seed collection and plant salvage will occur as necessary for revegetation after site work and tree removal are complete. An annual work plan will continue to be done that will describe the specific actions involved in initial management of removing larger trees, and maintenance involving revegetation or removing trees under 6" dbh. Approximately ten to twenty vista points will be done each year. This work plan will be posted on-line as described in the *SVMP*.

In the initial management of a vista, some downed trees may be left, but this will generally be no more than one tree in twenty. Trees which are removed will be used for traditional cultural purposes, chipped, left as woody debris in the river, or hauled away. If chipped, wood chips would remain on site (outside of meadows) as mulch (no more than 1 inch deep). The small diameter vegetation is to be lopped and scattered such that any saw marks are not visible from the vista point. Remaining woody debris which maybe left will depend on the conditions at the time. Woody debris left on site must adhere to the *Fire Management Plan* guidelines of tons per acre of downed fuel levels.

Maintaining these viewpoints will further enhance the visitor's recreation enjoyment and enhance their connection to the natural world along the Merced River. At the same time, management of scenic vistas at these select locations must protect biological, cultural values (archeological sites and places of significance to American Indian tribes and groups), water quality, and the free-flowing condition of the river. Management will involve removal of trees, and when completed following careful review and attention to ORV protection will ensure that all other biological and cultural values are minimally affected. The outstandingly scenery will continue to evolve in response to natural ecological processes.

Providing and maintaining viewing areas at existing infrastructure (such as roadside turnouts) lessens the frequency of visitors creating or using social trails in order to see a view that is referred to in existing signs and publications. Many park visitors' (87%) primary purpose when visiting the park is to take a scenic drive (Littlejohn et al 2006). Removing a limited number of trees in locations which support visitor use will give visitors an incentive to remain on durable surfaces and therefore not tread in more sensitive areas. Through visitors remaining on durable surfaces, the environment will be better protected and biological resources will be enhanced. Vista management in the Merced WSR corridor should reestablish vistas that once existed, without degrading other outstandingly remarkable values. What follows is a description of the work plan for each of the viewpoints established for the Merced River corridor. Each work plan provides

- A description of the viewpoint and its specific location
- Ecological considerations, particularly as they pertain to vegetation
- A summary of the trees greater than 6" dbh that currently are, or potentially could, obscure the vista over the next twenty years. Trees are described by species and size dbh as of 2012.

RES-3-002

## Cascade Falls Viewpoint (8-Medium)

*Location: El Portal Road*

*View: Cascade Falls*

Cascade Falls is located three miles east of the Arch Rock entrance station. The falls can be viewed from a formal viewing point located adjacent to the Cascade Falls parking area. The current view of the falls is narrow and should be opened to allow better visibility. Mature trees and shrubs in front of the viewing area and falls could obscure the view in the near future. This site contains mature California Black Oak, which is a species that will not be removed in a medium value vista. The oaks are growing between the viewing area and the waterfall, but they are unlikely to become much taller, and as a result will likely obscure only the bottom of the falls.



**Figure H-1:** Cascade Falls. NPS 2009

The El Portal Road was constructed in 1908, but turnouts were not added until 1932. Trees established before 1932 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 35. This site rated a medium priority with an average VRA score of 8 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	1	1	1	-	3
Cedar	6	-	-	1	7
Live Oak	-	1			1
Red Fir	3	-	-	-	3
Ceanothus (shrub)	Trim 1				
<b>Total</b>					<b>14</b>



## RES-2-120

**Bridalveil Fall Approach**

(10.25-High)

*Location: Southside Drive**View: Bridalveil Falls*

The Bridalveil Fall Approach is located on Southside Drive, 0.30 miles east of Pohono Bridge. Southside Drive heads directly to the falls before turning to the east at Bridalveil Meadow. This is one of the first waterfalls visitors see when entering the Yosemite Valley. The current view of the fall is very narrow and can only be seen along a brief segment of road. Further encroachment of mature trees from the sides of the road could block the view completely. This site contains a large number of cedar, fir and ponderosa saplings/seedlings that would need to be removed in the initial management of the site.



**Figure H-2:** Bridalveil Fall Approach. NPS 2009

The road in its current configuration was completed in 1928. Trees established before 1928 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 152. This site rated a high priority with an average VRA score of 10.25 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	6	1	1	2	10
Cedar	27, Trim 3	-	-	-	27
Fir	10	1	-	-	11
Live Oak	2	1	-	-	3
Dogwood	1	-	-	-	1
<b>Total</b>					<b>52</b>

RES-2-119

## Roosevelt Turnout

(10.5-High)

*Location: Southside Drive*

*View: Bridalveil Falls*

The Roosevelt Turnout is located 0.45 miles east Pohono Bridge. The focal point of the Roosevelt Turnout is Bridalveil Falls with a portion of Bridalveil meadow in the foreground. This sign commemorates the general location of where John Muir and Theodore Roosevelt camped in 1903. The current view is completely obscured by many conifers going back to the Wawona Road. A number of trees less than 6" dbh would also be removed during initial management of the site.



**Figure H-3:** Roosevelt Turnout. NPS 2009

The road in its current configuration was completed in 1928. Trees established before 1928 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 156. This site rated a high priority with an average VRA score of 10.5 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	-	11	14	4	1	30
Cedar	76	11	8	2	1	98
Fir	23	3	1	1	-	28
<b>Total</b>						<b>156</b>

RES-2-127

**Tunnel View**

(15.2-High)

*Location: Wawona Road**View: Yosemite Valley*

Tunnel View is located east of the Wawona Tunnel, 1.5 miles southwest from the intersection of Southside Drive and Wawona Road. Tunnel View is one of the most popular vistas in the park with a magnificent panoramic view of the Yosemite Valley and iconic natural landmarks such as Bridalveil Fall, El Capitan, and Half Dome. It is part of the Yosemite Road Guide (W2). The area was rehabilitated and the vista opened in 2008. There are no trees currently obscuring the vista, although some trees could obscure the view in the future. This site should be monitored and the trees listed below could be removed if they further obscure the view in the future.



**Figure H-4:** Tunnel View. NPS 2009

Wawona Tunnel was constructed in 1933. Trees established before 1933 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 49. This site rated a high priority with an average VRA score of 15.2 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	TOTAL
Cedar	5	-	5
Ponderosa	2	1	3
<b>Total</b>			<b>8</b>

RES-2-078

## Bridalveil Straight interpretive sign (13-High)

*Location: Southside Drive**View: Bridalveil Falls*

The Bridalveil Straight interpretive sign is located 0.25 miles east of the intersection of Southside Drive and Wawona Road. This vista is listed as a contributing feature to the Yosemite Valley Historic District. The focal point of the vista to be managed is Bridalveil Fall to the south. This location also has spectacular view of El Capitan to the east, over California Black Oaks. It is unlikely the oak trees will grow tall enough to obscure the view to El Capitan, but this area should also be monitored in the future for conifer encroachment.



**Figure H-5:** Bridalveil Straight. NPS 2009

The road in its current configuration was constructed in 1928. Trees established before 1928 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 38. This site rated a high priority with an average VRA score of 13 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	-	3	1	-	4
Cedar	8	31	1	5	45
Fir	-	3	-	3	6
Black Oak	Trim				
<b>Total</b>					<b>55</b>

RES-2-075

**Bridalveil Fall Foot Bridge**

(7.25-Medium)

*Location: Bridalveil Trail**View: Bridalveil Fall*

The Bridalveil Fall Foot Bridge is located on the Bridalveil Fall trail at the base of the fall. This vista is from one of three bridges built in 1913 at the waterfall. These are the oldest remaining bridges in the valley. The intention in managing this vista is not to create a broad view, but a focused and intimate view of the fall.

Trees established before 1913 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 37. This site rated a medium priority with an average VRA score of 7.25 out of 18.



**Figure H-6:** Bridalveil Fall Foot Bridge. NPS 2009

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<40" dbh	<50" dbh	TOTAL
Douglas fir	1	-	-	2	3
Black Oak	Trim				
Live Oak	-	2	-	-	2
Cedar	-	-	1	-	1
<b>Total</b>					<b>6</b>



RES-2-121

## Cathedral Spires Turnout (7.5-Medium)

*Location: Southside Drive*

*View: Cathedral Spires and Rock*

The Cathedral Spires Turnout on Southside Drive is located 1.3 miles east of the Wawona Road and Southside Drive intersection. This vista is listed as a contributing feature of the Yosemite Valley Historic District.

The Valley Loop Road in its current configuration was constructed in 1928.

Trees established before 1928 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 225. This site rated a medium priority with an average VRA score of 7.5 out of 18.



**Figure H-7:** Cathedral Spires. NPS 2012

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Cedar	5	-	6	1	-	12
Douglas Fir	-	6	1	-	1	8
Ponderosa	-	1	-	-	-	1
<b>Total</b>						<b>21</b>

## RES-2-158

**Cathedral Beach Parking**

(9.75-Medium)

*View: Three Brothers*

The Cathedral Beach Parking area is located on Southside Drive 0.25 miles east of the El Capitan Crossover.

This vista is located on the terrace above the restroom. There were two vistas inventoried from this area, this one, and another from the beach. The recommendation is to manage the vista from this location and not the vista from the beach. The view to Three Brothers is similar, and new parking could be built in this location to better accommodate visitors. Trees established before 1928 should not be removed when managing this vista.



**Figure H-8:** Cathedral Beach Parking. NPS 2012

The site was inventoried as part of the Scenic Vista Management Plan as site number 226. This site rated a medium priority with an average VRA score of 9.75 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	6	2	5	9	2	24
Cedar	42	11	3	9	-	65
Fir	1	2	1	-	-	4
Black Oak	-	1	-	-	-	1
<b>Total</b>						<b>94</b>

RES-2-091

## El Capitan Postage Stamp Turnout (9.5-Medium)

*Location: Northside Drive**View: El Capitan, Merced River*

The El Capitan Postage Stamp Turnout is located on Southside Drive 0.45 miles east of the El Capitan Drive intersection. The history of this vista began in 1868 when Carlton Watkins captured a photograph of El Capitan a few feet from the current turnout in 1868. This photograph was used in a postage stamp in 1934. It was a popular vista at one time, but is now almost completely obscured with conifers. There are a large number of dead trees in the area and the intention is to remove the smaller trees that have less habitat value and also reduce the fuel load. Several large deciduous riparian trees partially obscure the view, but will not be removed for vista management because of their high habitat potential.



**Figure H-10:** El Capitan Postage Stamp. NPS 2009

The road was completed in 1928, so trees established before then should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 3. This site rated a medium priority with an average VRA score of 9.5 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Cedar	53 (28?)	4	4	9	3	73
Ponderosa	1	4	5	8	4	22
Live Oak	1	-	-	-	-	1
<b>Total</b>						<b>96</b>

### SNAGS TO REMAIN

Tree Species	<12" dbh	<20" dbh	<40" dbh	TOTAL
Cedar		1		1
Oak		1	1	2
Willow	2			2
<b>Total</b>				<b>5</b>

### SNAGS TO REMOVE

Tree Species	<12" dbh	TOTAL
Cedar	15	15
<b>Total</b>		<b>15</b>



RES-2-092

## Ferry Bend Turnout (12-High)

*Location: Southside Drive*

*View: El Capitan, Merced River*

Ferry Bend Turnout is located on Southside Drive 1.17 miles east of the El Capitan Road intersection. The turnout is near where Ira Folsom began a ferry in 1871 to cross the Merced. The vista of the river and El Capitan is a contributing feature to the Yosemite Valley Historic District. The vista should be managed from the turnout to allow people to enjoy the view with minimal damage to the vegetation. Trees established before 1928 should not be removed from this location for vista management.



**Figure H-11:** Ferry Bend. NPS 2009

This site has a considerable number of snags from a managed burn in 2004. The area surveyed is approximately 4 acres. The intention is to remove snags less than 12" dbh, and retain any larger snags. This would retain 23 snags between 20" and 40" dbh, and remove 53 snags less than 12" dbh. There would also be a considerable number of cedar saplings and trees less than 6" dbh removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 44. This site rated a high priority with an average VRA score of 12 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	<60" dbh	<70" dbh	TOTAL
Ponderosa	6	23	59	62	14	3	3	170
Cedar	41	56	30	21	5	-	1	154
Fir	-	1	6	2	2	1	-	12
<b>Total</b>								<b>336</b>

### SNAGS TO REMOVE

Tree Species	<12" dbh	TOTAL
Ponderosa Snag	4	4
Cedar Snag	48	48
Fir Snag	1	1
<b>Total</b>		<b>53</b>

### SNAGS TO RETAIN

Tree Species	<20" dbh	<30" dbh	TOTAL
Ponderosa Snag	3	-	3
Cedar Snag	17	3	20
<b>Total</b>			<b>23</b>

RES-2-115

## Sentinel Beach Picnic Area

(11.25-High)

*Location: Southside Drive*

*View: Sentinel Rock*

Sentinel Beach is adjacent to the Sentinel Beach picnic area located off of Southside Drive 1.7 miles east of the intersection of El Capitan Road. This is a popular destination for picnicking, and is also the pullout and shuttle stop for raft rentals. Trees established before 1928 should not be removed from this location.

An alternative picnic and parking area is considered under the MRP at the location initially surveyed. It is recommended that this site is managed within the new developed area because it would create a better, more durable platform for visitors' to enjoy the vista.



**Figure H-12:** Sentinel Beach. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 22. This site rated a high priority with an average VRA score of 11.25 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	1	3	7	11
Cedar	-	5	5	10
<b>Total</b>				<b>21</b>

RES-2-093

**Four Mile Trailhead**

(10.5-High)

*Location: Northside Drive**View: Yosemite Falls*

The Four Mile Trail Trailhead is located on Southside Drive 1.75 miles east of the El Capitan Crossover. The trail was completed in 1872, although some alteration in the trail took place in the 1920s, and the trailhead was likely rerouted at that time.

The road in its current configuration was completed in 1928. Therefore trees established before 1928 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 32. This site rated a high priority with an average VRA score of 10.5 out of 18.

**Figure H-13:** Four Mile Trailhead. NPS 2009**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	TOTAL
Cedar	12	9	3	24
<b>Total</b>				<b>24</b>

RES-2-126

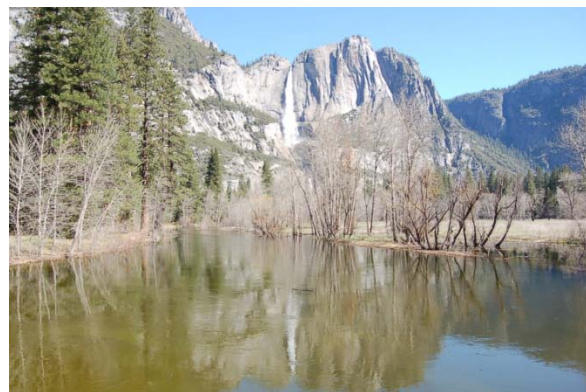
**Swinging Bridge**

(11.5-High)

*Location: Southside Drive**View: Yosemite Falls, Merced River*

The Swinging Bridge view point is located within the Swinging Bridge picnic area. The picnic area is located two miles east of El Capitan Crossover. There has been a footbridge in this location since 1938. An older bridge 200 feet downstream was destroyed in a flood which resulted in the construction of the 1938 bridge. The current structure was built in 1966.

Vista should be monitored and maintained, but no removal of trees larger than 6" dbh is

**Figure H-14:** Swinging Bridge. NPS 2009

recommended. Trees that are partially obscuring the lower falls are riparian deciduous trees that shade the river and have high habitat potential.

The site was inventoried as part of the Scenic Vista Management Plan as site number 23. This site rated a high priority with an average VRA score of 11.5 out of 18.

RES-2-118

## Sentinel Meadow Boardwalk (13.5-High)

*Location: Southside Drive*

*View: Yosemite Falls, Merced River*

The Sentinel Meadow Boardwalk is located on Southside drive 2.3 miles east of the El Capitan Crossover. Views from Sentinel Meadow are listed as contributing features in the Yosemite Valley Historic District. The vista is above the south bank of the Merced River, looking to Yosemite Falls. Trees to be removed are north of the river. No riparian species are to be removed. Although this meadow has numerous examples of historic photographs from the 19th century, the year of 1928 is a conservative date that can establish the Southside Drive and turnouts in its present location as an intended vista point. Trees established before 1928 should not be removed.



Figure H-15: Sentinel Meadow. NPS 2012

The site was inventoried as part of the Scenic Vista Management Plan as site number 6. This site rated a high priority with an average VRA score of 13.5 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<50" dbh	TOTAL
Ponderosa	40	3	4	47
Cedar	5	6	-	11
Fir	-	7	-	7
Total				65

RES-2-080

## Yosemite Valley Chapel (10.5-High)

*Location: Southside Drive*

*View: Yosemite Falls*

The Yosemite Valley Chapel is located on Southside Drive 2.5 Miles east of the El Capitan Crossover. The Chapel is the oldest building in the Valley. It was moved to its present location in 1901, but was originally built in 1879. There are some trees to remove in the immediate foreground, but most of the trees are taller conifers about 300 m away, across the meadow, that obscure the lower fall. Trees established before 1901 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 20. This site rated a high priority with an average VRA score of 10.5 out of 18.



**Figure H-16:** Chapel. NPS 2009

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<50" dbh	TOTAL
Ponderosa	5	1	1	7
Cedar	2	5	1	8
<b>Total</b>				<b>15</b>



RES-2-107

**Old Hutchings View**

(8.75-Medium)

*Location: Southside Drive**View: Yosemite Falls, Merced River*

Old Hutchings View is located adjacent to the southwest corner of Sentinel Bridge. This vista looks across the Merced River to Yosemite Falls. This is the view that originated from the Hutchings House (also called the Upper Hotel) that was across Southside Drive. The original hotel began in 1859, and was added onto during the tenure of James Hutchings. The current Sentinel Bridge was built in 1994, a replacement to a series of bridges that have been in this general location. A conservative date for the current location of the vista is 1928 with the layout of Southside Drive. Trees established before this time should not be removed. There are numerous conifer saplings that will also be removed during initial management of the site.

**Figure H-17:** Old Hutchings View. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 157. This site rated a medium priority with an average VRA score of 8.75 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<20" dbh	<40" dbh	TOTAL
Ponderosa	17	-	17
Cedar	-	1	1
<b>Total</b>			<b>18</b>

RES-2-116

**Sentinel Bridge**

(13.5-High)

*Location: Sentinel Drive**View: Half Dome, Merced River*

The Sentinel Bridge is located at the intersection of Southside drive and Sentinel Drive. The bridge gives visitors views of Half Dome over the Merced River, and filtered views of the Upper Yosemite Falls to the west. The view of Half Dome in the reflected light of sunset over the river has been noted as being particularly dramatic. The current bridge was constructed in 1994, although this is likely the area of the first bridge over the Merced River in the Valley beginning in the 1860s. The state of California replaced James Hutching's timber bridge (that had replaced a previous bridge) with a steel bridge in 1878. This bridge was then replaced with a concrete span in 1919, and expanded in 1960. A conservative, definitive year to reference in the management of the vista is 1878, with the first steel bridge. Therefore any tree established before 1878 should not be removed.



**Figure H-18:** Sentinel Bridge. NPS 2009

Because of the vista's close ties to the river, it should be noted that no deciduous riparian species, or trees overhanging the river will be removed. There are numerous conifer saplings that should also be removed during the initial management of the vista.

The site was inventoried as part of the Scenic Vista Management Plan as site number 28. This site rated a high priority with an average VRA score of 13.5 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	-	11	23	5	8	47
Cedar	12	1	-	-	-	13
<b>Total</b>						<b>60</b>

RES-2-117

## Sentinel Bridge Parking (11.5-High)

*Location: Sentinel Drive**View: Yosemite Falls*

The Sentinel Bridge Parking area is located on the northern side of the Merced River adjacent to Sentinel Bridge on Sentinel Drive.

The current Sentinel Bridge Drive was constructed in 1956, bypassing the previous road from the previous bridge, across Cook's Meadow, to the falls. The vista dates to the time of the construction of the bridges in this location, and should be considered from the period of 1878. The current parking area, bus stop and walkways provide excellent opportunity to view Cook's Meadow and Yosemite Falls. The main vista from this location

is Yosemite Falls across Cook's meadow. The view of the meadow is as important as the view of the waterfall, and as a result the trees recommended for removal are conifers encroaching on the meadow.

The site was inventoried as part of the Scenic Vista Management Plan as site number 12. This site rated a high priority with an average VRA score of 11.5 out of 18.



**Figure H-19:** Sentinel Bridge Parking. NPS 2009

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	6	10	20	13	12	61
Cedar	-	-	10	1	-	11
<b>Total</b>						<b>72</b>



RES-2-097

## Housekeeping Bridge (8-Medium)

*Location: Housekeeping Camp*

*View: Yosemite Falls, Merced River*

The Housekeeping Bridge over the Merced River is adjacent to the Housekeeping Camp, located a half mile east of Sentinel Bridge. This bridge was constructed in 1929 and is a contributing structure to the Yosemite Valley Historic District. The primary vista is of Yosemite Falls, over the Merced River. There are a limited number of ponderosa pines in the middle ground, approximately 500 meters downstream that could grow taller and block the view in the future. It is recommended to monitor and manage this vista and remove the trees if necessary in the future. No trees established before 1929 should be removed.



**Figure H-20:** Housekeeping Bridge. NPS 2009

This vista is similar to the nearby vista inventoried at Housekeeping Beach. It is recommended to manage the bridge vista, and not the beach vista, because management actions would be identical.

The site was inventoried as part of the Scenic Vista Management Plan as site number 92. This site rated a medium priority with an average VRA score of 8 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<40" dbh	<50" dbh	TOTAL
Ponderosa	6	1	7
<b>Total</b>			<b>7</b>

RES-2-084

## Curry Amphitheater

(9.5-Medium)

*Location: Curry Village*

*View: Half Dome*

The Curry Amphitheater is located within Curry Village.

The current structure was built in 1953, although an amphitheater has been in this location since 1915. Views of Half Dome from within Curry Village are contributing vistas in the Yosemite Valley Historic District and the amphitheater is the most public area with a view that can be reestablished with the removal of a small number of trees. Trees established before 1915 should not be removed.



**Figure H-23:** Curry Amphitheater. NPS 2012

The site was inventoried as part of the Scenic Vista Management Plan as site number 46. This site rated a medium priority with an average VRA score of 9.5 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<20" dbh	<40" dbh	TOTAL
Ponderosa	-	2	2
Fir	1	-	1
Cedar	-	1	1
<b>Total</b>			<b>4</b>

RES-2-086

**Curry Village Parking**

(9.75-Medium)

*Curry Village**View: Half Dome*

The Curry Village Parking area is located adjacent to Curry Village. The parking lot was constructed in 1929 and was originally used as an ice skating rink during the winter months. There are a number of conifers at the east end of the lot that could block the view of Half Dome in the future, removal should be considered at that time. Trees established before 1929 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 27. This site rated a medium priority with an average VRA score of 9.75 out of 18.



**Figure H-24:** Curry Village Parking. NPS 2012

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<20" dbh	<40" dbh	TOTAL
Ponderosa	-	24	24
Cedar	6	-	6
<b>Total</b>			<b>30</b>

RES-2-122

**Stoneman Bridge**

(12-High)

*Northside Drive*

*View: North Dome, Merced River,  
Royal Arches*

The Stoneman Bridge is on Northside Drive north of Curry Village. Stoneman Bridge was constructed in 1932. Trees established before 1932 should not be removed.

The Stoneman Bridge site should be monitored and maintained. At this time, trees which are partially obscuring the vista are overhanging the river and providing shade to river habitat. It is unlikely that trees further



**Figure H-25:** Stoneman Bridge. NPS 2012

away would grow tall enough to cover the view of North Dome. The bridge is considered for removal. If the bridge is removed, the vista should not be maintained in the future.

The site was inventoried as part of the Scenic Vista Management Plan as site number 25. This site rated a high priority with an average VRA score of 12 out of 18.

## RES-2-123

### Stoneman Meadow Boardwalk

(13.5-High)

*Location: Happy Isle Loop Road*

*View: North Dome, Royal Arches, Washington's Column, Stoneman Meadow*

The Stoneman Meadow boardwalk is located at the intersection of Happy Isles Loop Road and Curry Village Road. The boardwalk gives visitors a panoramic view of the meadow and many other significant Yosemite landmarks such as Glacier Point, North Dome, Royal Arches, and Washington's Column. Half Dome can be seen in the distance to the east and Yosemite Falls can be seen in the distance to the west. The primary vista to manage at this site is the view to North Dome, Royal Arches and Washington's Column where conifers have encroached onto the edge of the meadow. The Happy Isles Loop was constructed in 1929 and trees established before 1929 should not be removed.



**Figure H-26:** Stoneman Meadow. NPS 2012

The site was inventoried as part of the Scenic Vista Management Plan as site number 6. This site rated a high priority with an average VRA score of 13.5 out of 18.

#### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	19	16	46	13	94
Cedar	36	12	15	3	66
<b>Total</b>					<b>160</b>



RES-2-082

## Clarks Bridge (8-Medium)

*Location: Happy Isle Loop Road*

*View: Yosemite Falls*

Clarks Bridge is west of the Concessioner Stables on Happy Isles Loop Road. It is a distant vista of Yosemite Falls down the Merced River. Large trees in the middle ground up to 600 meters away are recommended for removal. Clarks Bridge was constructed in 1928, so trees established before 1928 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 7. This site rated a medium priority with an average VRA score of 8 out of 18.



**Figure H-27:** Clark's Bridge. NPS 2012

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	-	6	14	17	2	39
Cedar	11	5	1	4	-	21
<b>Total</b>						<b>60</b>

RES-2-094

## Happy Isles Bridge (8.5-Medium)

*Location: Happy Isles Loop Road*

*View: North Dome, Merced River*

The Happy Isles Bridge is at the southeast point of Happy Isles Loop Road. Happy Isles Bridge was constructed in 1929, so trees established before 1929 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 14. This site rated a medium priority with an average VRA score of 8.5 out of 18.



**Figure H-28:** Happy Isles Bridge. NPS 2012

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	-	-	-	1	1
Cedar	8	2	-	-	10
Fir	11	2	1	3	17
<b>Total</b>					<b>28</b>

**RES-2-100****Illilouette View****(8.25-Medium)***Location: Mist Trail**View: Illilouette Falls*

Illilouette View is located on the Mist Trail between the trailhead at Happy Isles and the Vernal Falls Bridge. The trail on the south side of the river was built in 1885 by George Anderson, and reworked by the Park Service in 1928.

The vista is from a viewing area to Illilouette Falls. The view is almost completely blocked. The trees recommended for removal are on the opposite bank of the river. No trees should be removed that overhang the river, or established before 1928. No actions in wilderness areas will occur.

**Figure H-29:** Illilouette View. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 30. This site rated a medium priority with an average VRA score of 8.25 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Cedar	-	-	1	-	1	2
Fir	4	6	9	4	-	23
<b>Total</b>						<b>25</b>

## RES-2-130

**Vernal Fall Foot Bridge**

(7.25-Medium)

*Location: Mist Trail**View: Vernal Falls*

The Vernal Fall Foot Bridge is located on the mist trail approximately 0.75 miles from the Mist Trail trailhead. There has been a bridge near the base of the fall since one was constructed by the state of California in 1885. At present, there are conifers encroaching from the north, but these are within the Wilderness boundary, which is about 25 meters upstream from the bridge. No trees larger than 6" dbh are recommended for removal. This site should be monitored and maintained. There are small maple trees, outside of Wilderness, near the bridge that could be trimmed in the future to preserve a view to the fall.

**Figure H-30:** Vernal Fall Foot Bridge. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 29. This site rated a medium priority with an average VRA score of 7.25 out of 18.

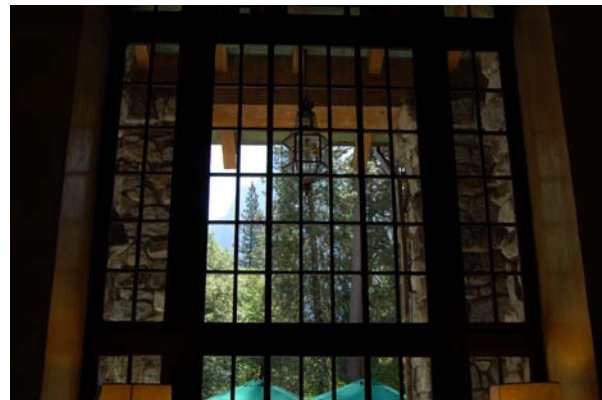
## RES-2-069

**Ahwahnee Lounge**

(11.25-High)

*Location: Ahwahnee Hotel, Royal Arches, North Dome, Washington's Column**View: Half Dome*

The Ahwahnee Dining Lounge is located within the historic Ahwahnee Hotel, a National Historic Landmark. The Ahwahnee Hotel was constructed in 1927 and the Lounge was sited to be a viewing lounge to the scenic wonders of Yosemite. Many areas of the hotel were aligned to take full and dramatic effect of the scenery. One of the dramatic views that have been obscured by conifers is to Half Dome from the Lounge. Trees in the middle ground up to 250 meters from the building are recommended for removal. Trees established before 1927 should not be removed for vista management.

**Figure H-33:** Ahwahnee Lounge. NPS 2012

The site was inventoried as part of the Scenic Vista Management Plan as site number 159. This site rated a high priority with an average VRA score of 11.25 out of 18.



**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	<60" dbh	TOTAL
Ponderosa	26	6	27	39	5	2	94
Cedar	45	66	10	-	1	-	122
<b>Total</b>							<b>216</b>

RES-2-073

**Ahwahnee Winter Club Room**

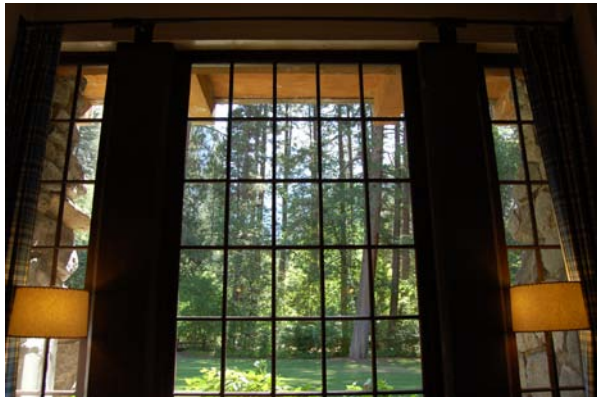
(9.5-Medium)

*Location: Ahwahnee Hotel*

*View: Royal Arches, North Dome, Washington's Column, Half Dome*

This vista is next to the Great Lounge, and falls within the same viewing corridor. This site should be monitored, and action should not be taken to block this view. No additional action should be taken at this location outside of managing the Ahwahnee Lounge vista.

The site was inventoried as part of the Scenic Vista Management Plan as site number 228. This site rated a medium priority with an average VRA score of 9.5 out of 18.



**Figure H-31:** Ahwahnee Winter Club Room. NPS 2012

RES-2-068

**Ahwahnee Dining Room**

(10.25-High)

*Location: Ahwahnee Hotel*

*View: Yosemite Falls*

The Ahwahnee Dining Room is within the historic Ahwahnee Hotel, a National Landmark. The large window at the end of the grand hall looks west to Yosemite Falls. It was intended to frame the dramatic view for the guests while dining.

The Ahwahnee Hotel was constructed in 1927, so trees established before this time should not be removed. This is the only vista which recommends removing California Black Oak. These trees are obscuring a view in which there is little opportunity for a viewer to move



**Figure H-32:** Ahwahnee Dining Room. NPS 2009



around. Trimming rather than removing would improve the current vista, but would likely need to be trimmed on an annual basis. Trees in the middle ground up to 500 meters from the window are recommended for removal.

The site was inventoried as part of the Scenic Vista Management Plan as site number 161. This site rated a high priority with an average VRA score of 10.25 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	56	26	48	23	3	156
Cedar	7	15	15	7	1	45
Black Oak	1	-	1	-	-	2
Live Oak	4	-	-	-	-	4
<b>Total</b>						<b>207</b>

RES-2-072

**Ahwahnee Solarium**

(8.75-Medium)

*Ahwahnee Hotel*

*View: Glacier Point*

The Ahwahnee Solarium is located at the south end of the Ahwahnee Hotel. The Ahwahnee Hotel was constructed in 1927, so no tree established before 1927 should be removed. Trees in the middle ground up to 300 meters from the building are recommended for removal.

The site was inventoried as part of the Scenic Vista Management Plan as site number 160. This site rated a medium priority with an average VRA score of 8.75 out of 18.



**Figure H-34:** Ahwahnee Solarium. NPS 2009

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	<60" dbh	TOTAL
Ponderosa	18	13	10	27	10	-	78
Cedar	14	29	5	4	1	1	54
<b>Total</b>							<b>132</b>

RES-2-157

# **Ahwahnee Hotel, front lawn** (10.25-High)

*Location: Ahwahnee Hotel*

*View: Yosemite Falls, Glacier Point*

The Ahwahnee Hotel Front Lawn is located at the southern end of the hotel. The vista is from the interpretive sign, looking toward Yosemite Falls.

The Ahwahnee Hotel was constructed in 1927, so no tree established before this time should be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 16. This site rated a high priority with an average VRA score of 10.25 out of 18.



**Figure H-35:** Ahwahnee Hotel Front Lawn. NPS 2009

## **MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	8	1	1	3	1	14
Cedar	-	1	-	1	-	2
Alder	-	trim	-	1	-	1
<b>Total</b>						<b>17</b>

RES-2-071

# **Ahwahnee Meadow** **Peeling Domes Sign** (11.5-High)

*Location: Northside Drive*

*View: North Dome, Royal Arches,  
Washington's Column, Half Dome*

The Ahwahnee Meadow is located on Northside Drive 0.5 miles from the intersection of Southside Drive. Northside Drive in its current configuration was constructed in 1928, so no trees established before this time should be removed. Removing this segment of Northside Drive is considered under the Merced River Plan. If the segment is removed, and no planned walkway replaces it in this area, the vista should not be monitored or maintained.



**Figure H-37:** Ahwahnee Meadow. NPS 2012

The site was inventoried as part of the Scenic Vista Management Plan as site number 227. This site rated a high priority with an average VRA score of 11.5 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<50" dbh	TOTAL
Ponderosa	4	4
<b>Total</b>		<b>4</b>

RES-2-081

## Church Bowl Picnic Area

(12-High)

*Location: Ahwahnee Drive*

*View: Half Dome*

The Church Bowl Picnic Area is located on Ahwahnee Drive 0.37 miles west of the Ahwahnee Hotel. A coach road along the north side of the valley was constructed in 1872, although the alignment of the current road is known with certainty to date from 1927. Trees established before this time should not be removed.

The rockfall hazard zone has recently been updated to include an area further away from the cliff face. As stated in the SVMP, large trees help buffer the impact, and potential damage, of rockfall by absorbing some of the force and rock debris. Most of the trees currently obscuring the view are outside of the rock fall zone, on the south side of the road and not effective in protecting any structure. No trees on the north side of the road within the rockfall hazard zone will be removed.



**Figure H-38:** Church Bowl Picnic Area. NPS 2012

The site was inventoried as part of the Scenic Vista Management Plan as site number 11. This site rated a high priority with an average VRA score of 12 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	<60" dbh	TOTAL
Ponderosa	80	6	12	6	6	4	114
Cedar	95	35	13	17	10	1	171
<b>Total</b>							<b>285</b>

RES-2-131

## Visitor Center Benches

(9.75-Medium)

Location: Ahwahnee Drive

View: Yosemite Falls

The Visitor Center Benches are in the plaza near the front entrance of the Yosemite Valley Visitors Center. The village was established with the construction of the Administration Building and the Museum, completed in 1926. Trees established before this time will not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 39. This site rated a medium priority with an average VRA score of 9.75 out of 18.



Figure H-39: Visitor Center Benches. NPS 2012

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<30" dbh	TOTAL
Fir	3	3
Total		3

RES-2-099

## Hutchings View B

(12-High)

View: Yosemite Falls

Location: Northside Drive

Hutchings View B is near the Yosemite Falls Shuttle Stop at the Hutchings interpretive sign. Trees were cleared from this vista in 2004 to open a viewing corridor for the upper and lower falls, along an axis to where the Old Hutchings View is located. Signs interpreting Hutchings contributions were created and placed near Northside Drive. The intention of this vista is to recall the vista as it appeared to Hutchings in 1859, but a conservative year adopted at the Old Hutchings View is 1928, when the layout of the adjacent roads was finalized. Yosemite Creek is adjacent to the vista point so riparian species should not be removed.



Figure H-40: Hutchings View B. NPS 2012



The site was inventoried as part of the Scenic Vista Management Plan as site number 158. This site rated a high priority with an average VRA score of 12 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	-	6	11	1	1	19
Cedar	30	5	6	2	1	44
Black Oak			Trim 4			
<b>Total</b>						<b>63</b>

**RES-2-141**

**Yosemite Falls View**

(8.75-Medium)

Location: Northside Drive

View: *Yosemite Falls*

Yosemite Falls View is northeast of The Yosemite Lodge. Trees were cleared as part of the Yosemite Falls approach project in 2005. The intention in managing this vista is to broaden the view to minimize future maintenance needs of trimming, and lessening the alley-like appearance of the trees on the approach to the falls. A conservative year to manage the vista from is 1928, when the circulation of the valley was generally set.



**Figure H-41:** Yosemite Falls View. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 18. This site rated a medium priority with an average VRA score of 8.75 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	-	1	8	11	2	22
Cedar	55	4	1	4	-	64
Fir	-	2	3	2	-	7
<b>Total</b>						<b>93</b>

RES-2-104

## Lower Falls Bridge

(10-High)

*Location: Lower Yosemite Falls Trail*

*View: Yosemite Falls*

The Lower Falls Bridge is near the base of the Yosemite Falls at the Lower Yosemite Falls Overlook. The vista is predominately open, but there are several cedars that could restrict the view in the future. These trees should be removed if they limit the view from the bridge. The bridge was built in 1920 and is a contributing structure to the Yosemite Valley Historic District. Trees established prior to 1920 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 48. This site rated a high priority with an average VRA score of 10 out of 18.



**Figure H-42:** Lower Falls Bridge. NPS 2009

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	TOTAL
Cedar	4	2	6
<b>Total</b>			<b>6</b>

RES-2-083

## Cook's Meadow, South Boardwalk

(8-Medium)

*Location: Sentinel Drive*

*View: Yosemite Falls*

The Cook's Meadow Boardwalk is located in the southwest corner of Cooks Meadow. This vista should be monitored and maintained, but no management actions removing trees larger than 6" dbh are recommended.

The site was inventoried as part of the Scenic Vista Management Plan as site number 2. This site rated a medium priority with an average VRA score of 8 out of 18.



**Figure H-43:** Cooks Meadow. NPS 2009

## RES-2-125

**Superintendents Bridge, flood sign  
(10.75-High)**

*View: North Dome, Royal Arches, Half Dome,  
Merced River*

The Superintendents Bridge is a footbridge south of the Old Superintendents House. The view to Half Dome is blocked by conifers. No riparian species should be removed in management of this vista.

The site was inventoried as part of the Scenic Vista Management Plan as site number 47. This site rated a high priority with an average VRA score of 10.75 out of 18.



**Figure H-44:** Superintendents Bridge. NPS 2009

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	-	3	13	1	17
Cedar	60	20	6	1	87
<b>Total</b>					<b>104</b>

## RES-2-142

**Yosemite Lodge Portico  
(9.5-Medium)**

*Location: Northside Drive*

*View: Yosemite Falls*

The Yosemite Lodge Portico is in front of the Registration Building at Yosemite Lodge. The Registration building was completed in 1959. Trees that were established prior to 1959 should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 19. This site rated a medium priority with an average VRA score of 9.5 out of 18.



**Figure H-45:** Yosemite Lodge Portico. NPS 2009

**MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<40" dbh	TOTAL
Ponderosa	5	5
Cedar	6	6
<b>Total</b>		<b>11</b>

RES-2-102

## Leidig Meadow, west

(11.75-High)

Location: Valley Loop Trail

View: North Dome, Washington's Column, Cathedral Arches, Half Dome, Sentinel Rock

The vista is on a trail that about 50 meters south of the Valley Loop trail at the west end of Leidig Meadow, about 1 mile west of the Yosemite Lodge. It is a remarkable point in which a visitor can see many of the Yosemite Valley's incredible geologic formations from one location, across a large meadow. The intention is to remove conifers encroaching in the meadow. It is difficult to assign a date to this location. Leidig Meadow has a long history of use including serving as the location for a US Army camp when the headquarters were moved to the Valley in 1906. The meadow was fenced for grazing shortly after, and at one point was the location of a horse race track. A conservative year from which the vista can be managed is 1928, when the circulation pattern in the valley was generally set.



**Figure H-46:** Leidig Meadow, west end. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 31. This site rated a high priority with an average VRA score of 11.75 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	4	5	4	6	19
<b>Total</b>					<b>19</b>



RES-2-139

**Wosky Pond**

(12.25-High)

Location: Northside Drive

View: Wosky Pond, Cathedral Rock, Cathedral Spires, Slaughterhouse Meadow

Wosky Pond is about 2 miles west of the Yosemite Lodge on Northside Drive. The view of Cathedral Rock from Northside Drive is listed as a contributing vista in the Yosemite Valley Historical District. This is one of the few areas along Northside Drive that has a vista which is generally unobstructed. The intent of managing this vista is to remove the conifers which are encroaching on the meadow. There are trees to the south of the Meadow could obscure the Spires in the future. The circulation in the Valley was generally set in 1928 and therefore no trees established before this time should be removed.

**Figure H-47:** Wosky Pond. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 42. This site rated a high priority with an average VRA score of 12.25 out of 18.

**MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	22	19	29	11	81
<b>Total</b>					<b>81</b>

RES-2-087

**Devil's Elbow**

(9-Medium)

Location: Southside Drive

View: El Capitan

Devil's Elbow is located 2.25 miles west of the Yosemite Lodge on Northside Drive. El Capitan looms over this area. It is unlikely trees will block the view from the trail just south of Northside Drive. No trees over 6" dbh should be removed at this time. This site should be monitored and maintained.

**Figure H-48:** Devil's Elbow. NPS 2009

The site was inventoried as part of the Scenic Vista Management Plan as site number 41. This site rated a medium priority with an average VRA score of 9 out of 18.

RES-2-088

## El Capitan Meadow

(14.5-High)

*Location: Southside Drive*

*View: El Capitan*

The El Capitan Meadow vista is in the northeastern portion of El Capitan Meadow. The vista includes a large portion of the Yosemite Valley with iconic natural landmarks such as El Capitan, The Three Brothers, Cathedral Rocks, and the Cathedral Spires. The viewpoint is part of the Yosemite Road Guide (marker V8). Views from Northside Drive to El Capitan are also listed as a contributing vista to the Yosemite Valley Historical District. The Meadow is a popular location for visitors to watch climbers ascending the Yosemite Valley walls. The Merced River Plan proposes constructing a boardwalk into the meadow. If a boardwalk is built, the vista should be managed from that location. No trees should be removed from within the rockfall hazard zone.



Figure H-49: El Capitan Meadow, east end. NPS 2009

Northside Drive in its current configuration was established by 1928; therefore trees established prior to this date should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 33. This site rated a high priority with an average VRA score of 14.5 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6" DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	TOTAL
Ponderosa	38	29	50	35	152
Cedar	38	38	18	-	94
Fir	-	-	1	-	1
Total					247

RES-2-076

## **Hanging Valley, Bridalveil Fall (14-High)**

*Location: Northside Drive*

*View: Bridalveil Falls, Merced River*

The Hanging Valley Viewpoint is on Northside Drive, approximately one mile west of El Capitan Crossover. The viewpoint gives visitors views across the Merced River to well-known Yosemite landmarks including Bridalveil Falls and the Leaning Tower. The viewpoint is part of the Yosemite Road Guide (marker V10) and is a contributing vista to the Yosemite Valley Historic District. The vista looks over a stand of California Black Oaks. The intention of managing this vista is to remove conifers encroaching into the oaks. Several trees will also be removed from the upper bank on the north side of the Merced River.



**Figure H-50:** Hanging Valley, Bridalveil Fall. NPS 2009

The current configuration of Northside Drive is in place by 1928, therefore trees established before this time should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 34. This site rated a high priority with an average VRA score of 14 out of 18.

### **MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION**

Tree Species	<12" dbh	<20" dbh	<30" dbh	TOTAL
Cedar	4	4	1	9
Ponderosa	4	5	5	14
<b>Total</b>				<b>23</b>

RES-2-128

## Valley View

(16-High)

Location: Northside Drive

View: Yosemite Valley

Valley View is at the west end of Northside Drive. This is the vista on the 2010 quarter from the US Mint's "America the Beautiful" series. The viewpoint is part of the Yosemite Road Guide (marker V11) which describes it as being a view of the "gates" of Yosemite with El Capitan on the left and Cathedral Rocks on the right. The landscape of the surrounding Yosemite Valley is reflected in the calm water of the Merced River. The primary objective in managing the vista is to open the mostly obscured view of Bridalveil Fall, and to reduce the number of conifers encroaching



Figure H-51: Valley View. NPS 2009

on the meadow. There are a large number of dead trees from a controlled burn in 2007. The area from which trees will be removed is approximately 4 acres. There are 117 snags within this area, and of these, those less than 12" dbh will be removed and larger snags of greater habitat value will remain.

Northside Drive in its current configuration was in place by 1928. Therefore trees established before this time should not be removed.

The site was inventoried as part of the Scenic Vista Management Plan as site number 146. This site rated a high priority with an average VRA score of 16 out of 18.

### MAXIMUM NUMBER OF TREES OVER 6"DBH REMOVED AT THIS LOCATION

Tree Species	<12" dbh	<20" dbh	<30" dbh	<40" dbh	<50" dbh	TOTAL
Ponderosa	12	66	36	47	14	175
Cedar	102	98	73	48	6	327
Fir	-	5	9	3	-	17
<b>Total</b>						<b>519</b>

### SNAGS TO REMOVE

Tree Species	<12" dbh	TOTAL
Ponderosa	3	3
Cedar	102	102
<b>Total</b>		<b>105</b>

### SNAGS TO REMAIN

Tree Species	<20" dbh	<30" dbh	TOTAL
Ponderosa	3	2	5
Cedar	7	-	7
<b>Total</b>			<b>12</b>

**TABLE H-1: SITES INVENTORIED, BUT NO MANAGEMENT OR MAINTENANCE ACTIONS RECOMMENDED**

Code	SVMP Inventory	VRA score	Priority	Name	Notes
--	1	12.25	HIGH	Residence One	relocated - MRP common to all
RES-2-070	10	10.5	HIGH	Ahwahnee Meadow, Northside Drive	do not manage - similar to 227
--	17	12	HIGH	Hutchings View A	do not manage – similar to 158
--	36	10.25	HIGH	Valley View, old Big Oak Flat	do not manage – near wilderness
RES-2-079	40	10.25	High	Cathedral Beach	do not manage – similar to 226
RES-2-085	224	9.75	MEDIUM	Curry Village Ice Skating Rink	do not manage – not in historic location, proposed removal in MRP
RES-2-096	26	9.75	MEDIUM	Housekeeping Beach	do not manage - similar to 92
RES-2-110	169	9.75	MEDIUM	Old Wawona Road (point 3)	do not manage - near wilderness
RES-2-112	164	9.75	MEDIUM	Old Wawona Road (point 5)	do not manage – near wilderness
RES-2-077	43	9.5	MEDIUM	Bridalveil Meadow	Do not manage – duplicate
RES-2-113	162	9.25	MEDIUM	Old Wawona Road (point 6)	do not manage – near wilderness
RES-2-111	165	9	MEDIUM	Old Wawona Road (point 4)	do not manage – near wilderness
--	170	8.75	MEDIUM	Old Wawona Road (point 2)	do not manage – near wilderness
RES-2-108	171	8.75	MEDIUM	Old Wawona Road (point 1)	do not manage – near wilderness
RES-2-114	163	7.75	MEDIUM	Old Wawona Road (point 7)	do not manage – near wilderness
RES-2-090	21	8.5	MEDIUM	El Capitan postage stamp beach	do not manage - similar to 3
RES-2-140	230	0	LOW	Yosemite Falls Trail	do not manage - erroneous point
RES-2-089	91	0	LOW	El Cap Meadow, east end	do not manage - duplicate
RES-2-103	234	0	LOW	Leidig Meadow, west end	do not manage - duplicate
RES-2-133	57	7	LOW	Wawona Hotel	do not manage – low priority score
RES-2-105	178	7	LOW	Nevada Fall Bridge	do not manage – low priority score
RES-2-129	180	7	LOW	Vernal Fall	do not manage – low priority score
--	8	7	LOW	Lamon Orchard	do not manage – low priority score

**TABLE H-1: SITES INVENTORIED, BUT NO MANAGEMENT OR MAINTENANCE ACTIONS RECOMMENDED (CONTINUED)**

Code	SVMP Inventory	VRA score	Priority	Name	Notes
RES-2-124	90	7	LOW	Sugar Pine Bridge	do not manage – low priority score
RES-2-067	89	6.75	LOW	Ahwahnee Bridge	do not manage – low priority score
RES-2-074	4	6.5	LOW	Black Spring	do not manage – low priority score
RES-2-105	179	6.5	LOW	Nevada Fall	do not manage – low priority score
RES-2-101	181	6.25	LOW	Lady Franklin Rock	do not manage – low priority score
--	13	5.5	LOW	Happy Isles, interpretive sign	do not manage – low priority score
RES-2-132	56	5.25	LOW	Wawona golf course, south end	do not manage – low priority score
RES-2-066	59	5	LOW	Texas Turnout	do not manage – low priority score
RES-2-138	60	4.25	LOW	Panetta's turnout	do not manage – low priority score
RES-2-136	61	4.25	LOW	Mosquito Creek helispot	do not manage – low priority score
RES-2-137	62	4.25	LOW	North of Mosquito helispot	do not manage – low priority score
RES-2-134	63	4.25	LOW	Chain control point, north of Wawona	do not manage – low priority score
RES-2-135	58	3.5	LOW	Turnout north of Chilnualna Falls Road	do not manage – low priority score

## **APPENDIX I**

### **YOSEMITE VALLEY HISTORIC DISTRICT RESOURCES**

## APPENDIX I

### YOSEMITE VALLEY HISTORIC DISTRICT RESOURCES

The natural features particularly important to the overall significance and integrity of the historic district.

- Upper Yosemite Fall
- Lower Yosemite Fall
- Bridalveil Fall
- Nevada Fall
- Vernal Fall
- El Capitan
- Cathedral Range
- Three Brothers
- Sentinel Rock
- Yosemite Point
- Lost Arrow
- Royal Arches
- Glacier Point
- Washington Column
- Half Dome
- North Dome

**Contributing buildings (28) in the Yosemite Valley historic district (valley-wide) are listed below.**

B1 Yosemite Valley Chapel, built 1879, moved 1901 (Listed in NR, 1973)

B2 Le Conte Memorial Lodge, 1903, moved 1919 (Listed in NR 1977; NHL, 1987)

B3 Concessioner Stables Office, 1927

B4 Concessioner Horse Stable, 1927

B5 Concessioner Mule Barn, 1926

B6 Concessioner Stables Linen Building, 1927 An asterisk (\*) next to the building number indicates previously listed resources.

B7 Concessioner Stables Tack Building, 1927

B8 Concessioner Stables Harness Shop, 1927

B9 Concessioner Stables Blacksmith Shop, 1927

B10 Concessioner Stables Comfort Station, 1927

B11 Concessioner Stables Pony Tack Shed #1, 1926

B12 Concessioner Stables Pony Tack Shed #2, 1926

B13 Concessioner Stables Employee Residence, 1927

B14-B18 5 Concessioner Stables Employee Cabins, 1927

B19 Vernal Fall Comfort Station, 1934

B20-B27 8 Comfort Stations in Upper and Lower River campgrounds (Camps 15, 7), 1922- 1924

B28 Nature Center at Happy Isles (Fish hatchery, 1927)

**Contributing structures (39) in the valley-wide area are listed below.**

S1 Pohono Bridge, 1928; Listed in NR 1977

S2 Gauging Station at Pohono Bridge, 1916

S3 Valley Loop Trail, 1920s

S4 Bridalveil Fall Access Road

S5 Bridalveil Fall Trail



S6-S8 3 Bridalveil Fall Trail Bridges No.1-3, 1913  
S9 El Capitan Bridge, 1933  
S10 El Capitan Transverse Road  
S11 Northside Drive, 1880s  
S12 Southside Drive, 1880s  
S13 Superintendent's Footbridge, 1937  
S14 Yosemite Creek Bridge, 1922; Listed in NR in 1977  
S15 Lower Yosemite Fall Trail  
S16-21 6 Yosemite Fall Trail Bridges  
S22 Housekeeping Footbridge, 1929  
S23 Sentinel Bridge Transverse Road  
S24 Stoneman Bridge 1932; Listed in NR 1977  
S25 Ahwahnee Bridge 1928; Listed in NR 1977  
S26 Sugar Pine Bridge 1928; Listed in NR 1977  
S27 Clark's Bridge, 1928; Listed in NR 1977  
S28 Eastern Portion of Loop Drive  
S29 Mirror Lake Road  
S30 Tenaya Creek Bridge, 1928; Listed in NR in 1977  
S31 New Happy Isles Bridge, 1929; Listed in NR in 1977  
S32 Happy Isles Middle Bridge, 1997 reconstruction  
S33 Happy Isles West Bridge, 1997 reconstruction  
S34 Mist Trail, 1858  
S35 Four Mile Trail, 1872/1928  
S36 Concessioner Stables Corral, 1927  
S37 Concessioner Stables Feeders, 1927  
S38 Concessioner Stables Fence, 1927  
B39 Yosemite Fall Trail, 1888

**Contributing sites (13) in the Yosemite Valley historic district are listed below.**

Site 1 Bridalveil Meadow  
Site 2 El Captain Meadow  
Site 3 Slaughterhouse Meadow  
Site 4 Sentinel Meadow  
Site 5 Leidig Meadow  
Site 6 Cook's Meadow  
Site 7 Ahwahnee Meadow  
Site 8 Stoneman Meadow  
Site 9 Hutchings Orchard  
Site 10 Lamon Orchard and Meadow (Listed in the NR in 1975)  
Site 11 Fern Springs  
Site 12 Mirror Lake  
Site 13 Camp 4 (Sunnyside Campground; Listed in 2003)

**Contributing buildings (138) in the Yosemite Village developed area are listed below.**

- B1 Superintendent's House (1911/1929; Residence No. 1; Listed in NR in 1978)
- B2 Superintendent's Garage
- B3 Yosemite Village Residence 2, 1911, moved to Yosemite Village in 1929
- B4 Yosemite Village Residence 3, 1937
- B5 Yosemite Village Residence 4, 1911, moved to Yosemite Village in 1929
- B6 Yosemite Village Residence 5, 1912, moved to Yosemite Village in 1929
- B7 Yosemite Village Residence 6, 1920
- B8 Yosemite Village Residence 7, 1920/1939
- B9 Yosemite Village Residence 8, 1920/1939
- B10 Yosemite Village Residence 9, 1922
- B11 Yosemite Village Residence 10, 1922
- B12 Yosemite Village Residence 11, 1924
- B13 Yosemite Village Residence 12, 1922
- B14 Yosemite Village Residence 13, 1914, moved to Yosemite Village in 1929
- B15 Yosemite Village Residence 14, 1924/1938
- B16 Yosemite Village Residence 16, 1923, rehabilitated 1926
- B17 Yosemite Village Residence 17, 1926
- B18 Yosemite Village Residence 18, 1919
- B19 Yosemite Village Residence 19, 1919
- B20 Yosemite Village Residence 20, 1918
- B21 Yosemite Village Residence 21, 1919
- B22 Yosemite Village Residence 34, 1930
- B23 Yosemite Village Residence 35, 1938
- B24 Yosemite Village Residence 36, 1937
- B25 Yosemite Village Residence 37, 1938
- B26 Yosemite Village Residence 39, 1927
- B27 Yosemite Village Residence 40, 1927
- B28 Yosemite Village Residence 41, 1937
- B29 Yosemite Village Residence 42, 1928
- B30 Yosemite Village Residence 43, 1928
- B31 Yosemite Village Residence 44, 1929
- B32 Yosemite Village Residence 45, 1929
- B33 Yosemite Village Apartment Building 46, 1930
- B34 Yosemite Village Residence 47, 1931
- B35 Yosemite Village Residence 48, 1931
- B36 Yosemite Village Girls' Dormitory 54, 1923
- B37 Yosemite Village Girls' Dormitory 55, 1923
- B38 Yosemite Village Girl's Club, 1923
- B39 Yosemite Village Girls' Dormitory 58, 1932
- B40 Yosemite Village Girls' Dormitory 59, 1932
- B41 Yosemite Village Apartment Building 60, 1934
- B42 Yosemite Village Residence 61, 1934
- B43 Yosemite Village Residence 62, 1934

B44 Yosemite Village Residence 63, 1934  
B45 Yosemite Village Residence 66, 1940  
B46 Yosemite Village Residence 67, 1940  
B47 Yosemite Village School Residence 636, 1928  
B48 Yosemite Village Residence 637, 1937  
B49 Yosemite Village Garage for Residence 636, 1937  
B50 Yosemite Village Garage for Residence 3, 1938  
B51 Yosemite Village Garage for Residence 48, 1933  
B52 Yosemite Village Garage for Residence 43, 1929  
B53 Yosemite Village Garage for Residence 41, 1927  
B54 Yosemite Village Garage for Residence 40, 1919  
B55 Yosemite Village Garage for Residence 45, 1933  
B56 Yosemite Village Garage for Residence 14, 1924  
B57 Yosemite Village Garage for Residence 12, 1922  
B58 Yosemite Village Garage for Residence 11, 1927  
B59 Yosemite Village Garage for Residence 6, 1924  
B60 Yosemite Village Woodshed for Residence 21, 1919  
B61 Yosemite Village Woodshed for Residence 19, 1919  
B62 Yosemite Village Woodshed for Residence 8, 1920  
B63 Museum Building, 1926  
B64 Administration Building, 1924  
B65 Rangers' Club, 1920  
B66 Rangers' Club Transformer House, 1920  
B67 Rangers' Club Garage, 1920  
B68 Best Studio & Ansel Adams Darkroom, ca. 1925  
B69 Ansel Adams Residence, ca. 1925  
B70 Ansel Adams Duplex Residence, ca. 1925  
B71 Pohono Indian Studio, 1925  
B72 Yosemite Village US Post Office, 1924  
B73 Yosemite Valley Group Utility Building (Fort Yosemite), 1935  
B74 Yosemite Valley Utility Area Equipment Shed (HVAC-Siberia Storage), 1932  
B75 Yosemite Valley Utility Area Camp 1 Comfort Station, 1924  
B76 Yosemite Valley Utility Area Camp 1 Kitchen, ca. 1920  
B77 Yosemite Valley Utility Area Camp 1 Cabin #1, 1923  
B78 Yosemite Valley Utility Area Camp 1 Cabin #2, 1923  
B79 Yosemite Valley Utility Area Warehouse (529 and 532), 1916  
B80 Yosemite Valley Utility Area Supply Warehouse (530), 1916  
B81 Yosemite Valley Utility Area Equipment Shed (516), 1921  
B82 Yosemite Valley Utility Area Equipment Shed (518), 1920  
B83 Yosemite Valley Utility Area Equipment Shed (519), 1926  
B84 Middle Tecoya Residence 126, 1942  
B85 Middle Tecoya Residence 127, 1942  
B86 Middle Tecoya Residence 128, 1942  
B87 Middle Tecoya Residence 129, 1942  
B88 Middle Tecoya Residence 130, 1942

B89 Middle Tecoya Residence 131-132, 1942  
B90 Middle Tecoya Residence 133, 1942  
B91 Middle Tecoya Residence 134-135, 1942  
B92 Middle Tecoya Residence 136, 1942  
B93 Middle Tecoya Residence 139, 1942  
B94 Middle Tecoya Garage for Residence, ca. 1942  
B95 Middle Tecoya Garage for Residence, ca. 1942  
B96 Middle Tecoya Garage for Residence, ca. 1942  
B97 Lewis Memorial Hospital (Medical Clinic), 1929  
B98 Nurses' Quarters and Garage, 1931  
B99 Yosemite Village Residence 49, Doctor's Residence, 1931  
B100 Yosemite Village Residence 65, 1939  
B101 Lower Tecoya Dormitory A & B, 1930s  
B102 Lower Tecoya Dormitory C & D, 1920s  
B103 Lower Tecoya Dormitory E, 1930s  
B104 Lower Tecoya Dormitory F, 1920s or 1930s  
B105 Lower Tecoya Dormitory Y, 1920s  
B106 Lower Tecoya Residence 119, 1925-1930  
B107 Lower Tecoya Residence 118, 1925-1930  
B108 Lower Tecoya Residence 117, 1925-1930  
B109 Lower Tecoya Residence 116, 1925-1930  
B110 Lower Tecoya Residence 115, 1925-1930  
B111 Lower Tecoya Residence 114, 1925-1930  
B112 Lower Tecoya Residence 113, 1920  
B113 Lower Tecoya Residence 112, 1922-1924  
B114 Lower Tecoya Residence 111, 1920  
B115 Lower Tecoya Residence 110, 1922-1924  
B116 Lower Tecoya Residence 109, 1922-1924  
B117 Lower Tecoya Residence 108, 1922-1924  
B118 Lower Tecoya Residence 107, 1920  
B119 Lower Tecoya Residence 105/106, 1920s  
B120 Lower Tecoya Residence 103/104, 1920s  
B121 Lower Tecoya Residence 101/102, 1925-1930  
B122 Lower Tecoya Residence 100, ca. 1920s-1930s  
B123 Lower Tecoya Residence 99, ca. 1920s-1930s  
B124 Lower Tecoya Residence 98, ca. 1920s-1930s  
B125 Lower Tecoya Residence 92-97, 1925-1930  
B126 Lower Tecoya Residences 86-91, 1925-1930  
B127 Lower Tecoya Laundry Cabin, 1930s  
B128-B132 Lower Tecoya Garages, 1920s-1930s  
B133 Concessioner Headquarters Building, 1937-1939  
B134 Curry Garage (Concessioner Garage), 1920  
B135-B138 4 Garages north of Curry Garage, 1920s

**Fourteen (14) structures contributing to the Yosemite Village developed area are listed below.**

S1 Village Drive (between junction with Northside Drive and Village bike path), Listed in NR in 1978  
S2 Road between Village Drive and Maintenance Area  
S3 Roads and alleys in Yosemite Village Residential Area, Listed in NR in 1978  
S4 Middle Tecoya Road  
S5 Lower Tecoya Road  
S6 Ahwahnee Meadow Road Pedestrian Path  
S7-S10 4 Bridges over Indian Canyon Creek  
S11 Lower Tecoya Footbridge  
S12 Rangers' Club Parking Area  
S13 Yosemite Valley Medical Clinic Road and Parking Area  
S14 Yosemite Valley Medical Clinic Paths

**Contributing sites (1) in the Yosemite Village area are listed below.**

Site 1 Yosemite Pioneer Cemetery

**Contributing buildings (10) in the Ahwahnee Hotel developed area are listed below.**

B1 Ahwahnee Hotel, 1927, Listed in NR 1977, Designated NHL 1987  
B2-B9 8 Ahwahnee Hotel Guest Cottages, 1928  
B10 Ahwahnee Hotel Guest Cottage Linen Building

**Contributing structures (11) in the Ahwahnee Hotel developed area are listed below.**

S1 Ahwahnee Hotel Entry Road (from gateway to parking lot)  
S2 Ahwahnee Hotel Gate Lodge and Post  
S3 Ahwahnee Hotel Parking Area (West)  
S4 Ahwahnee Hotel Fish Pond  
S5 Ahwahnee Hotel Paths Leading to Guest Cottages  
S6 Ahwahnee Hotel Footbridge to Guest Cottages  
S7 Ahwahnee Hotel Footbridge near Merced River  
S8 Ahwahnee Hotel Bridle Trail Ford  
S9 Ahwahnee Hotel Drainageways  
S10 Ahwahnee Hotel Tennis Courts  
S11 Ahwahnee Hotel Terrace

**Contributing buildings (126) in the Camp Curry developed area are listed below.**

B1 Camp Curry Registration Office (now Lounge), 1904, Camp Curry Historic District listed in NR in 1979)  
B2 Camp Curry Post Office (now Registration Office), 1920  
B3 Camp Curry Stoneman House (now Lodge), 1913  
B4 Camp Curry Huff House, 1923  
B5-B50 46 Camp Curry Cabins Without Baths (WOBs), singles and duplexes, 1928-1935

B51-B56 5 Camp Curry Comfort Stations and 1 Camp Curry Employee Kitchen/Shower Building in tent and cabin areas

B57-B103 47 Camp Curry Duplexes with Baths (Bungalows), 1918-1922

B104 Camp Curry Mother Curry Bungalow, 1917

B105 Camp Curry Foster Curry Cabin, 1916

B106 Camp Curry Stoneman Cabin (Cottage 819), 1923

B107 Camp Curry Cabin 90 A/B (Rufus Green Bungalow), 1920s

B108-B109 2 Camp Curry Comfort Stations in the ice rink area, 1930s

B110 Camp Curry Bike Shop/Skate Rental Building, 1920-1940

B111-126 Camp Curry Employee Cabins (Boys Town Cabins), 1930

**Contributing structures (547) in the Camp Curry area are listed below.**

S1-S427 427 Camp Curry Canvas Cabins (Guest Cabins) (year 2000 number; number has varied over the years)

S428-S469 42 Camp Curry Employee Canvas Cabins (Terrace Tent Cabins) (year 2000 number)

S470-S542 73 Camp Curry Employee Canvas Cabins (Boys Town Tent Cabins) (year 2000 number)

S543 Camp Curry Pedestrian Paths

S544 Camp Curry Bungalow Roads

S545 Camp Curry Entrance Sign, 1914

S546 Camp Curry Electrical Transformer Structure, 1920

S547 Two-story Storage Structure (in Cabins without Baths area)

**Contributing sites (2) in the Camp Curry area are listed below.**

Site 1 Walls and foundations of original LeConte Memorial Lodge

Site 2 Curry Orchard Parking Area

## **APPENDIX J**

### **NHPA ASSESSMENT OF EFFECT FOR SITE-SPECIFIC ACTIONS**

## APPENDIX J

### NHPA COMPLIANCE REPORT

Appendix J is intended to provide a complete record of compliance with Section 106 of the National Historic Preservation Act. This includes how consultation was conducted, properties identified in the area of potential effects, and an assessment of effect on historic properties in more detail than that provided in the EIS. This document includes a list of all historic properties and the determination of effect anticipated under the preferred alternative (Alternative 5). Resolution of adverse effects would be addressed consistent with 36 CFR Part 800.6 and 800.11, and would require continued consultation with SHPO, ACHP and traditionally-associated American Indian tribes and groups.

#### **36 CFR PART 800.3 INITIATION OF THE SECTION 106 PROCESS**

Planning for the Merced Wild and Scenic River has been carried out in consultation with state, federal, and local agencies; the public; and tribes and groups associated with the Merced Wild and Scenic River corridor. Consistent with 36 CFR Part 800.3(b) and 36 CFR Part 800.8, the review process for Section 106 of the NHPA is being conducted in coordination with the NEPA review process for the Merced River Plan/DEIS. Public involvement will continue throughout the planning process. Please read Chapter 10 of Volume 2b for further details on consultation and coordination.

#### ***Culturally Associated American Indian Tribes and Groups***

The NPS is consulting with traditionally associated American Indian tribes and groups throughout the development of the *Merced River Plan/DEIS*. Yosemite National Park currently maintains consultation relationships with seven American Indian tribes and groups that claim traditional cultural association with park lands and resources. This includes five federally recognized American Indian tribes (Bridgeport Paiute Indian Colony of California, Bishop Paiute Tribe, North Fork Rancheria of Mono Indians of California, Picayune Rancheria of the Chukchansi Indians, and the Tuolumne Band of Me-Wuk Indians), and two American Indian groups (American Indian Council of Mariposa County, Inc. [also known as the Southern Sierra Miwuk Nation] and the Mono Lake Kutzadika<sup>a</sup>). Consultation with federally-recognized American Indian tribes takes place on a government-to-government basis.

In December 2009, Yosemite requested tribal participation in the Merced Wild and Scenic River Plan. The NPS formally requested information from culturally associated tribes and groups for the protection of traditional cultural resources and historic properties with traditional cultural or religious significance. Tribal consultation included regularly scheduled and special meetings, as well as tribal site visits. Comments received from traditionally associated American Indian tribes and groups have been considered throughout the planning process. Yosemite officials will continue to consult with culturally associated tribes and groups throughout the EIS implementation process and will work directly with appropriate tribal government officials when plans or activities could have direct or indirect effects on traditional cultural resources, tribal interests, practices, traditional use areas and/or



sacred sites. **Table J-1** outlines tribal consultation meetings for the *Merced River Plan/DEIS* since July 2007.

The Yosemite National Park American Indian Consultation Program facilitates regulatory compliance with the National Historic Preservation Act; the National Environmental Policy Act; the Native American Graves Protection and Repatriation Act; and other statutes, policies, and guidance related to American Indian resources, issues, and concerns. The NPS will continue to conduct formal and informal consultations with traditionally-associated American Indian tribes and groups about proposed NPS plans and actions that have the potential to affect the treatment, use, and access to cultural and natural resources with documented or potential cultural meaning for those groups.

**TABLE J- 1. TRIBAL CONSULTATION MEETINGS THROUGH DEC. 1, 2012**

Merced Wild & Scenic River Comprehensive Management Plan/EIS Tribal Consultation Meetings (as of Dec. 1, 2012)			
Date	Meeting	Location	Participants with the NPS
July 2007	Annual All Tribes Meeting	Tuolumne Lodge, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , American Indian Council of Mariposa County (AICMC), Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians
July 2008	Annual All Tribes Meeting	Wawona Hotel Sunroom, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians
July 2009	Annual All Tribes Meeting	Tuolumne Lodge, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians, Bridgeport Indian Colony, North Fork Rancheria of Mono Indians of California
July 2010	Annual All Tribes Meeting	Yosemite Lodge, Yosemite	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians, Bridgeport Indian Colony, North Fork Rancheria of Mono Indians of California
February 2011	Quarterly Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
August 2011	Annual All Tribes Meeting	Wawona Hotel, Yosemite	Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of Chukchansi Indians, Tuolumne Band of Me-Wuk Indians, North Fork Rancheria of Mono Indians of California
September 2011	Monthly Tribal Council Meeting, AICMC	Mariposa	AICMC Tribal Council
December 2011	Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
January 2012	Monthly Wahhoga Meeting	Mariposa	Wahhoga Committee
February 2012	Monthly Wahhoga Meeting	Mariposa	Wahhoga Committee
March 2012	Quarterly Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
March 2012	Quarterly Consultation Meeting	North Fork Rancheria of Mono Indians of California	North Fork Rancheria of Mono Indians of California Tribal Council
July 13, 2012	Annual All Tribes Meeting	Lee Vining	Bishop Paiute Tribe, Mono Lake Kudzadika <sup>a</sup> , AICMC, Picayune Rancheria of the Chukchansi Indians, Tuolumne Band of Me-Wuk, North Fork Rancheria of Mono Indians of California
July 17, 2013	Tribal Site Visit	Yosemite Valley	AICMC, Tuolumne Band of Me-Wuk Indians
Aug. 14, 2012	Tribal Site Visit	El Portal	AICMC, Tuolumne Band of Me-Wuk Indians
Aug.27, 2012	Quarterly Consultation Meeting	Tuolumne Band of Me-Wuk, Rancheria	Tuolumne Band of Me-Wuk Cultural Committee
Nov. 7, 2012	Tribal Site Visit	Yosemite Valley	AICMC

### ***California State Historic Preservation Officer***

The California State Office of Historic Preservation is responsible for administering federal- and state-mandated historic preservation programs to protect California's irreplaceable archaeological and historical resources. Consultation takes place under the direction of the State Historic Preservation Officer, a gubernatorial appointee. The NPS initiated consultation with the State Historic Preservation Office regarding the *Merced River Plan/DEIS* in June 2007. This consultation was initiated under the terms of the *1999 Programmatic Agreement among the National Park Service at Yosemite, the California State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP) Regarding Planning, Design, Construction, Operations, and Maintenance, Yosemite National Park, California* (1999 PA). The SHPO requested that consultation regarding the *Merced River Plan/DEIS* occur per the standard four-step process (per 36 CFR Part 800). In August 2012, the park agreed that consultation under the standard consultation process outlined in 36 CFR Part 800 would provide a more deliberative vehicle to address the plan's Section 106 compliance.

Yosemite met with the State Historic Preservation Officer on June 13, 2012, to discuss the planning effort, ORVs, and potential properties affected. On July 11, 2012, the SHPO visited the park and select historic properties potentially affected by the plan. In September 2012, the SHPO and other consulting parties participated in a conference call to discuss draft criteria for the historic resources component of the cultural ORV. Comments submitted by SHPO were considered in the development of the historic resources component of the cultural ORV.

### ***Advisory Council on Historic Preservation***

Yosemite initiated consultation with Advisory Council on Historic Preservation (ACHP) in May 2008 by notifying the agency that the park intended to prepare an Environmental Impact Statement (EIS) to comply with NHPA's Section 106. In August 2012, the NPS received a request from the ACHP to participate in the Merced River Plan as a consulting party from that point forward per 36 CFR Part 800.2(b). Consultation with ACHP will continue throughout the development of the plan-specific programmatic agreement, and through implementation of the plan as stipulated in the programmatic agreement.

### ***National Trust for Historic Preservation and the Historic Bridges Foundation***

Consistent with 36 CFR Part 800.2(a)(4), the NPS formally initiated consultation with the National Trust for Historic Preservation (NTHP) on August 28, 2012, and the Historic Bridges Foundation (HBF) on August 23, 2012 following their requests for consulting party status. The NTHP and HBF are included on the project's mailing list, participated in relevant meetings in June, July, and September 2012 and were sent hard copies of public review documents and notification of public involvement opportunities. Additionally, these representatives from these organizations were included in focused discussions regarding the historic resources ORV in June, July, and September 2012.

### **36 CFR PART 800.4: IDENTIFICATION OF HISTORIC PROPERTIES**

The proposed area of potential effects (APE) for the Merced River Plan is larger than the area encompassed by the proposed river boundary, to ensure that the effects of all actions are thoroughly considered. More specifically, the APE extends out 1.5 miles on each side of the river channel and includes those archeological and historic districts that extend beyond the ¼-mile river corridor.

Table J-2 lists all the listed and eligible properties in the APE. A number of cultural resources in the APE have not been evaluated for eligibility to the National Register. These resources are not listed in Table J-2 or analyzed in this document as they require evaluation and determination of eligibility, and assessment of effect prior to implementation of specific actions associated with the preferred alternative. Follow up compliance on particular projects will require phased identification and comprehensive evaluation of these resources per 36 CFR Part 800.4(b) and 800.4(c). Specific details of this phased process will be described in the plan-specific programmatic agreement which will be completed prior to the signing of the final decision document.

The percentage of archeological survey coverage varies by river segment. This coverage ranges from 70% in Yosemite Valley to 10% of the wild segment above Wawona. Additional subsurface testing for archeological resources may be necessary prior to implementation of particular actions.

Unevaluated or ineligible sites may have religious and cultural significance not recognized through the NHPA process. The plan proposes to determine the eligibility and document the Yosemite Valley as a Traditional Cultural Property (or a portion thereof), consisting of traditional use areas, spiritual places and historic village sites as a necessary action to protect and enhance the ethnographic component of the cultural ORV in this river segment. Consultation with American Indian tribes and groups is ongoing and may result in solutions that improve conditions of important places and practices. Proposed treatment for all actions that may affect resources which may be of religious and cultural significance would involve close consultation with traditionally-associated American Indian tribes and groups to ensure these treatments considered their concerns.

**TABLE J- 2. LIST OF HISTORIC PROPERTIES WITHIN THE AREA OF POTENTIAL EFFECTS**

<b>NATIONAL REGISTER LISTED OR ELIGIBLE PROPERTIES</b>	<b>Property Type</b>	<b>NR Status</b>	<b>Date</b>
Acting Superintendent's Headquarters (1978000362)	Building	Listed	06/09/78
The Ahwahnee Hotel (1977000149: NHL)	Building	Listed	02/15/77
Bagby Stationhouse (1979000316)	Building	Listed	04/13/79
Buck Creek Cabin	Building	Eligible	8/23/04
Camp 4 (2003000056)	Site	Listed	2/21/03
Camp Curry Village Historic District (1979000315)	District	Listed	11/01/79
Chris Jorgenson Studio (1979000280)	Building	Listed	04/13/79
El Portal Hotel	Building	Eligible	02/08/99
El Portal Historic Structures	Site	Eligible	02/08/99
El Portal Murchison House	Building	Eligible	02/08/99
El Portal Old Schoolhouse	Building	Listed	02/01/11
Glacier Point Road Historic District	District	Eligible	9/27/07
Glacier Point Trailside Museum (1978000375)	Building	Listed	04/04/78
Hetch Hetchy Railroad Engine No. 6 (1978000360)	Structure	Listed	01/30/78
Hodgdon Homestead Cabin (1978000356)	Structure	Listed	06/09/78
Le Conte Memorial Lodge (197700148: NHL)	Structure	Listed	3/8/77
Mariposa Grove	District	Eligible	8/25/04
Mariposa Grove Museum (1978000381)	Building	Listed	12/01/78
McCauley Barn (1978000353)	Building	Listed	06/15/78
Merced Canyon Travel Corridor Historic District	District	Eligible	7/97
Merced Lake High Sierra Camp Historic District	District	Eligible	8/23/04
Merced Lake Ranger Station	Building	Eligible	8/23/04
National Lead Company	Building	Eligible	02/08/99
National Lead Company Residence Bldgs. No. 703 704 705	Building	Eligible	02/08/99
New Big Oak Flat Road	Structure	Eligible	8/23/04
Old Big Oak Flat Road	Structure	Eligible	8/23/04
Old Coulterville Road and Trail	Structure	Eligible	03/15/78
Pioneer Yosemite History Center	District	Eligible	09/06/11
Rangers' Club (1987001414: NHL)	Building	Listed	5/28/87
Substation and Substation Control House No. 1	Building	Eligible	3/7/95
Track Bus No. 19 ( 1978000363)	Object	Listed	5/22/78
Wawona Covered Bridge (2006001261)	Structure	Listed	1/11/07
Wawona Tunnel	Structure	Eligible	8/23/04
Wawona Hotel and Pavilion (1975000223: NHL)	District	Listed	10/1/75
Yosemite Hydroelectric Powerplant	Structure	Eligible	02/24/82
Yosemite Transportation Company Office (1978000355)	Building	Listed	06/09/78
Yosemite Valley Bridges Historic District (1977000160)	District	Listed	11/25/77

<b>NATIONAL REGISTER LISTED OR ELIGIBLE PROPERTIES</b>	<b>Property Type</b>	<b>NR Status</b>	<b>Date</b>
Yosemite Valley Chapel (1973000256)	Building	Listed	12/12/73
Yosemite Valley Historic District (2004001159)	District	Listed	12/14/06
Yosemite Valley Railroad Caboose No. 15 (1978000352)	Object	Listed	05/22/78
Yosemite Valley Railroad Residences	Structures	Eligible	02/08/99
Yosemite Village Historic District (1978000354)	District	Listed	3/30/78
		Amended	1/12/95
<b>NATIONAL HISTORIC LANDMARKS</b>	<b>Property Type</b>	<b>NHL Status</b>	<b>Date</b>
The Ahwahnee (1977000149)	Building	Listed	5/28/87
LeConte Memorial Lodge (1977000148)	Building	Listed	5/28/87
Rangers' Club (1987001414)	Building	Listed	5/28/87
Wawona Hotel and Thomas Hill Studio (1975000223)	District	Listed	5/28/87
<b>ARCHEOLOGICAL DISTRICTS</b>	<b>Property Type</b>	<b>NR Status</b>	<b>Date</b>
Eagle Peak Archeological District	District	Eligible	05/20/80
El Portal Archeological District (1978000359)	District	Listed	08/18/78
Mariposa Grove Archeological District	District	Eligible	05/20/80
Wawona Archeological District	District	Eligible	12/07/78
Yosemite Valley Archeological District (1978000361)	District	Listed	01/20/78
<b>ARCHEOLOGICAL SITES (A detailed list of these resources is available upon request.)</b>			
Prehistoric	329 sites		
Historic	70 sites		
Both	73 sites		
Total Archeological Sites	472 Sites		

### 36 CFR PART 800.5: ASSESSMENT OF ADVERSE EFFECTS

The assessment of effect in this document is organized by property within each river segment so that the number and kind of actions that may affect each resource can be assessed. Following 36 CFR Part 800.5, adverse effects are defined as those that “alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.”

A complete list of historic properties, proposed actions, and assessment of effect is included in Table J-2. The list below highlights potential adverse effects to components of historic properties that are proposed for removal or relocation in the preferred alternative:

Sugar Pine Bridge, 1928 – This bridge is proposed for removal under the preferred alternative in order to protect and enhance free-flowing condition of the river. The historic Sugar Pine Bridge is constricting the free-flowing condition of the Merced River and causing severe localized impacts to hydrologic function. While some other bridges in Yosemite Valley also constrict flow, the severe

impacts of Sugar Pine Bridge are due in part to its location at the upstream reach of an oxbow. This bridge is a contributor to the Yosemite Valley Bridges Historic District, the Yosemite Valley Historic District, and is a component of the Yosemite Valley Historic Resources ORV. The plan calls for documentation of the historic resource prior to removal, and interpretation of the bridge and the rationale for its removal. (Alternative 6 proposes to improve riverbank condition at Sugar Pine Bridge by increasing channel complexity through construction of constructed log jams, strategic placement of large wood, removal of rip rap, and bioengineering of the riverbank. This alternative specifies that if subsequent monitoring of riparian condition reveals insufficient protection of the free-flowing condition of the river within 10 years of the implementation of these actions, more aggressive management action may be initiated, including the possible removal of Sugar Pine Bridge.)

Ahwahnee Tennis Courts, c. 1930s – The Ahwahnee tennis courts, built after the initial construction of the hotel, would be removed in order to restore the earlier historic setting of the Ahwahnee Meadow and associated black oak woodland. This action was called for in the 1980 General Management Plan. The tennis courts are components of The Ahwahnee National Register nomination, the Yosemite Valley Historic District but are not included in The Ahwahnee NHL nomination or the Yosemite Valley Historic Resources ORV. The Ahwahnee Meadow is a contributor to the Yosemite Valley Historic District. Requirements for documentation and interpretation of the resource and restoration of the surrounding area are described in the Ahwahnee Cultural Landscape Report. Additional details will be determined through consultation and the plan-specific programmatic agreement.

Camp Curry Employee Cabins (Boys Town Cabins), 1930 – The 72 historic tent cabins and 14 historic cabins without bathrooms in this location are proposed for removal in the preferred alternative in order to replace the cabins with 98 hard-sided units with bathrooms. These historic cabins are contributors to the Yosemite Valley Historic District but not the Camp Curry Historic District. Employee housing in this area would be discontinued, and replaced with permanent housing units in the Huff House area. (Huff House is also a contributor to the Yosemite Valley Historic District.) This action would provide year-round lodging accommodations in Curry Village. Requirements for documentation and interpretation of the resources prior to removal will be determined through consultation and detailed in the plan-specific programmatic agreement.

Concessioner Headquarters Building, 1937-1939 – This building is a contributor to the Yosemite Valley Historic District but not the Yosemite Village Historic District. The preferred alternative proposes to remove the building and its function out of the river corridor. This action would address the WSRA requirement to reduce development in the river corridor that is not necessary for major public uses, in addition to allowing for the Yosemite Village Day-Use Parking Area to be moved northward out of the 150-foot riparian buffer. Requirements for documentation and interpretation of the resources prior to removal will be determined through consultation and detailed in the plan-specific programmatic agreement.

Curry Garage (Concessioner Garage) and 4 garages north of Curry Garage, 1920 – These buildings are contributors to the Yosemite Valley Historic District but not the Yosemite Village Historic District. The preferred alternative proposes to remove the buildings and their functions out of the river corridor. This action would address the WSRA requirement to reduce development in the river corridor that is not necessary for major public uses, in addition to allowing for the Yosemite Village

Day-Use Parking Area to be moved northward out of the 150-foot riparian buffer. Requirements for documentation and interpretation of the resources prior to removal will be determined through consultation and detailed in the plan-specific programmatic agreement.

Northside Drive, 1880s – Under the preferred alternative, Northside Drive would be re-routed to the south of the Yosemite Village Day-use Parking Area. This segment of roadway contributes as a structure and as a component of the circulation pattern in the Yosemite Valley Historic District. A traffic circle at Northside Drive/Village Drive would be constructed to address traffic congestion and pedestrian/vehicle conflicts. This action will allow the Yosemite Village Day-Use Parking Area to be moved northward out of the 150-foot riparian buffer.. Requirements for documentation and interpretation of the resources prior to removal will be determined through consultation and detailed in the plan-specific programmatic agreement.

Superintendent's House and Garage (Residence 1), 1911/1929 – The preferred alternative proposes to relocate the residence and garage to a new location in the Yosemite Valley NPS housing area. This action would address the WSRA requirement to reduce development in the river corridor that is not necessary for major public uses, and will protect the historic structure from recurring flooding. This action was called for in the 1980 General Management Plan. The residence and the garage were listed as contributors to the Yosemite Valley Historic District and Yosemite Village Historic District, and are included in the Yosemite Valley Historic Resources ORV. The plan calls for documentation of the historic property prior to removal, and interpretation of the property and the rationale for its removal. (Alternative 6 proposes to rehabilitate the Superintendent's House and Garage (Residence 1) per Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (2012) in its existing location. This will preserve the historic fabric while preparing the structure to withstand periodic flooding. Contrary to Alternative 6 which includes “selective riverbank restoration”, the preferred alternative removes infrastructure in the 100-year floodplain to the maximum extent possible.)

Due to the sensitive and confidential nature of archeological resources, the complete table and the determination of effects anticipated under the preferred alternative have been withheld from this document. Section 304 of NHPA requires federal agencies, or other public officials receiving grant assistance under the NHPA, to “withhold from disclosure to the public, information about the location, character, or ownership of a historic resource. . .” if the agency and the Secretary of the Interior agree that its release may (1) cause a significant invasion of privacy, (2) risk harm to the historic resource, or (3) impede the use of a traditional religious site by practitioners. In all cases, the park will consider effects to archeological resources in planning and avoid and/or mitigate effects wherever possible.

Locations of resources of religious and cultural significance are also protected under Section 304 of NHPA and thus the site-specific analysis of effects anticipated under the preferred alternative have been withheld from this document. The Yosemite Valley Historic District refers in very general terms to resources of religious and cultural significance to traditionally-associated American Indian tribes and groups. Beyond these general references, there are currently no listed or eligible historic properties within the APE. However, because resources of religious and cultural significance are mentioned in the Yosemite Valley Historic District nomination, currently-documented traditional use



areas are analyzed for adverse effects in compliance with NHPA. The plan proposes to determine the eligibility document the Yosemite Valley as a Traditional Cultural Property (or a portion thereof), consisting of traditional use areas, spiritual places and historic village sites as a necessary action to protect and enhance the ethnographic component of the cultural ORV in this river segment. Consultation with American Indian tribes and groups is ongoing and may result in solutions that improve conditions of important places and practices.

## All River Segments

**TABLE J- 3. ASSESSMENT OF EFFECTS FOR ACTIONS IN ALL RIVER SEGMENTS**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
Abandoned infrastructure	RES-AS-001 - Removal of abandoned underground infrastructure.	Pending additional analysis	
<b>Archeological resources</b>			
Confidential site location information withheld.			
<b>Traditional Use Areas of Religious and Cultural Significance</b>			
Confidential site location information withheld.			

## Segment 1

**TABLE J- 4. ASSESSMENT OF EFFECTS FOR ACTIONS IN SEGMENT 1**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
Merced Lake High Sierra Camp Historic District	ONA-1-003 - The reduction of the number of beds at the Merced Lake High Sierra Camp to 11 units (of an original 22)	No adverse effect	Reduction of beds will not result in the loss of contributing resources
<b>Archeological resources</b>			
None of the archeological sites in Segment 1 are listed, or have been determined to be eligible for the National Register of Historic Places.			
<b>Traditional Use Areas with Religious and Cultural Significance</b>			
None have been identified to date.			

## Segment 2

**TABLE J- 5. ASSESSMENT OF EFFECTS FOR ACTIONS IN SEGMENT 2**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
Yosemite Valley Historic District (2004001159)	RES-2-151 - Restoring the impacted portion of Ahwahnee Meadow to natural meadow conditions, through removal of tennis courts, irrigation, ditches, and restoration of topography	Adverse effect	Both the Ahwahnee Meadow and tennis courts are contributing features to the Yosemite Valley Historic District. Removal of the tennis courts will be an adverse effect  Restoration of the meadow will have no adverse effect
	FAC-2-010 - Retaining the existing facilities and services at the Ahwahnee Hotel, and the removal of the swimming pool	No adverse effect	The swimming pool is a non contributing features to the Yosemite Valley Historic District.
	RES-2-008, RES-2-011, RES-2-012, RES-2-151, RES-2-153, TRAN-2-013 - Ecological restoration of Cook's, Sentinel, Ahwahnee, Stoneman Meadows	No adverse effect	Cook's, Sentinel, Ahwahnee, Stoneman Meadows are contributors to the Yosemite Valley Historic District.
	RES-2-068, RES-2-069, RES-2-070, RES-2-072, RES-2-075, RES-2-076, RES-2-077, RES-2-079, RES-2-080, RES-2-083, RES-2-087, RES-2-088, RES-2-091, RES-2-098, RES-2-099, RES-2-116, RES-2-117, RES-2-128 - Removal of encroaching conifers from Ahwahnee, El Capitan, Bridalveil, Cook's, and Sentinel meadows	No adverse effect	Ahwahnee, Bridalveil, Cook's, El Capitan, and Sentinel Meadows are contributors to the Yosemite Valley Historic District.
	TRAN-2-014 - Redesign and formalize the existing parking lot at the Ahwahnee Hotel	No Adverse Effect	
	TRAN-2-001 - Relocation of parking to the north of the road and re-routing Northside Drive south of the parking at Camp 6	Adverse effect	Northside Drive is a contributing resource to the Yosemite Valley Historic District. Rerouting of Northside Drive will be an adverse effect  Relocation of parking will have no adverse effect

Resources	Action	Effect	Comments
<b>Historic resources</b>			
Yosemite Valley Historic District (2004001159) continued	FAC-2-002 - Repurposing the Government Utility Building building and rehabilitating Buildings 516, 518, and 519; six non-historic outbuildings would be removed or relocated; Law Enforcement operations and Valley Utilities would remain; a new roads and trails maintenance building would be built including four (4) vehicle bays with support functions.	Pending additional analysis	Government Utility building and rehabilitating Buildings 516, 518, and 519 are all contributing resources to the Yosemite Valley Historic District. Construction of 4 vehicle bays would have possible adverse effect.  Adapting the for a new use would be consistent with the Secretary of the Interior's Standards for Rehabilitation to the greatest extent possible. This
			could avoid or minimize the potential for adverse effects. Rehabilitation of Buildings 516, 518, and 519 would have no adverse effect
	ONA-2-004 - Expansion of Camp 4 eastward to provide 35 walk-in sites	No adverse effect	Camp 4 is a contributing resource to the Yosemite Valley Historic District.
	TRAN-2-017 and TRAN-2-016 - Construction of a Shuttle Bus stop near Camp 4, and the establishment of a new parking lots for Camp 4 campground	No adverse effect	Camp 4 is a contributing resource to the Yosemite Valley Historic District
	FAC-2-012 - In Yosemite Lodge area, the removal of the NPS volunteer office, Yosemite Lodge housing (Thousands Cabins), Housing at Highland Court, Yosemite Lodge Post Office, Yosemite Lodge Pool and Snack Stand	Pending additional analysis	
	FAC-2-016 - Replacement of temporary employee housing at Huff House with 16 permanent buildings	Possible adverse effect	Huff House is a contributing resource to the Yosemite Valley Historic District, but not the Camp Curry Historic District
	FAC-2-011 - Removal of services at the ice skating rink at Curry Village	No adverse effect	The ice skating rink is a non-contributing resource to the Yosemite Valley Historic District, although the associated Camp Curry Bike Shop/Skate Rental Building is a contributor to the Yosemite Valley Historic District.
	FAC-2-015, TRAN-2-011, TRAN-2-021 - Construction of additional housing or facilities and redesign or repurposing of existing facilities at Yosemite Lodge	No adverse effect	Determination of Effect for Yosemite Lodge may determine adverse effect, pending additional analysis

*Assessment of Effect for Site-Specific Actions on  
Cultural Resources in Alternative 5 (Preferred Alternative)*

Resources	Action	Effect	Comments
<b>Historic resources</b>			
Yosemite Valley Historic District (2004001159) continued	RES-2-009, RES-2-014, RES-2-020, RES-2-037 - Restoration of El Captain Meadow	No adverse effect	El Captain Meadow is a contributor to the Yosemite Valley Historic District.
	RES-2-005 and RES-2-029 - Rerouting the Valley Loop Trail, including the construction of boardwalks through sensitive habitat in Slaughterhouse Meadow	Possible adverse effect	Valley Loop Trail and Slaughterhouse Meadow are contributors to the Yosemite Valley Historic District.
	RES-2-053 - Engineer solutions, such as installation of large wood or culverts to Northside Drive, would be installed at Stoneman Bridge	No adverse effect	Stoneman Bridge is a contributor to the Yosemite Valley Historic District.
	RES-2-052 - Removal of Sugar Pine Bridge and restoration to natural conditions	Adverse effect	Sugar Pine Bridge is a contributor to the Yosemite Valley Historic District and Yosemite Valley Bridges Historic District.
	FAC-2-018 - Stabilization of Residence 1 (the Superintendent's House) and garage per the Secretary of the Interior's Standards for the Treatment of Historic Properties. Will happen in addition to relocation of buildings.	Adverse effect	Residence 1 is a contributor to the Yosemite Village Historic District.
	FAC-2-017, TRAN-2-009, ONA-2-010, ONA-2-011, ONA-2-005, ONA-2-016, ONA-2-012 - Construction of additional housing or facilities, including actions such as increased parking at Lost Arrow and West Valley Overflow, and camping at Upper Pines and the former Lower River Campground	Pending additional analysis	
	RES-2-008 and TRAN-2-007 - Formalization of the Curry Orchard Day Use Parking area	Adverse effect	Curry Orchard Parking area is a contributor to the Yosemite Valley Historic District.
	ONA-2-021 - Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.	Adverse effect	73 historic employee canvas cabins and 14 hard-sided cabins at Boys Town are contributors to the Yosemite Valley Historic District.
	TRAN-2-020 - relocation and formalization of the parking to the north of the road and re-routing Northside Drive south of the parking at Yosemite Village Day-use Parking Area	Adverse effect	Northside Drive and the circulation patterns at this location are contributors to the Yosemite Valley Historic District.
Yosemite Valley Historic District (2004001159) continued	TRAN-2-001 - The construction of a traffic circle at Northside Drive and Village Drive (Yosemite Village Day-use Parking Area intersection)	Adverse effect	Northside Drive and the circulation patterns at this location are contributors to the Yosemite Valley Historic District

Resources	Action	Effect	Comments
<b>Historic resources</b>			
	RES-2-150 - Relocation of Residence 1 (the Superintendent's House) to the NPS housing area	Adverse effect	Residence 1 is a contributor to the Yosemite Village Historic District; relocation would also affect existing housing area, also a part of Yosemite Village Historic District
	RES-2-023 - Removal of 34 units from Housekeeping Camp	Pending additional analysis	
	FAC-2-015 - Construction of new employee housing or parking in the vicinity of Yosemite Lodge	Pending additional analysis	
The Ahwahnee Hotel (1977000149: NHLS)	RES-2-151 - Restoring the impacted portion of Ahwahnee Meadow to natural meadow conditions, through removal of tennis courts, irrigation, ditches, and restoration of topography.	Adverse effect	Both the Ahwahnee Meadow and tennis courts are contributing features to the Ahwahnee Hotel NR and the Yosemite Valley Historic District. The tennis courts are not contributors to the NHL.  Removal of the tennis courts will be an adverse effect restoration of the meadow will have no adverse effect
	FAC-2-010 - Retaining the existing facilities and services at the Ahwahnee Hotel, and the removal of the swimming pool	No adverse effect	The swimming pool is a non contributing feature to the Ahwahnee Hotel NR and NHL.
	TRAN-2-014 - Redesign and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking. Follow Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration	No adverse effect	
Ditches*	RES-2-001 - Fill 2,155' of ditches throughout Segment 2 not serving current operational needs	Possible adverse effect	Pending additional analysis
Camp 4 (2003000056)	ONA-2-004 - Expansion of Camp 4 eastward to provide 35 walk-in sites	No adverse effect	
	TRAN-2-017 and TRAN-2-016 - Construction of a Shuttle Bus stop near Camp 4, and the establishment of a new parking lots for Camp 4 campground	No adverse effect	

*Assessment of Effect for Site-Specific Actions on  
Cultural Resources in Alternative 5 (Preferred Alternative)*

Resources	Action	Effect	Comments
<b>Historic resources</b>			
	TRAN-2-016 - In place of the old gas station, establish a new 41-space parking lot for Camp 4 campground. Additionally, construct a new 25-space overflow parking lot on the south side of Northside Drive.	No adverse effect	
Yosemite Lodge*	FAC-2-012 - In Yosemite Lodge area, the removal of the NPS volunteer office, Yosemite Lodge housing (Thousands Cabins), Housing at Highland Court, Yosemite Lodge Post Office, Yosemite Lodge Pool and Snack Stand	Pending additional analysis	
	FAC-2-015 - Construct two new concessioner housing areas housing 104 employees (26 in each structure/double occupancy). Construct 78 employee parking spaces in the vicinity of Yosemite Lodge	Pending additional analysis	
Yosemite Valley Bridges Historic District (1977000160)	RES-2-053 - Engineer solutions, such as installation of large wood or culverts to Northside Drive, would be installed at Stoneman Bridge, Clark's Bridge, Sentinel Bridge, Sentinel Bridge, and Superintendent's Bridge	No adverse effect	Stoneman Bridge is a contributor to the Yosemite Valley Bridges Historic District.
	RES-2-052 - Removal of Sugar Pine Bridge and restoration to natural conditions	Adverse effect	Sugar Pine Bridge is a contributor to the Yosemite Valley Bridges Historic District.
Yosemite Village Historic District	TRAN-2-001 - The construction of a traffic circle at Northside Drive and Village Drive at Camp 6	Adverse effect	Village Drive is a contributor to the Yosemite Village Historic District
Merced Canyon Travel Corridor Historic District	RES-2-065 - Pave and formalize 5 roadside pull-outs for river access between Pohono Bridge and the intersection of the Big Oak Flat Road. Install curbing. Completely remove one pull-out that is not protective of resources. Install drainage improvements and head walls at 11 locations.	Pending additional analysis	
<b>Archeological resources</b>			
<b>Confidential site location information withheld.</b>			
<b>Traditional Use areas with Religious and Cultural Significance</b>			
<b>Confidential location information withheld.</b>			

### Segment 3

**TABLE J- 6. ASSESSMENT OF EFFECTS FOR ACTIONS IN SEGMENT 3**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
Merced Canyon Travel Corridor Historic District	RES-3-001 Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock.	Pending additional analysis	
<b>Archeological resources</b>			
<b>Confidential site location information withheld.</b>			
<b>Traditional Use Area with Religious and Cultural Significance</b>			
None identified to date.			

### Segment 4

**TABLE J- 7. ASSESSMENT OF EFFECTS FOR ACTIONS IN SEGMENT 4**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
El Portal Historic Structures	FAC-4-004 - construction of additional concessioner housing in the Rancheria area of El Portal	Pending additional analysis	
El Portal Historic Structures	construction of 12 infill housing units in vacant lots in old El Portal	Pending additional analysis	
El Portal Historic Structures	FAC-4-002 - The removal or relocation of 36 existing private residences in Abbieville or Trailer Village areas	Pending additional analysis	
<b>Archeological resources</b>			
<b>Confidential site location information withheld.</b>			
<b>Traditional Use Area with Religious and Cultural Significance</b>			
None identified to date.			

### Segment 5

**TABLE J- 8. ASSESSMENT OF EFFECTS FOR ACTIONS IN SEGMENT 5**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
None identified to date.			
<b>Archeological resources</b>			
<b>Confidential site location information withheld.</b>			
<b>Traditional Use Area with Religious and Cultural Significance</b>			
None identified to date.			

## Segment 6

**TABLE J- 9. ASSESSMENT OF EFFECTS FOR ACTIONS IN SEGMENT 6**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
None identified to date.			
<b>Archeological resources</b>			
<b>Confidential site location information withheld.</b>			
<b>Traditional Use Areas with Religious and Cultural Significance</b>			
None identified to date.			

## Segment 7

**TABLE J- 10. ASSESSMENT OF EFFECTS FOR ACTIONS IN SEGMENT 7**

Resources	Action	Effect	Comments
<b>Historic resources</b>			
Historic Buildings in Wawona	Construct a 4,500 square foot building and grounds maintenance facility, a 6,800 square foot combined structural and wild land fire station, and a 4,000 square foot roads maintenance facility, and rehabilitate the existing California Conservation Corp (CCC) structures for potential re-use	Pending additional analysis	
Community of Wawona	removal of shoulder and off-road parking	No adverse effect	
Community of Wawona	redesign of the bus stop at Wawona	No adverse effect	
Wawona Hotel and Pavillion Historic District	Following the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Main Hotel, Manager's Cottage, and Annex Building, and Clark Cottage to bring the building to "good" condition would have no adverse effect on historic resources	No adverse effect	Action intended to protect Historic Resources
<b>Archeological resources</b>			
<b>Confidential site location information withheld.</b>			
<b>Traditional Use Areas with Religious and Cultural Significance</b>			
None identified to date.			

## 36 CFR 800.6: RESOLUTION OF ADVERSE EFFECT

To comply with Section 106 under the standard four-step process, the park is working with ACHP, SHPO, traditionally-associated American Indian tribes and groups, and other consulting parties to develop a plan-specific programmatic agreement regarding the implementation of the *Merced River Plan/DEIS*. This programmatic agreement is being developed concurrently with this plan and will be included as an appendix of the final plan. Parties to this agreement include the ACHP, the State Historic Preservation Officer, traditionally-associated American Indian tribes and groups, the National Trust for Historic Preservation, and the Historic Bridges Foundation. Consultation with these groups will continue throughout plan development and implementation.



## **APPENDIX K**

### **MANAGEMENT CONSIDERATIONS AND ACTIONS**

APPENDIX K  
MANAGEMENT CONSIDERATIONS AND ACTIONS

Action Code	Segment	Project Name	Issue Statement	Common To All	Alternative 1 ( No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
ONA-1-001	1	Little Yosemite Valley Camping Area	Crowding at Little Yosemite Valley designated camping area impacts Wilderness character and the Wilderness experience integral to the Recreation ORV in this segment.		Little Yosemite Valley designated camping area and associated infrastructure includes composting toilet and bear boxes.	Discontinue designated camping at Little Yosemite Valley camping area, and remove infrastructure, including composting toilet. Allow dispersed camping in this area.	Discontinue designated camping at Little Yosemite Valley camping area, and remove infrastructure, and retain composting toilet. Allow dispersed camping in this area.	Decrease the designated camping area at Little Yosemite Valley; retain composting toilet.	Continue designated camping at Little Yosemite Valley camping area. Retain infrastructure, such as composting toilet.	Continue designated camping at Little Yosemite Valley camping area. Retain infrastructure, such as composting toilet.
ONA-1-002	1	Merced Lake Backpackers Camping Area	Levels of use in the Merced Lake Zone affect Wilderness character and the Wilderness experience integral to the Recreation ORV in this segment.		Infrastructure at the Merced Lake Backpackers Camping Area includes designated camping area, a water system with flush toilets, and bear boxes for food storage.	Discontinue designated camping at the Merced Lake Backpackers Camping Area. Allow dispersed camping in the areas of the former Merced Lake Backpackers Camping Area and the Merced Lake High Sierra Camp; remove flush toilets and waste-water system.	Discontinue designated camping at the Merced Lake Backpackers Camping Area. Allow dispersed camping in the areas of the former Merced Lake Backpackers Camping Area and portions of the Merced Lake High Sierra Camp; replace flush toilets with composting toilet and remove waste-water system.	Expand Merced Lake Backpackers Camping Area, which is designated camping, into the area of former Merced Lake High Sierra Camp; replace flush toilets with composting toilet and remove waste-water system.	Retain location of the Merced Lake Backpackers Camping Area as a designated camping area. Replace flush toilets with composting toilet.	Retain location of the Merced Lake Backpackers Camping Area as a designated camping area. Replace flush toilets with composting toilet.
ONA-1-003	1	Merced Lake High Sierra Camp: Lodging	Merced Lake High Sierra Camp affects Wilderness character and the Wilderness experience integral to the Recreation ORV in this segment and is a visual impact on the Scenery ORV.		There are 22 units (60 beds) at Merced Lake High Sierra Camp.	Close Merced Lake High Sierra Camp and allow dispersed camping at Merced Lake Backpackers Camping Area into the High Sierra Camp footprint. Convert area to designated Wilderness.	Convert Merced Lake High Sierra Camp to a temporary pack camp with a maximum of 15 people allowed. Remove all permanent infrastructure. Convert area to designated Wilderness.	Close Merced Lake High Sierra Camp and restore the area to natural conditions. Area would be converted to designated Wilderness.	Retain the Merced Lake High Sierra Camp, reducing the capacity to 11 units (42 beds). Replace the flush toilets with composting toilet.	Retain the Merced Lake High Sierra Camp, keeping 22 units (60 beds). Replace the flush toilets with composting toilet.
ONA-1-004	1	Moraine Dome Camping Area	Requiring people to camp in designated camping areas in the Wilderness impacts the experience of unconfined recreation.		Moraine Dome designated camping area offers would maintain its current location and function.	Discontinue designated camping at Moraine Dome. Allow dispersed camping in this area.	Discontinue designated camping at Moraine Dome. Allow dispersed camping in this area.	Continue designated camping at Moraine Dome.	Continue designated camping at Moraine Dome.	Continue designated camping at Moraine Dome.
ONA-1-005	1	Wilderness Zone Capacity within the River Corridor	Encounter rates on trails between Little Yosemite Valley and Merced Lake indicate wilderness experience integral to Recreation ORV in this segment is temporally and spatially impacted.		The Wilderness trailhead quota system is managed by backcountry zone capacities and related trailhead quotas.	Manage to a capacity of 25 in the Little Yosemite Valley Zone using a zone quota or zone pass through system. All other zone capacities within the Merced WSR Corridor remain the same.	Manage to a capacity of 75 in the Little Yosemite Valley Zone using a zone quota or zone pass through system. All other zone capacities within the Merced WSR Corridor remain the same.	Manage to a capacity of 100 in the Little Yosemite Valley Zone using a zone quota or zone pass through system. All other zone capacities within the Merced WSR Corridor remain the same.	All zone capacities within the Merced WSR Corridor remain the same.	All zone capacities within the Merced WSR Corridor remain the same.
RES-1-001	1	Special-status plants affected by trails	Trails through sensitive habitats may directly and indirectly affect special status plants.	Re-route trails out of sensitive habitats through wetlands. New trail routes should avoid wetlands and special status habitat.	Trails through sensitive habitats have direct and indirect affect on special-status plants.	(CTA) Re-route trails out of sensitive habitats through wetlands. New trail routes should avoid wetlands and special-status habitat.	(CTA) Re-route trails out of sensitive habitats through wetlands. New trail routes should avoid wetlands and special-status habitat.	(CTA) Re-route trails out of sensitive habitats through wetlands. New trail routes should avoid wetlands and special-status habitat.	(CTA) Re-route trails out of sensitive habitats through wetlands. New trail routes should avoid wetlands and special-status habitat.	(CTA) Re-route trails out of sensitive habitats through wetlands. New trail routes should avoid wetlands and special-status habitat.
RES-1-002	1	Merced Lake East Meadow near the Merced Lake Ranger Station Meadow: grazing	The Merced Lake East Meadow near the Merced Lake Ranger Station Meadow has impacts from grazing such as heavily grazed vegetation, roll pits, manure, and trampled soils leading to a localized adverse impact on the meadow.		The Merced Lake East Meadow near the Merced Lake Ranger Station Meadow reflects high levels of bare ground and trampling associated with high levels of administrative pack stock grazing.	Remove the Merced Lake East Meadow from grazing permanently. Require all administrative pack stock passing through the Merced Lake area to carry pellet feed.	Develop preliminary grazing capacities for the Merced Lake East Meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed.	Remove the Merced Lake East Meadow from grazing permanently. Require all administrative pack stock passing through the Merced Lake area to carry pellet feed.	Develop preliminary grazing capacities for the Merced Lake East Meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed.	Develop preliminary grazing capacities for the Merced Lake East Meadow. When the meadow recovers, allow administrative grazing at established capacities. Monitor annually for five years, adapting use levels as needed.
RES-1-003	1	Merced Lake Shore Meadow: informal trails	Informal trails in Merced Lake Shore Meadow, adjacent the Merced High Sierra Camp, fragments meadow habitat and stunts vegetation lining the lake shore.	Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants.	There is a network of informal trails in Merced Lake Shore Meadow, adjacent to the Merced High Sierra Camp.	(CTA) Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants.	(CTA) Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants.	(CTA) Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants.	(CTA) Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants.	(CTA) Remove informal trails, decompact soils, fill ruts with native soils, and revegetate denuded areas with native plants.

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RES-1-004	1	Special status plants: trail impacts	Sections of trails in Wilderness or foot traffic deviating from these trails impact special status plants or sensitive habitat. These include wetlands in Echo Valley; a mineral spring outflow between Merced Lake and Washburn Lake; the wet section of the Mist Trail; and along high traffic sections of the John Muir Trail.	Relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Harden the trail along the wet sections of the Mist Trail to avoid trail widening. Prevent trail creep along the John Muir Trail using fencing and boardwalks.	There are impacts on special status plants or associated habitat associated with trails and foot traffic in wetlands in Echo Valley; a mineral spring outflow between Merced Lake and Washburn Lake; the wet section of the Mist Trail; and along high traffic sections of the John Muir Trail.	(CTA) Relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Harden the trail along the wet sections of the Mist Trail to avoid trail widening. Prevent trail creep along the John Muir Trail using fencing and boardwalks.	(CTA) Relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Harden the trail along the wet sections of the Mist Trail to avoid trail widening. Prevent trail creep along the John Muir Trail using fencing and boardwalks.	(CTA) Relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Harden the trail along the wet sections of the Mist Trail to avoid trail widening. Prevent trail creep along the John Muir Trail using fencing and boardwalks.	(CTA) Relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Harden the trail along the wet sections of the Mist Trail to avoid trail widening. Prevent trail creep along the John Muir Trail using fencing and boardwalks.	(CTA) Relocate sections of trail through wetland in Echo Valley and mineral spring outflow between Merced Lake and Washburn Lake to less sensitive areas. Harden the trail along the wet sections of the Mist Trail to avoid trail widening. Prevent trail creep along the John Muir Trail using fencing and boardwalks.
RES-1-005	1	Triple Fork Peak: trails through meadows	Formal trail through meadows causes extensive rutting and head cutting.	Reroute the trail to upland where possible.	The trail is rutted and braided as it traverses meadows in the Triple Peak Fork, which can affect surface and subsurface water flows that sustain the meadow.	(CTA) Re-route the trail to upland where possible.	(CTA) Re-route the trail to upland where possible.	(CTA) Re-route the trail to upland where possible.	(CTA) R-eroute the trail to upland where possible.	(CTA) Re-route the trail to upland where possible.
FAC-2-001	2	Yosemite Village: Concessioner General Office	The Concessioner General Office is located in the Valley. Employees correspondingly work and live in the Valley, so that they are close to their office.	Concessioner General Office building is removed from river corridor and essential functions infilled into the Concessioner Maintenance and Warehouse Building (behind the Valley Visitor Center).	The Concessioner General Office is located in the Valley. Employees correspondingly work and live in the Valley so that they are close to their office.	(CTA) Building is removed from river corridor.Essential functions infilled into the mezzanine of the existing Concessioner Maintenance and Warehouse Building behind Valley Visitor Center.	(CTA) Building is removed from river corridor.Essential functions infilled into the mezzanine of the existing Concessioner Maintenance and Warehouse Building behind Valley Visitor Center.	(CTA) Building is removed from river corridor.Essential functions infilled into the mezzanine of the existing Concessioner Maintenance and Warehouse Building behind Valley Visitor Center.	(CTA) Building is removed from river corridor.Essential functions infilled into the mezzanine of the existing Concessioner Maintenance and Warehouse Building behind Valley Visitor Center.	(CTA) Building is removed from river corridor.Essential functions infilled into a re-modeled Concessioner Maintenance and Warehouse Building with a 4,000-square-foot addition.
FAC-2-002	2	Yosemite Village: Concessioner Garage Relocation	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use. There is also a need for day use parking.	The Concessioner garage service is relocated to the Government Utility Building, outside of the corridor. The building is removed, and the Yosemite Village Day-Use Parking Area is expanded into the previous footprint. Visitor vehicle services are expanded in El Portal and Wawona service stations. Construct a two-bay roads and trails maintenance building in proximity to the Government Utility Building.	The Concessioner Garage is located in the river corridor, within the 100-year floodplain. Shuttles, tour buses, visitor and concessioner vehicles are serviced in this facility.	(CTA) The Concessioner garage service is relocated to the Government Utility Building, outside of the corridor. The building is removed, and parking is expanded into the previous footprint. Visitor vehicle services are expanded in El Portal and Wawona service stations. Construct a two-bay roads and trails maintenance building in proximity to the Government Utility Building.	(CTA) The Concessioner garage service is relocated to the Government Utility Building, outside of the corridor. The building is removed, and the Yosemite Village Day-Use Parking Area is expanded into the previous footprint. Visitor vehicle services are expanded in El Portal and Wawona service stations. Construct a two-bay roads and trails maintenance building in proximity to the Government Utility Building.	(CTA) The Concessioner garage service is relocated to the Government Utility Building, outside of the corridor. The building is removed, and the Yosemite Village Day-Use Parking Area is expanded into the previous footprint. Visitor vehicle services are expanded in El Portal and Wawona service stations. Construct a two-bay roads and trails maintenance building in proximity to the Government Utility Building.	(CTA) The Concessioner garage service is relocated to the Government Utility Building, outside of the corridor. The building is removed, and the Yosemite Village Day-Use Parking Area parking is expanded into the previous footprint. Visitor vehicle services are expanded in El Portal and Wawona service stations. Construct a two-bay roads and trails maintenance building in proximity to the Government Utility Building.	(CTA) The Concessioner garage service is relocated to the Government Utility Building, outside of the corridor. The building is removed, and the Yosemite Village Day-Use Parking Area parking is expanded into the previous footprint. Visitor vehicle services are expanded in El Portal and Wawona service stations. Construct a two-bay roads and trails maintenance building in proximity to the Government Utility Building.
FAC-2-004	2	Housekeeping Camp: Lodging	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.		Currently, there are 266 units at Housekeeping Camp within the 100-year floodplain.	Remove all lodging units and Housekeeping Camp amenities. Restore the 100-year floodplain to natural conditions.	Remove all of the lodging units. Convert Housekeeping Camp to a day use river access point and picnic area.	Remove 166 lodging units (83 duplex lodging units, 4 restrooms, store and office) out of the observed ordinary high water mark. Retain a total of 100 lodging units.	Remove 34 lodging units and redesign out of the ordinary high water mark. Retain a total of 232 lodging units.	Remove 34 lodging units and redesign out of the ordinary high water mark. Retain a total of 232 lodging units.
FAC-2-008	2	Housekeeping Camp: Services and Facilities	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.		Visitor-use facilities at Housekeeping Camp include: shower houses & restrooms, laundry and a grocery store.	Housekeeping Camp shower houses, laundry and grocery store are removed. Retain at least one restroom for day use.	Housekeeping Camp shower houses, laundry and grocery store are removed. Retain at least one restroom for day use.	Housekeeping Camp restrooms are reduced. Shower houses and laundry remains. Grocery store removed.	Housekeeping Camp shower houses and restrooms and the laundry remains. Grocery store removed.	Housekeeping Camp shower houses, restrooms, laundry, and grocery store remain.
FAC-2-010	2	Ahwahnee Hotel: Services and Facilities	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.	Retain the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop. Remove pool and tennis courts.	The Ahwahnee Hotel, a National Historic Landmark, has services and facilities that include bar and food service, dining room, gift shop, sweet shop, pool, and tennis courts.	(CTA) Retain the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop. Remove pool and tennis courts.	(CTA) Retain the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop. Remove pool and tennis courts.	(CTA) Retain the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop. Remove pool and tennis courts.	(CTA) Retain the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop. Remove pool and tennis courts.	(CTA) Retain the existing facilities and services, including bar and food service, dining room, gift shop, and sweet shop. Remove pool and tennis courts.

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FAC-2-011	2	Curry Village: Services and Facilities	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.	Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center, and Curry Village swimming pool. Remove the Happy Isles snack stand, the Curry Village bike and raft stands and the Curry Village ice rink.	Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center and retail, swimming pool, Happy Isles Snack Stand, Curry Village bike and raft stands, and Curry Village ice rink. Retain lodging units in the rock-fall hazard zone.	(CTA) Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center, and Curry Village swimming pool. Remove the Happy Isles snack stand, the Curry Village bike and raft stands, and the Curry Village ice rink.	(CTA) Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center, and Curry Village swimming pool. Remove the Happy Isles snack stand, the Curry Village bike and raft stands, and Curry Village ice rink.	(CTA) Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center, and Curry Village swimming pool. Remove the Happy Isles snack stand, the Curry Village bike and raft stands, and Curry Village ice rink.	(CTA) Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center, and Curry Village swimming pool. Remove the Happy Isles snack stand, the Curry Village bike and raft stands, and Curry Village ice rink.	(CTA) Retain Curry grocery store, pizza deck and bar, pavilion and cafeteria, Happy Isles Nature Center, and Curry Village swimming pool. Remove the Happy Isles snack stand, the Curry Village bike and raft stands, and Curry Village ice rink.
FAC-2-012	2	Yosemite Lodge: Services and Facilities	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.	Remove the NPS Volunteer Office (former Wellness Center), post office, swimming pool, bike stand and snack stand. Yosemite Lodge employee housing (Thousands Cabins) and Highland Court employee housing are removed. The convenience shop and nature shop are re-purposed. The Yosemite Lodge Food Court is retained.	Yosemite Lodge services and facilities would be retained in current configuration and at current level of service.	Yosemite Lodge converted from lodging to day-use. Retain core visitor services. Re-design lodge area to include 250 parking spaces. Mountain Room Bar & Food Service is re-purposed as a Day Lodge. Yosemite Lodge maintenance and housekeeping are removed.  (CTA) Remove the NPS Volunteer Office (former Wellness Center), post office, swimming pool, bike stand and snack stand. Yosemite Lodge employee housing (Thousands Cabins) and Highland Court employee housing are removed. The convenience shop and nature shop are re-purposed. The Yosemite Lodge Food Court is retained.	Yosemite Lodge maintenance and housekeeping are relocated. Removed temporary employee housing to be replaced with new housing.  (CTA) Remove the NPS Volunteer Office (former Wellness Center), post office, swimming pool, bike stand and snack stand. Yosemite Lodge employee housing (Thousands Cabins) and Highland Court employee housing are removed . The convenience shop and nature shop are re-purposed. The Yosemite Lodge Food Court is retained. Yosemite Lodge maintenance and housekeeping are relocated.	Yosemite Lodge maintenance and housekeeping are relocated. Removed temporary employee housing to be replaced with new housing.  (CTA) Remove the NPS Volunteer Office (former Wellness Center), post office, swimming pool, bike stand and snack stand. Yosemite Lodge employee housing (Thousands Cabins) and Highland Court employee housing are removed. The convenience shop and nature shop are re-purposed. The Yosemite Lodge Food Court is retained. Yosemite Lodge maintenance and housekeeping are relocated.	Yosemite Lodge maintenance and housekeeping are relocated. Removed temporary employee housing to be replaced with new housing.  (CTA) Remove the NPS Volunteer Office (former Wellness Center), post office, swimming pool, bike stand and snack stand. Yosemite Lodge employee housing (Thousands Cabins) and Highland Court employee housing are removed. The convenience shop and nature shop are re-purposed. The Yosemite Lodge Food Court is retained. Yosemite Lodge maintenance and housekeeping are relocated.	Yosemite Lodge maintenance and housekeeping are relocated. Removed temporary employee housing to be replaced with new housing.  (CTA) Remove the NPS Volunteer Office (former Wellness Center), post office, swimming pool, bike stand and snack stand. Yosemite Lodge employee housing (Thousands Cabins) and Highland Court employee housing are removed. The convenience shop and nature shop are re-purposed. The Yosemite Lodge Food Court is retained. Yosemite Lodge maintenance and housekeeping are relocated.
FAC-2-013	2	Yosemite Village: Services and Facilities	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.	The Concessioner Garage building is removed, and the service is relocated to the Government Utility Building. The Concessioner General Office building is removed, and the essential functions are relocated within the existing Concessioner Maintenance and Warehouse building. The Village Sport Shop is re-purposed as a visitor contact station. The Village Store and Grill are retained.	The configuration and level of services and facilities in Yosemite Village remains unchanged.	(CTA) The Concessioner Garage building is removed, and the service is relocated to the Government Utility Building. The Concessioner General Office building is removed, and the essential functions are relocated within the existing Concessioner Maintenance and Warehouse building. The Village Sport Shop is re-purposed as a visitor contact station. The Village Store and Grill are retained.	(CTA) The Concessioner Garage building is removed, and the service is relocated to the Government Utility Building. The Concessioner General Office building is removed, and the essential functions are relocated within the existing Concessioner Maintenance and Warehouse building. The Village Sport Shop is re-purposed as a visitor contact station. The Village Store and Grill are retained.	(CTA) The Concessioner Garage building is removed, and the service is relocated to the Government Utility Building. The Concessioner General Office building is removed, and the essential functions are relocated within the existing Concessioner Maintenance and Warehouse building. The Village Sport Shop is re-purposed as a visitor contact station. The Village Store and Grill are retained.	(CTA) The Concessioner Garage building is removed, and the service is relocated to the Government Utility Building. The Concessioner General Office building is removed, and the essential functions are relocated within the existing Concessioner Maintenance and Warehouse building. The Village Sport Shop is re-purposed as a visitor contact station. The Village Store and Grill are retained.	Infill the Concessioner General Office functions within a 4,000-square-foot addition to the Concessioner Maintenance and Warehouse Building.(CTA) The Concessioner Garage building is removed, and the service is relocated to the Government Utility Building. The Concessioner General Office building is removed, and the service is relocated. The Village Sport Shop is re-purposed as a visitor contact station. The Village Store and Grill are retained.
FAC-2-015	2	Yosemite Lodge: Housing north of former pine and oak and west of Yosemite Lodge Food Court	There is temporary employee housing in the Yosemite Lodge area.	Remove old and temporary housing at Highland Court and the Thousands Cabins.	There is temporary employee housing in the Yosemite Lodge area at Highland Court and the Thousands Cabins.	(CTA) Remove old and temporary housing at Highland Court and the Thousands Cabins.	(CTA) Remove old and temporary housing at Highland Court and the Thousands Cabins.  Construct two new concessioner housing areas housing 104 employees (26 in each structure/double occupancy). Construct 78 employee parking spaces.	(CTA) Remove old and temporary housing at Highland Court and the Thousands Cabins.  Construct two new concessioner housing areas housing 104 employees (26 in each structure/double occupancy). Construct 78 employee parking spaces.	(CTA) Remove old and temporary housing at Highland Court and the Thousands Cabins.  Construct two new concessioner housing areas housing 104 employees (26 in each structure/double occupancy). Construct 78 employee parking spaces.	(CTA) Remove old and temporary housing at Highland Court and the Thousands Cabins.  Construct two new concessioner housing areas housing 104 employees (26 in each structure/double occupancy). Construct 78 employee parking spaces.
FAC-2-016	2	Huff House temporary housing area	Currently, there is temporary housing at Huff House.	Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	Currently, there is temporary housing at Huff House and Boys Town.	(CTA) Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	(CTA) Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	(CTA) Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	(CTA) Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.	(CTA) Temporary housing at Huff House and Boys Town is removed. Construct 16 buildings, housing 164 employees using the same dormitory prototype.
FAC-2-017	2	Yosemite Village: Lost Arrow temporary employee housing	Currently, there is temporary employee housing in the Lost Arrow parking lot.		There is temporary employee housing in the Lost Arrow parking lot.	Remove temporary employee housing and re-establish an administrative parking lot with 50 spaces.	Remove temporary employee housing and re-establish an administrative parking lot with 50 spaces.	Replace temporary employee housing facilities with permanent housing facilities for 50 beds.	Replace temporary employee housing facilities with permanent housing facilities for 50 beds.	Replace temporary employee housing facilities with permanent housing facilities for 50 beds.

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FAC-2-018	2	Residence 1: Facilities	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.		Residence 1, also known as the Superintendent's House, would remain in place.	Residence 1, which is the Superintendent's House, is relocated outside the river corridor to the NPS housing area.	Residence 1, which is the Superintendent's House, is relocated outside of the river corridor to the NPS housing area.	Residence 1, which is the Superintendent's House, is relocated outside of the river corridor to the NPS housing area.	Residence 1, which is the Superintendent's House, is relocated outside of the river corridor to the NPS housing area.	Residence 1, which is also known as the Superintendent's House, remains in place.
ONA-2-001	2	Backpackers Campground	Campsites in Backpackers Campground are located in close proximity to the river.		There are a total of 25 walk-in sites in the inventory, including 2 administrative sites.	Remove all 25 walk-in sites, 21 of which are in the 100-year floodplain. Partially replace removed sites with 16 sites at Backpackers Campground Western Expansion.	Remove all 25 walk-in sites, 21 of which are within the 150-foot riparian buffer. Partially replace removed sites with 16 sites at Backpackers Campground Western Expansion.	Remove all 25 walk-in sites, 21 of which are within the 150-foot riparian buffer. Partially replace removed sites with 16 sites at Backpackers Campground Western Expansion.	Retain 10 walk-in sites and remove 15 walk-in sites within the 100-foot riparian buffer. Partially replace removed sites with 16 walk-in sites at Backpackers Campground Western Expansion.	Retain 10 walk-in sites and remove 15 walk-in sites within the 100-foot riparian buffer. Partially replace removed sites with 16 walk-in sites at Backpackers Campground Western Expansion.
ONA-2-002	2	Concessioner Stables in Yosemite Valley	The Concessioner Stables in Yosemite Valley are used by the concessioner to house the stock animals used to operate the High Sierra Camp and day rides in the Valley. The herd has decreased in size, but the facility footprint remains the same. A kennel service is also operated out of the stables.		The Concessioner Stables in Yosemite Valley are used by the concessioner to house the stock animals used to operate the High Sierra Camp and day rides in the Valley. The herd has decreased in size, but the facility footprint remains the same. A kennel service is also operated out of the stables.	Ecologically restore the Concessioner Stables in Yosemite Valley; eliminate commercial day rides. Remove associated housing (25 beds).	Reduce the footprint of the Concessioner Stables in Yosemite Valley to provide staging for temporary pack camp operation at Merced Lake High Sierra Camp and overflow parking for campgrounds. Eliminate commercial day horseback rides from Yosemite Valley. Kennel service remains. Retain associated housing (25 beds).	Concessioner Stables area would be re-developed as a new campground with 41 campsites. Remove associated housing (25 beds). Eliminate commercial day horseback rides from Yosemite Valley.	Retain Concessioner Stables in Yosemite Valley to support Merced Lake High Sierra Camp and overflow parking for campgrounds. Eliminate commercial day horseback rides from Yosemite Valley. Kennel service remains. Retain associated housing (25 beds).	Retain Concessioner Stables in Yosemite Valley in its current configuration. Kennel service remains. Eliminate commercial day horseback rides from Yosemite Valley. Retain associated housing (25 beds).
ONA-2-003	2	Eagle Creek New Campground	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.		No development exists in this currently disturbed area with no resource constraints.	No new camping added in this location.	No new camping added in this location.	No new camping added in this location.	New campground developed east of El Capitan Picnic Area with 40 drive-in car sites and 2 group campsites.	New campground developed east of El Capitan Picnic Area with 79 car and recreational vehicle sites.
ONA-2-004	2	Camp 4 Campground Eastward Expansion	Public comment indicated a desire to have more camping opportunities in Yosemite Valley. The rock-fall hazard study identified 8 campsites at Camp 4 that are within the rock-fall hazard zone.	Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4 (8 sites relocated out of the rock-fall hazard zone but remain within the Camp 4 footprint).	There is no development in this site east of Camp 4.	(CTA) Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4.	(CTA) Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4.	(CTA) Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4.	(CTA) Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4.	(CTA) Camp 4 expanded eastward to provide 35 additional walk-in sites. Retain 35 walk-in campsites at Camp 4.
ONA-2-005	2	Former Lower River Campground	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.		Area is passively restoring to natural conditions. (138 campsites removed after damage from 1997 flood)	Restore area to natural conditions and no new campsites constructed.	Restore area to natural conditions and no new campsites constructed.	Construct a new campground 150 feet away from the river with 40 walk-in sites. Provide 8 picnic tables and 20 parking places for day use. Direct visitors to access the river for boating and swimming by way of a path to the Housekeeping Camp eastern beach. Restore hydrologic processes in the southeast portion of the former campground area and within the 150-foot riparian buffer.	Restore area to natural conditions and no new campsites constructed. Provide 8 picnic tables and 20 parking places for day use. Direct visitors to access the river for boating and swimming by way of a path to the Housekeeping Camp eastern beach. Restore hydrologic processes in the southeast portion of the former campground area.	Construct a new campground 150 feet away from the river with 40 walk-in sites. Provide 8 picnic tables and 20 parking places for day use. Direct visitors to access the river for boating and swimming by way of a path to the Housekeeping Camp eastern beach. Restore hydrologic processes in the southeast portion of the former campground area and within the 150-foot riparian buffer.
ONA-2-007	2	Lower Pines	Campsites in Lower Pines campground receive periodic flooding and are located in close proximity to the river.	Remove Lower Pine Loop between sites 60 and 62, because it is within the bed and banks of the river.	The campground contains 76 campsites (16 sites are for administrative use / 18 sites are RV-only).	Retain 44 campsites and restore the 100-year floodplain by removing 32 camp sites, including the loop between sites 60-62 that is within the bed and banks of the river. Restore native plant communities.	Retain 61 campsites and remove 15 sites from within 150 feet of the ordinary high water mark, including the loop between sites 60-62 that is within the bed and banks of the river. Restore native plant communities.	Retain 61 campsites and remove 15 sites from within 150 feet of the ordinary high water mark, including the loop between sites 60-62 that is within the bed and banks of the river. Restore native plant communities.	Retain 71 campsites and remove 5 sites from within 100 feet of the ordinary high water mark, including the loop between sites 60-62 that is within the bed and banks of the river. Restore native plant communities.	Retain 71 campsites and remove 5 sites from within 100 feet of the ordinary high water mark, including the loop between sites 60-62 that is within the bed and banks of the river. Restore native plant communities.
ONA-2-008	2	North Pines	Campsites in North Pines campground receive periodic flooding and are located in close proximity to the river.		The campground contains 86 campsites (5 are for administrative use, 23 sites are RV-only).	Restore the 100-year floodplain by removing 86 camp sites and restore native plant communities.	Retain 52 campsites and remove 34 sites from within 150 feet of the ordinary high water mark and restore native plant communities.	Retain 52 campsites and remove 34 sites from within 150 feet of the ordinary high water mark and restore native plant communities.	Retain 72 campsites and remove 14 sites from within 100 feet of the ordinary high water mark and restore native plant communities.	Retain 72 campsites and remove 14 sites from within 100 feet of the ordinary high water mark and restore native plant communities.
ONA-2-009	2	Upper Pines	Campsites in Upper Pines campground are located in close proximity to the river.		The campground inventory has 240 sites (2 are for administrative use, 44 RV only sites)	Retain 216 campsites and restore the 100-year floodplain by removing 22 campsites and an additional 2 sites for cultural resource concerns.	Retain 238 campsites, removing 2 sites for cultural resource concerns.	Retain 238 campsites, removing 2 sites for cultural resource concerns.	Retain 238 campsites, removing 2 sites for cultural resource concerns.	Retain 238 campsites, removing 2 sites for cultural resource concerns.

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ONA-2-010	2	Upper Pines Loop Addition	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.		No new camping is developed in this location.	No new camping is developed in this location.	Camping new development: addition of recreational vehicle campground loop with 36 RV sites.	Camping new development: addition of recreational vehicle campground loop with 36 RV sites.	Camping new development: addition of recreational vehicle campground loop with 36 RV sites.	Camping new development: addition of recreational vehicle campground loop with 36 RV sites.
ONA-2-011	2	Upper Pines Walk-In Addition	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.		No new camping is developed in this location.	No new camping is developed in this location.	No new camping is developed in this location.	Addition of walk-in campground with 51 sites, 49 walk-in sites and 2 group sites.	Addition of walk-in campground with 51 sites, 49 walk-in sites and 2 group sites.	Addition of walk-in campground with 51 sites, 49 walk-in sites and 2 group sites.
ONA-2-012	2	Backpackers Campground Western Expansion	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.	Construction of 16 new walk-in sites West of Backpackers Camp.	No new camping is developed in this location.	(CTA) Construction of 16 new walk-in sites West of Backpackers Camp.	(CTA) Construction of 16 new walk-in sites West of Backpackers Camp.	(CTA) Construction of 16 new walk-in sites West of Backpackers Camp.	(CTA) Construction of 16 new walk-in sites West of Backpackers Camp.	(CTA) Construction of 16 new walk-in sites West of Backpackers Camp.
ONA-2-013	2	West of Lodge New Campground	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.		No development in this location.	Area used for parking. Yosemite Lodge converted from lodging to day use, parking and camping.	No new sites added.	Construct 20 RVs sites. (West of Parking)	No new sites added.	Construct 20 RVs sites. (West of Parking)
ONA-2-014	2	Yellow Pine Administrative	Yellow Pine Campground is currently only available for administrative use (4 group sites for up to 120 people.)		Yellow Pine Administrative Campground is only available for administrative use (4 group sites for up to 120 people.)	Remove camping and restore the 100-year floodplain to natural conditions. Shift administrative camping to Abbieville and Trailer Village.	Retain 4 group administrative use sites (up to 120 people).	Retain 4 group administrative use sites (up to 120 people).	Retain 4 group administrative use sites (up to 120 people).	Retain 4 group administrative use sites (up to 120 people).
ONA-2-015	2	Yosemite Lodge: re-purposed as camping	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.		This site is currently an overnight lodging and parking area.	Remove the existing lodging structures (see Yosemite Lodge: Lodging) and construct 100 new walk-in campsites and 4 group sites.	No new sites constructed.	No new sites constructed.	No new sites constructed.	No new sites constructed.
ONA-2-016	2	Former Upper River Campground	Public comment indicated a desire to have more camping opportunities in Yosemite Valley.		Area is passively restoring to natural conditions (124 campsites removed after 1997 flood). Infrastructure such as asphalt, remains.	Restore area to natural conditions and no new campsites constructed.	Restore area to natural conditions and no new campsites constructed.	Construct a new campground with 30 walk-in sites and 2 group sites, north of the river a minimum of 150 feet away from the ordinary high-water mark. Restore hydrologic processes in the southeast portion of the former campground area.	Construct a new campground with 30 walk-in sites, north of the river a minimum of 150 feet away from the ordinary high-water mark. Restore hydrologic processes in the southeast portion of the former campground area.	Construct a new campground with 30 walk-in sites and 2 group sites, north of the river a minimum of 150 feet away from the ordinary high-water mark. Restore hydrologic processes in the southeast portion of the former campground area.
ONA-2-019	2	Yosemite Lodge: Lodging	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.		There are 245 lodging units at Yosemite Lodge.	Remove all of the lodging units at Yosemite Lodge (-245 units). Re-purpose the area outside the 100-year floodplain for day-use parking, a Day Lodge (Mountain Room and food service ) and camping (See Yosemite Lodge re-purposed as camping). Restore the 100-year floodplain.	Retain 143 units. Remove 4 buildings from the 100-year floodplain and restore the floodplain.	Retain the existing 245 units.	Retain the existing 245 units.	Construct new 3 story-lodging structure(s) with the pre-flood number of 440 units (redesign Yosemite Lodge out of the 100-year floodplain).
ONA-2-021	2	Curry Village: Lodging	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.		There are 400 lodging units at Curry Village that can be counted in the "No-Action," per the Settlement Agreement; additional temporary guest lodging units currently in the Boys Town area are not considered part of the No Action Alternative.	Total would be 433 guest units, including: 290 tents in Curry Village retained; 78 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.	Total would be 355 guest units, including: 290 tents in Curry Village retained; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained. At Boys Town, Southside Drive would be re-routed and the area ecologically restored.	Total would be 355 guest units, including: 290 tents in Curry Village retained; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained. At Boys Town, Southside Drive would be re-routed and a 40-site campground would be constructed.	Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.	Total would be 453 guest units, including: 290 tents in Curry Village retained; 98 hard-sided units in Boys Town constructed; 18 units at Stoneman House retained; and 47 cabin-with-bath units in Curry Village retained.
REC-2-001	2	Bridalveil Fall Area Redesign	The popularity and location of this attraction site at periods of peak visitation has led to crowding and congestion, which negatively affects the visitor experience. Crowding and congestion occurs on trails, at the viewing platform, along roadways, and at the parking area.	(CTA) Re-design entire area to improve the visitor experience by providing consistent pedestrian and vehicle capacities and flow to meet current demand. Restore informal trails to natural conditions. Improve accessibility to pedestrian walkways and restrooms where appropriate.	The existing design capacity of the pedestrian and vehicle circulation system at this popular attraction site does not accommodate the level of visitor use it receives. A network of social trails exists. Overflow roadside parking and traffic congestion frequently occurs. Neither the pedestrian walkways nor the restrooms meet current accessibility standards.	(CTA) Re-design entire area to improve the visitor experience by providing consistent pedestrian and vehicle capacities and flow to meet current demand. Restore informal trails to natural conditions. Improve accessibility to pedestrian walkways and restrooms where appropriate.	(CTA) Re-design entire area to improve the visitor experience by providing consistent pedestrian and vehicle capacities and flow to meet current demand. Restore informal trails to natural conditions. Improve accessibility to pedestrian walkways and restrooms where appropriate.	(CTA) Re-design entire area to improve the visitor experience by providing consistent pedestrian and vehicle capacities and flow to meet current demand. Restore informal trails to natural conditions. Improve accessibility to pedestrian walkways and restrooms where appropriate.	(CTA) Redesign entire area to improve the visitor experience by providing consistent pedestrian and vehicle capacities and flow to meet current demand. Restore informal trails to natural conditions. Improve accessibility to pedestrian walkways and restrooms where appropriate.	(CTA) Re-design entire area to improve the visitor experience by providing consistent pedestrian and vehicle capacities and flow to meet current demand. Restore informal trails to natural conditions. Improve accessibility to pedestrian walkways and restrooms where appropriate.

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REC-2-002	2	Interpretation of natural river processes	There are few (no) interpretive nature walks that educate the public on natural river processes and protection and stewardship of river-related resources.	Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	There are few (no) interpretive nature walks that educate the public on natural river processes and protection and stewardship of river-related resources.	(CTA) Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	(CTA) Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	(CTA) Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	(CTA) Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.	(CTA) Create an interpretive (nature) walk through Lower Rivers that emphasizes river-related natural processes, the park's ecological restoration work and what visitors can do to protect the river.
REC-2-003	2	Happy Isles Wayfinding	Inadequate way finding and unclear pedestrian circulation are contributing factors to the vegetation trampling, causing a large area of denuded vegetation.	Improve way finding between Happy Isles and the Mist Trail from the shuttle stop.	Inadequate way finding and unclear pedestrian circulation are contributing factors to the vegetation trampling.	(CTA) Improve way finding between Happy Isles and the Mist Trail from the shuttle stop.	(CTA) Improve way finding between Happy Isles and the Mist Trail from the shuttle stop.	(CTA) Improve way finding between Happy Isles and the Mist Trail from the shuttle stop.	(CTA) Improve way finding between Happy Isles and the Mist Trail from the shuttle stop.	(CTA) Improve way finding between Happy Isles and the Mist Trail from the shuttle stop.
RES-2-001	2	Valley Meadows: Ditching	Ditches impact meadows by increasing drainage and lowering the water table. This in turn impacts native meadow plant communities and corresponding ethnographic resources.	Fill 2,155 feet of ditches not serving current operational needs using adjacent berm material or pond and plug techniques.	Human-constructed ditches would remain in meadows throughout Yosemite Valley.	(CTA) Fill 2,155 feet of ditches not serving current operational needs using adjacent berm material or pond and plug techniques.	(CTA) Fill 2,155 feet of ditches not serving current operational needs using adjacent berm material or pond and plug techniques.	(CTA) Fill 2,155 feet of ditches not serving current operational needs using adjacent berm material or pond and plug techniques.	(CTA) Fill 2,155 feet of ditches not serving current operational needs using adjacent berm material or pond and plug techniques.	(CTA) Fill 2,155 feet of ditches not serving current operational needs using adjacent berm material or pond and plug techniques.
RES-2-002	2	Yosemite Valley: Plant community changes	Synergistic effects of many factors, including natural selection and past human actions, have led to changes in Yosemite Valley plant communities that are ecologically connected to the meadow and riparian ecosystem of the Merced River. Changes in plant communities include increasing conifers, denser canopy covers, and high fuel loading.	Improve condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance scenic vistas and maintain the cultural landscape, as well as enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.	These plant communities will continue to become more densely forested, and the desirable mosaic of plant communities in the Merced River corridor will continue to become less diverse.	(CTA) Improve condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance scenic vistas and maintain the cultural landscape, as well as enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.	(CTA) Improve condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance scenic vistas and maintain the cultural landscape, as well as enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.	(CTA) Improve condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance scenic vistas and maintain the cultural landscape, as well as enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.	(CTA) Improve condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance scenic vistas and maintain the cultural landscape, as well as enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.	(CTA) Improve condition of plant communities at specific locations in Yosemite Valley (targeted 67 potential acres) by restoring the mosaic of meadow, riparian deciduous vegetation, black oak, and open mixed conifer forest. Management actions may include re-vegetation, prescribed fire, mechanical removal of conifers, and re-design of infrastructure. These actions will enhance scenic vistas and maintain the cultural landscape, as well as enhance the condition of the Merced River ecosystem by sustaining the diverse mosaic of interconnected plant communities.
RES-2-003	2	Ahwahnee Meadow oxbows: formal trail impacts	350 feet of trail through two segments of oxbow wetland limits hydrologic connectivity.		Formal trails would continue to traverse wetlands in the Ahwahnee meadow (350 feet long section of trail).	Re-route the trail so it does not pass through wetlands; consolidate use with Housekeeping Footbridge trail where possible. Remove that section of trail and its associated fill.	Re-route the trail so it does not pass through wetlands; consolidate use with Housekeeping Footbridge trail where possible. Remove that section of trail and its associated fill.	In the section of trail that passes through meadow and wet areas, remove fill and replace with a boardwalk.	In the section of trail that passes through meadow and wet areas, remove fill and replace with a boardwalk.	In the section of trail that passes through meadow and wet areas, remove fill and replace with a boardwalk.
RES-2-004	2	Ahwahnee Meadow: Northside Drive and bike path impact hydrology and meadow extent	Ahwahnee Meadow: Northside Drive and bike path impact hydrology and meadow extent		Northside Drive and the adjacent bike path bisect Ahwahnee Meadow.	Remove 900 feet of road and relocate the bike path to the south, to improve meadow/river connectivity. Restore meadow contours and native vegetation.	Remove 900 feet of road and relocate the bike path to the south, to improve the meadow/river connectivity. Restore meadow contours and native vegetation.	Northside Drive remains. Improve hydrologic connectivity between both sides of the road, by increasing the number of culverts. Bike path remains alongside road.	Northside Drive remains. Improve hydrologic connectivity between both sides of the road, by increasing the number of culverts. Bike path remains alongside road.	Northside Drive remains. Improve hydrologic connectivity between both sides of the road, by increasing the number of culverts. Bike path remains alongside road.
RES-2-005	2	Valley Meadows: Valley Loop Trail impacts through meadows	The Valley Loop Trail passes through sensitive and sometimes inundated meadow habitat in Slaughterhouse Meadow and Bridalveil Meadow causing fragmentation, informal trail creation, soil compaction and vegetation trampling.	Re-vegetate the abandoned sections of trail with native meadow species.	The Valley Loop Trail passes through sensitive and sometimes inundated meadow habitat in Slaughterhouse Meadow and Bridalveil Meadow.	Re-route trail through Slaughterhouse Meadow out of wetlands to an upland area. Move 780 feet of the trail through Bridalveil Meadow 8-12 feet to the toe of the fill slope of Southside Drive.	Re-route trail through Slaughterhouse Meadow out of wetlands to an upland area. Move 780 feet of the trail through Bridalveil Meadow 8-12 feet to the toe of the fill slope of Southside Drive.	Re-route trail through Slaughterhouse Meadow out of wetlands to an upland area. Move 780 feet of the trail through Bridalveil Meadow to the toe of the fill slope of Southside Drive.	Construct boardwalks through sensitive wet meadow habitat in Slaughterhouse Meadow. Move 780 feet of the trail that runs through Bridalveil Meadow to the toe of the fill slope of Southside Drive.	Construct boardwalks through sensitive wet meadow habitat in Slaughterhouse Meadow. Move 780 feet of the trail that runs through Bridalveil Meadow to the toe of the fill slope of Southside Drive.

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RES-2-007	2	Yosemite Village: Indian Creek Ahwahnee Row and Tecoya Housing	The Tecoya Housing is in the 100-year floodplain and Ahwahnee Row housing sits on former meadow and truncates the current western extent of Ahwahnee Meadow. These buildings and associated parking areas have been built on wetlands and affect the hydrologic processes of Indian Creek.	Create a buffer zone for Indian Creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.	Tecoya dorm and Ahwahnee Row Housing would remain within the 100-year floodplain (buildings and associated parking areas).	(CTA) Create a buffer zone for Indian Creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.Also, remove housing and development between Village Store and Ahwahnee Meadow, decompact soils, recontour topography (using 1919 maps as a guide) and plant native meadow vegetation. Restore stream hydrology.	(CTA) Create a buffer zone for Indian Creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.Housing and development between Village Store and Ahwahnee Meadow remain.	(CTA) Create a buffer zone for Indian Creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.Housing and development between Village Store and Ahwahnee Meadow remain.	(CTA) Create a buffer zone for Indian Creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.Housing and development between Village Store and Ahwahnee Meadow remain.	(CTA) Create a buffer zone for Indian Creek by pulling parking and residential yard use back 50 feet. Restore native riparian vegetation and protect with restoration fencing. Heavy equipment including excavator, skid steer, loader, and dump truck would be used.Housing and development between Village Store and Ahwahnee Meadow remain.
RES-2-008	2	Stoneman Meadow and Curry Orchard parking lot: road through meadow and parking lot	Stoneman Meadow is bisected by Southside Drive. The elevated road prism disconnects surface and groundwater within the meadow. This impacts the high water table, which is critical to maintain the integrity of meadow habitat. Curry Village orchard parking area is in what was formerly Stoneman Meadow, which has an impact on the meadow extent related to the Biological ORV.		Stoneman Meadow is bisected by Southside Drive. Curry Village orchard parking area is in what was formerly Stoneman Meadow.	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and re-alignment of road through Boys Town area. The Orchard Parking Lot would be re-designed and engineering solutions applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. Remove apple trees and landscape with native vegetation. Extend the meadow boardwalk through wet areas to Curry Village (up to 275 feet).	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and realignment of road through Boys Town area. The Orchard Parking Lot would be re-designed and engineering solutions applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. Remove apple trees and landscape with native vegetation. Extend the meadow boardwalk through wet areas to Curry Village (up to 275 feet).	Restore Stoneman Meadow including removal of 1,335 feet of Southside Drive and realignment of road through Boys Town area. The Orchard Parking Lot would be re-designed and engineering solutions applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. Remove apple trees and landscape with native vegetation. Extend the meadow boardwalk through wet areas to Curry Village (up to 275 feet).	The Orchard Parking Lot would be re-designed and engineering solutions applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. Remove apple trees and landscape with native vegetation.	The Orchard Parking Lot would be re-designed and engineering solutions applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. Remove apple trees and landscape with native vegetation.
RES-2-009	2	El Capitan Meadow: Informal trails, bisected by road, conifer encroachment	Climber use trails dissect El Capitan Meadow on the north side. Informal trails through the meadow and associated oak woodland lead to vegetation trampling and soil compaction. Water pools on the north side of the road, blocking water flows between the adjacent cliff walls and the meadow. Conifer saplings are encroaching on the meadow, resulting in the loss of meadow habitat. Roadside parking remains curbed to prevent encroachment on meadow.	Reroute climber use trails on north side of road from meadow habitat to an appropriate upland route (a few meters to the east). Remove informal trails through meadow and oak woodland. Protect re-vegetated areas with fencing or other natural barriers and sign the area to reduce trampling of sensitive meadow vegetation. As opportunities arise through maintenance or restoration projects, improve hydrologic flow and meadow connectivity by extending the permeable road base across the entire segment of Northside Drive through El Capitan Meadow and add additional box culverts with bottom elevations equal to the meadow surface elevation. Remove conifer saplings encroaching on meadow habitat.	Soil compaction and trampled vegetation would continue to exist due to informal trails and easy access to the meadow from roadside parking. Continue to remove invasive non-native plants following the Invasive Plant Management Plan and continue with prescribed fire following the Fire Management Plan, including mechanical removal of conifer saplings to reduce fuel load.	Remove all informal trails and areas of bare compacted soils and restore to native plan communities. Disperse and reduce roadside parking along the meadow through alternative pavement striping (approximately 30 spaces removed). Retain some roadside parking for SAR and other administrative traffic. Use restoration fencing and signing where necessary to further protect the meadow from trampling.	Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing and signing to designate appropriate meadow access points.	Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing along northern perimeter of meadow and designate appropriate access points using boardwalks and viewing platforms.	Remove all informal trails from the meadow that incise, promote habitat fragmentation, or are located in sensitive and frequently inundated areas, and restore to natural condition. Use restoration fencing along northern perimeter of meadow and designate appropriate access points using boardwalks and viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside.	Restore all informal trails to the meadow. Use restoration fencing to prohibit all foot traffic into meadow, including the southern perimeter, and designate all meadow access using boardwalks and viewing platforms. Selectively remove mature conifers that block views of El Capitan from the roadside.



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RES-2-010	2	Bridalveil Meadow: stream headcutting and absence of willows	A deep headcut from a former ditch remains adjacent to Bridalveil Meadow, which subsequently causes meadow dewatering and heavy downstream erosion. Willows were once abundant in Bridalveil meadow. They do not easily regenerate after wholesale removal and thus the meadow has remained without willows for over a century, resulting in less biological diversity in the meadow.	Treat by inserting live willow cuttings into the headcut area, river bank and adjacent meadow. Address headcuts in stream on west edge of meadow by planting willow cuttings in the impacted area, along riverbank, and adjacent meadow. Re-establish the riparian shrub layer. Remove encroaching conifer saplings.	A deep headcut from a former ditch remains adjacent to Bridalveil Meadow. Willows were once abundant in Bridalveil meadow. They do not easily regenerate after wholesale removal and thus the meadow has remained without willows for over a century, resulting in less biological diversity in the meadow.	(CTA) Treat by inserting live willow cuttings into the headcut area, river bank and adjacent meadow. Address headcuts in stream on west edge of meadow by planting willow cuttings in the impacted area, along riverbank, and adjacent meadow. Re-establish the riparian shrub layer. Remove encroaching conifer saplings.	(CTA) Treat by inserting live willow cuttings into the headcut area, river bank and adjacent meadow. Address headcuts in stream on west edge of meadow by planting willow cuttings in the impacted area, along riverbank, and adjacent meadow. Re-establish the riparian shrub layer. Remove encroaching conifer saplings.	(CTA) Treat by inserting live willow cuttings into the headcut area, river bank and adjacent meadow. Address headcuts in stream on west edge of meadow by planting willow cuttings in the impacted area, along riverbank, and adjacent meadow. Re-establish the riparian shrub layer. Remove encroaching conifer saplings.	(CTA) Treat by inserting live willow cuttings into the headcut area, river bank and adjacent meadow. Address headcuts in stream on west edge of meadow by planting willow cuttings in the impacted area, along riverbank, and adjacent meadow. Re-establish the riparian shrub layer. Remove encroaching conifer saplings.	(CTA) Treat by inserting live willow cuttings into the headcut area, river bank and adjacent meadow. Address headcuts in stream on west edge of meadow by planting willow cuttings in the impacted area, along riverbank, and adjacent meadow. Re-establish the riparian shrub layer. Remove encroaching conifer saplings.
RES-2-011	2	Cook's Meadow: roadbed abandoned infrastructure	There is an abandoned road bed north of Northside Drive between the Rangers' Club and the three-way stop that was former meadow habitat.	Remove fill of a former road bed north of Northside Drive between the Rangers' Club and the three-way stop. Revegetate with native meadow species.	There is an abandoned road bed north of Northside Drive between the Rangers' Club and the three-way stop that was former meadow habitat.	(CTA) Remove fill of a former road bed north of Northside Drive between the Rangers' Club and the three-way stop. Revegetate with native meadow species.	(CTA) Remove fill of a former road bed north of Northside Drive between the Rangers' Club and the three-way stop. Revegetate with native meadow species.	(CTA) Remove fill of a former road bed north of Northside Drive between the Rangers' Club and the three-way stop. Revegetate with native meadow species.	(CTA) Remove fill of a former road bed north of Northside Drive between the Rangers' Club and the three-way stop. Revegetate with native meadow species.	(CTA) Remove fill of a former road bed north of Northside Drive between the Rangers' Club and the three-way stop. Revegetate with native meadow species.
RES-2-012	2	Cook's Meadow: informal shoulder parking	Informal shoulder parking is encroaching on Cook's Meadow at both Sentinel Drive and Northside Drive. The footprint has increased over time (now up to 25-foot impact) and subsequently reduced the meadow extent.	Remove roadside parking along Cook's meadow and restore to meadow conditions.	Informal shoulder parking is encroaching on Cook's Meadow at both Sentinel Drive and Northside Drive. The footprint has increased over time (now up to 25 feet).	(CTA) Remove roadside parking along Cook's meadow and restore to meadow conditions.	(CTA) Remove roadside parking along Cook's meadow and restore to meadow conditions.	(CTA) Remove roadside parking along Cook's meadow and restore to meadow conditions.	(CTA) Remove roadside parking along Cook's meadow and restore to meadow conditions.	(CTA) Remove roadside parking along Cook's meadow and restore to meadow conditions.
RES-2-013	2	Leidig Meadow: Informal trailing	Informal trailing in Leidig meadow is extensive and highly fragments the meadow. The area surrounding the north side of swinging has a high density of informal trails.	Remove informal trails that incise meadow, and areas of wet and/or sensitive vegetation which fragment meadow habitat. Restore native meadow vegetation.	Informal trailing in Leidig meadow is extensive causing high levels of fragmentation. The area surrounding the north side of Swinging Bridge has a high density of informal trails.	(CTA) Remove informal trails that incise meadow, and areas of wet and/or sensitive vegetation which fragment meadow habitat. Restore native meadow vegetation.	(CTA) Remove informal trails that incise meadow, and areas of wet and/or sensitive vegetation which fragment meadow habitat. Restore native meadow vegetation.	(CTA) Remove informal trails that incise meadow, and areas of wet and/or sensitive vegetation which fragment meadow habitat. Restore native meadow vegetation.	(CTA) Remove informal trails that incise meadow, and areas of wet and/or sensitive vegetation which fragment meadow habitat. Restore native meadow vegetation.	(CTA) Remove informal trails that incise meadow, and areas of wet and/or sensitive vegetation which fragment meadow habitat. Restore native meadow vegetation.
RES-2-014	2	Eagle Creek/Rocky Point Sewage Plant: abandoned infrastructure	Lasting impacts from the former Eagle Creek/Rocky Point sewage plant are still evident today. Infrastructure remains underground that affects meadow hydrology including pipes that dewater the meadow.	Remove abandoned infrastructure from vicinity of Eagle Creek Meadow and restore 3.5 acres of meadow habitat.	The Eagle Creek/Rocky Point sewage plant infrastructure remains underground within Eagle Creek meadow.	(CTA) Remove abandoned infrastructure from vicinity of Eagle Creek Meadow and restore 3.5 acres of meadow habitat.	(CTA) Remove abandoned infrastructure from vicinity of Eagle Creek Meadow and restore 3.5 acres of meadow habitat.	(CTA) Remove abandoned infrastructure from vicinity of Eagle Creek Meadow and restore 3.5 acres of meadow habitat.	(CTA) Remove abandoned infrastructure from vicinity of Eagle Creek Meadow and restore 3.5 acres of meadow habitat.	(CTA) Remove abandoned infrastructure from vicinity of Eagle Creek Meadow and restore 3.5 acres of meadow habitat.
RES-2-015	2	Leidig Meadow: Bike Path	The bike path through Leidig Meadow runs within the bed and banks and is inundated during the spring high water.	Replace a section of paved trail within the bed and banks of the river with an elevated boardwalk.	The bike path through Leidig Meadow runs within the bed and banks and is inundated during the spring high water.	(CTA) Replace a section of paved trail within the bed and banks of the river with an elevated boardwalk.	(CTA) Replace a section of paved trail within the bed and banks of the river with an elevated boardwalk.	(CTA) Replace a section of paved trail within the bed and banks of the river with an elevated boardwalk.	(CTA) Replace a section of paved trail within the bed and banks of the river with an elevated boardwalk.	(CTA) Replace a section of paved trail within the bed and banks of the river with an elevated boardwalk.
RES-2-016	2	Royal Arches Meadow: abandoned infrastructure	Royal Arches Meadow contains tiles and pipes that cause meadow dewatering. A former road bed remains between the meadow and Tenaya Creek, impacting hydrology and vegetation; the adjacent riparian area contains thick conifer sapling cover.	Remove tiles, pipes and abandoned road. Decomact soils, remove conifers and revegetate with riparian species.	Royal Arches Meadow contains tiles and pipes. A former road bed remains between the meadow and Tenaya Creek; conifer saplings encroach into the adjacent riparian area.	(CTA) Remove tiles, pipes and abandoned road. Decomact soils, remove conifers and revegetate with riparian species.	(CTA) Remove tiles, pipes and abandoned road. Decomact soils, remove conifers and revegetate with riparian species.	(CTA) Remove tiles, pipes and abandoned road. Decomact soils, remove conifers and revegetate with riparian species.	(CTA) Remove tiles, pipes and abandoned road. Decomact soils, remove conifers and revegetate with riparian species.	(CTA) Remove tiles, pipes and abandoned road. Decomact soils, remove conifers and revegetate with riparian species.
RES-2-017	2	Road improvements in meadows	Due to the presence of roads in meadows, large portions of the floodplain become disconnected from the river, disrupting the ecological function of the meadows.	Road improvements over meadows will maintain formalized shoulder parking and use wide box culverts or other design components such as rolling dips, permeable subgrade, etc to improve surface water flow.	Due to the presence of Southside Drive, a large portion of the floodplain in Sentinel Meadow is disconnected from the river.	(CTA) Road improvements over meadows will maintain formalized shoulder parking and use wide box culverts or other design components such as rolling dips, permeable subgrade, etc to improve surface water flow.	(CTA) Road improvements over meadows will maintain formalized shoulder parking and use wide box culverts or other design components such as rolling dips, permeable subgrade, etc to improve surface water flow.	(CTA) Road improvements over meadows will maintain formalized shoulder parking and use wide box culverts or other design components such as rolling dips, permeable subgrade, etc to improve surface water flow.	(CTA) Road improvements over meadows will maintain formalized shoulder parking and use wide box culverts or other design components such as rolling dips, permeable subgrade, etc to improve surface water flow.	(CTA) Road improvements over meadows will maintain formalized shoulder parking and use wide box culverts or other design components such as rolling dips, permeable subgrade, etc to improve surface water flow.
RES-2-018	2	Sentinel Meadow: Trampling	The current boardwalk fails to address adequately address use in Sentinel Meadow, resulting in substantial meadow trampling and soil compaction.	Add 150 feet of boardwalk to the west of the existing boardwalk in order to accommodate visitors and reduce meadow trampling.	A portion of Sentinel Meadow has substantial meadow trampling and soil compaction from visitor use.	(CTA) Add 150 feet of boardwalk to the west of the existing boardwalk in order to accommodate visitors and reduce meadow trampling.	(CTA) Add 150 feet of boardwalk to the west of the existing boardwalk in order to accommodate visitors and reduce meadow trampling.	(CTA) Add 150 feet of boardwalk to the west of the existing boardwalk in order to accommodate visitors and reduce meadow trampling.	(CTA) Add 150 feet of boardwalk to the west of the existing boardwalk in order to accommodate visitors and reduce meadow trampling.	(CTA) Add 150 feet of boardwalk to the west of the existing boardwalk in order to accommodate visitors and reduce meadow trampling.

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RES-2-019	2	Western portion of Former Lower Pines Campground loop: abandoned infrastructure	Closed portion of Lower Pines campground, historically a floodplain/meadow/riparian complex, has retained impacts of development including compacted soils, fill material over native soils, and invasive plant infestations.	Restore 20 acres of floodplains at the portion of Lower Pines campground that was closed after the flood.	The closed portion of Lower Pines campground, once a floodplain, meadow, and riparian complex, has not been restored since the campsites were removed after the 1997 flood. The area has compacted soils, fill material over native soils, and invasive plant infestations.	(CTA) Restore 20 acres of floodplains at the portion of Lower Pines campground that was closed after the flood.	(CTA) Restore 20 acres of floodplains at the portion of Lower Pines campground that was closed after the flood.	(CTA) Restore 20 acres of floodplains at the portion of Lower Pines campground that was closed after the flood.	(CTA) Restore 20 acres of floodplains at the portion of Lower Pines campground that was closed after the flood.	(CTA) Restore 20 acres of floodplains at the portion of Lower Pines campground that was closed after the flood.
RES-2-020	2	Devil's Elbow: riverbank erosion	Visitor use impacts are causing river bank erosion and loss of riparian vegetation in localized areas such as El Capitan Bridge and Devil's Elbow. There are also safety concerns with the pedestrian crossings here.	Relocate parking from Devil's elbow to the east of the current parking lot, and delineate a trail to access the large sandbar to the east of the “elbow”, river right. Remove informal trail and restore to meadow conditions (designated with river access signs).	Visitor use between El Capitan Bridge and Devil's Elbow exceeds the design of the existing infrastructure. Visitors park on the north side of the road creating safety issues on a tight corner, accessing the river in sensitive areas.	(CTA) Relocate parking from Devil's elbow to the east of the current parking lot, and delineate a trail to access the large sandbar to the east of the “elbow,” river right. Remove informal trail and restore to meadow conditions (designated with river access signs).	(CTA) Relocate parking from Devil's elbow to the east of the current parking lot, and delineate a trail to access the large sandbar to the east of the “elbow,” river right. Remove informal trail and restore to meadow conditions (designated with river access signs).	(CTA) Relocate parking from Devil's elbow to the east of the current parking lot, and delineate a trail to access the large sandbar to the east of the “elbow,” river right. Remove informal trail and restore to meadow conditions (designated with river access signs).	(CTA) Relocate parking from Devil's elbow to the east of the current parking lot, and delineate a trail to access the large sandbar to the east of the “elbow,” river right. Remove informal trail and restore to meadow conditions (designated with river access signs).	(CTA) Relocate parking from Devil's elbow to the east of the current parking lot, and delineate a trail to access the large sandbar to the east of the “elbow,” river right. Remove informal trail and restore to meadow conditions (designated with river access signs).
RES-2-021	2	Former Upper River / Lower River Campground: localized riparian and floodplain impacts	This area is critical to providing hydrologic connectivity between Ahwahnee and Stoneman meadows; however, it is currently not functioning as a healthy riparian and floodplain ecosystem due to lost topography (graded landscape and filled drainages), compacted soils, existing (amphitheater) and abandoned infrastructure, and invasive plant infestations.		This area is critical to the hydrologic connectivity between Ahwahnee and Stoneman meadows. It is not functioning as a healthy riparian and floodplain ecosystem due to lost topography (graded landscape and filled drainages), compacted soils, existing (amphitheater) and abandoned infrastructure, and invasive plant infestations.	Restore 35.6 acres of 10-year floodplain. Remove remaining asphalt, decompact soils of former roads and campsites and re-establish seasonal channels and natural topography that have been filled. Remove Lower River amphitheater structure and fill. Temporarily fence restoration areas to allow for recovery.	Restore 35.6 acres of 10-year floodplain. Remove remaining asphalt, decompact soils of former roads and campsites and re-establish seasonal channels and natural topography that have been filled. Remove Lower River amphitheater structure and fill. Temporarily fence restoration areas to allow for recovery.	Restore topography of 19.7 acres of floodplain. Remove remaining asphalt, decompact soils of former roads and campsites and re-establish seasonal channels that have been filled. Place large box culverts or other design components, such as rolling dips and permeable subgrade, to improve surface water flow. Fence and close the riparian zone at former Upper River to protect the riverbank from trampling.	Restore 35.6 acres of 10-year floodplain. Remove remaining asphalt, decompact soils of former roads and campsites and re-establish seasonal channels and natural topography that have been filled. Remove Lower River amphitheater structure and fill. Temporarily fence restoration areas to allow for recovery.	Restore topography of 19.7 acres of floodplain. Remove remaining asphalt, decompact soils of former roads and campsites and re-establish seasonal channels that have been filled. Place large box culverts or other design components, such as rolling dips and permeable subgrade, to improve surface water flow. Fence and close the riparian zone at former Upper River to protect the riverbank from trampling.
RES-2-022	2	Valley Campgrounds: campsites near the river	The close proximity of campsites to the river and high visitor use has resulted in vegetation trampling and riverbank erosion, impacting both water quality and riparian habitat. This proximity precludes riparian vegetation development.	Remove all campsites within 100' of the bed and banks. Remove asphalt parking spaces, base rock, fill material; decompact soils, recontour and revegetate. Re-direct use to more stable and resilient areas. Erect new fencing or adjust existing fencing to protect the riparian zone.	The close proximity of campsites to the river and high visitor use has resulted in vegetation trampling and riverbank erosion, impacting both water quality and riparian habitat.	Remove all campsites and infrastructure at and all sites within the 100-year floodplain and restore 25.1 acres of floodplain and riparian habitat.	Remove all campsites and infrastructure within 150-foot buffer of the river. Restore 12 acres of riparian habitat. Designate river access point at North Pines campground.	Remove all campsites and infrastructure within 150-foot buffer of the river. Restore 12 acres of riparian habitat. Designate river access point at North Pines campground.	Remove all campsites and infrastructure within 100-foot buffer of the river. Restore 6.5 acres of riparian habitat. Designate river access point at North Pines campground.	Remove all campsites and infrastructure within 100-foot buffer of the river. Restore 6.5 acres of riparian habitat. Designate river access point at North Pines campground.
RES-2-023	2	Housekeeping Camp: riparian restoration and river access	Several Housekeeping Camp units are located in the 2- to 10-year floodplains, impeding hydrologic function. Additionally, high visitor use at the camp has resulted in vegetation trampling and riverbank erosion, impacting both water quality and riparian vegetation. Excess erosion is caused by high flows over parking areas, around tent cabins and down roadways and foot trails.	Focus visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off current eastern river access point located on a steep eroded bank, and actively restore riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.	There are currently 266 units at Housekeeping Camp and are protected by riverbank revetment. Many Housekeeping Camp units are located in the 2- to 10-year floodplain. High visitor use and the close proximity of these units to the riverbank and riparian zone results in denuded riverbanks.	Remove all lodging units and riprap at Housekeeping Camp from within the 100-year floodplain. Restore 16.8 acres of floodplain and riparian ecosystem to natural conditions. Convert area to day use river access (raft put-in) and picnicking.  (CTA) Focus visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off current eastern river access point located on a steep eroded bank, and actively restore riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.	Remove all lodging units and riprap at Housekeeping Camp from within the 100-year floodplain. Restore 16.8 acres of floodplain and riparian ecosystem to natural conditions. Convert area to day use river access (raft put-in) and picnicking.  (CTA) Focus visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off current eastern river access point located on a steep eroded bank, and actively restore riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.	Remove 166 lodging units to restore 10.6 acres of riparian zone. Provide for day use arriving via shuttle.  (CTA) Focus visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off current eastern river access point located on a steep eroded bank, and actively restore riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.	Remove 34 lodging units to restore 1 acre of riparian zone. Provide for day use arriving via shuttle.  (CTA) Focus visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off current eastern river access point located on a steep eroded bank, and actively restore riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.	Remove 34 lodging units to restore 1 acre of riparian zone. Provide for day use arriving via shuttle.  (CTA) Focus visitor use and river access to the two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge. Fence off current eastern river access point located on a steep eroded bank, and actively restore riverbank with brush layering. Where infrastructure is removed, decompact soils and plant riparian species.

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RES-2-024	2	Yosemite Lodge: buildings in the 100-year floodplain	Several buildings in the Yosemite Lodge complex are within the 100-year floodplain. Buildings in this floodplain have the potential to be flooded.		Several buildings in the Yosemite Lodge complex are within the 100-year floodplain.	Remove buildings, decompact soils, recontour topography (using 1919 maps as a guide) and plant native vegetation.	Remove 4 buildings from the 100-year floodplain, in addition to those identified as common to all.	No buildings removed from the 100-year floodplain, except for those identified as common to all.	No buildings removed from the 100-year floodplain, except for those identified as common to all.	Remove buildings, decompact soils, in addition to those identified as common to all; recontour topography (using 1919 maps as a guide) and plant native vegetation. Construct enough parking for the lodging units and restore the remaining area.
RES-2-025	2	Eagle Creek drainage: channelization	Eagle Creek's natural braided morphology has been channelized, affecting the delivery of water to the meadow. A berm has been constructed to protect a parking pull-out from creek flooding.	Remove berm and parking lot abutting Eagle Creek. Add culverts to allow more dispersed water delivery to the Eagle Creek Meadow. Revegetate with native upland species.	The natural braided morphology of Eagle Creek is channelized near Northside Drive. A berm was constructed to protect a parking pull-out from creek flooding.	(CTA) Remove berm and parking lot abutting Eagle Creek. Add culverts to allow more dispersed water delivery to the Eagle Creek Meadow. Revegetate with native upland species.	(CTA) Remove berm and parking lot abutting Eagle Creek. Add culverts to allow more dispersed water delivery to the Eagle Creek Meadow. Revegetate with native upland species.	(CTA) Remove berm and parking lot abutting Eagle Creek. Add culverts to allow more dispersed water delivery to the Eagle Creek Meadow. Revegetate with native upland species.	(CTA) Remove berm and parking lot abutting Eagle Creek. Add culverts to allow more dispersed water delivery to the Eagle Creek Meadow. Revegetate with native upland species.	(CTA) Remove berm and parking lot abutting Eagle Creek. Add culverts to allow more dispersed water delivery to the Eagle Creek Meadow. Revegetate with native upland species.
RES-2-026	2	El Capitan Bridge: River access	High visitor use along sensitive riverbanks near the El Capitan Bridge leads to vegetation trampling and riverbank erosion.	Redirect visitors accessing the river near El Capitan Bridge to resilient sandbar points. Fence and revegetate eroded areas.	There is high visitor use along sensitive riverbanks near the El Capitan Bridge.	(CTA) Redirect visitors accessing the river near El Capitan Bridge to resilient sandbar points. Fence and revegetate eroded areas.	(CTA) Redirect visitors accessing the river near El Capitan Bridge to resilient sandbar points. Fence and revegetate eroded areas.	(CTA) Redirect visitors accessing the river near El Capitan Bridge to resilient sandbar points. Fence and revegetate eroded areas.	(CTA) Redirect visitors accessing the river near El Capitan Bridge to resilient sandbar points. Fence and revegetate eroded areas.	(CTA) Redirect visitors accessing the river near El Capitan Bridge to resilient sandbar points. Fence and revegetate eroded areas.
RES-2-027	2	Valley Swinging Bridge Picnic Area: Effects on Riparian Zone and Visitor Experience	The Swinging Bridge picnic area is negatively affected by high visitor use, exceeding the design of the existing infrastructure. Vegetation trampling and soil compaction has resulted in riparian vegetation loss, river bank erosion, and loss of vegetative cover throughout the picnic area.	Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high water mark. Use fencing to re-direct use across the bridge to the large sandbar on the north and downstream side of Swinging Bridge and designate the area as the river access point. Remove riprap and use bioengineering techniques to rebuild riverbank. Reestablish riparian vegetation.	The Swinging Bridge picnic area sustains high levels of visitor use, exceeding the design of the existing infrastructure. Vegetation trampling and soil compaction has resulted in riparian vegetation loss, river bank erosion, and loss of vegetative cover throughout the picnic area.	(CTA) Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high water mark. Use fencing to re-direct use across the bridge to the large sandbar on the north and downstream side of Swinging Bridge and designate the area as the river access point. Remove riprap and use bioengineering techniques to rebuild riverbank. Reestablish riparian vegetation.	(CTA) Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high water mark. Use fencing to re-direct use across the bridge to the large sandbar on the north and downstream side of Swinging Bridge and designate the area as the river access point. Remove riprap and use bioengineering techniques to rebuild riverbank. Reestablish riparian vegetation.	(CTA) Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high water mark. Use fencing to re-direct use across the bridge to the large sandbar on the north and downstream side of Swinging Bridge and designate the area as the river access point. Remove riprap and use bioengineering techniques to rebuild riverbank. Reestablish riparian vegetation.	(CTA) Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high water mark. Use fencing to re-direct use across the bridge to the large sandbar on the north and downstream side of Swinging Bridge and designate the area as the river access point. Remove riprap and use bioengineering techniques to rebuild riverbank. Reestablish riparian vegetation.	(CTA) Delineate picnic area by fencing and revegetating the river terrace along the riparian zone approximately 50 feet from the ordinary high water mark. Use fencing to re-direct use across the bridge to the large sandbar on the north and downstream side of Swinging Bridge and designate the area as the river access point. Remove riprap and use bioengineering techniques to rebuild riverbank. Reestablish riparian vegetation.
RES-2-028	2	Valley Campgrounds: river access	Campers are accessing areas along the river that are not good river access points. They are not hardened, and the banks are composed of erosive soils with unconsolidated materials. Trees are undercut by trampling around the roots, causing subsequent channel widening due to trees falling into the river.	Direct visitors of Lower and North Pines campgrounds to resilient sandy beaches through signage and campground maps and brochures. There are four sandy beaches in the vicinity of the campgrounds. Fence off vulnerable steep slope and provide signs directing visitors to current access.	Campers are accessing areas along the river that are not good river access points. They are not hardened, and the banks are composed of erosive soils with unconsolidated materials. Trees are undercut by trampling around the roots, then fall into the river, and the river channel is subsequently widened.	(CTA) Direct visitors of Lower and North Pines campgrounds to resilient sandy beaches through signage and campground maps and brochures. There are four sandy beaches in the vicinity of the campgrounds. Fence off vulnerable steep slope and provide signs directing visitors to current access.	(CTA) Direct visitors of Lower and North Pines campgrounds to resilient sandy beaches through signage and campground maps and brochures. There are four sandy beaches in the vicinity of the campgrounds. Fence off vulnerable steep slope and provide signs directing visitors to current access.	(CTA) Direct visitors of Lower and North Pines campgrounds to resilient sandy beaches through signage and campground maps and brochures. There are four sandy beaches in the vicinity of the campgrounds. Fence off vulnerable steep slope and provide signs directing visitors to current access.	(CTA) Direct visitors of Lower and North Pines campgrounds to resilient sandy beaches through signage and campground maps and brochures. There are four sandy beaches in the vicinity of the campgrounds. Fence off vulnerable steep slope and provide signs directing visitors to current access.	(CTA) Direct visitors of Lower and North Pines campgrounds to resilient sandy beaches through signage and campground maps and brochures. There are four sandy beaches in the vicinity of the campgrounds. Fence off vulnerable steep slope and provide signs directing visitors to current access.
RES-2-029	2	Valley Loop Trail: delineation and river access	The Valley Loop Trail is not well delineated, connected or signed. It is hard to find and does not provide explicit river access. Additionally, it is seasonally inaccessible at tributary crossings.	Reconstruct trail and designate river access, such as at Housekeeping Camp, Sentinel Beach, Cathedral Beach, Swinging Bridge, in the southwest area of the former River's Campground, and South of Slaughterhouse Meadow. Re-establish the Valley Loop Trail at Curry Village where it ends.	The Valley Loop Trail is not well delineated or signed. It is hard to locate the trail, and the most appropriate river access points are not demarcated. The trail is inaccessible at tributary crossings during periods of high water.	(CTA) Reconstruct trail and designate river access, such as at Housekeeping Camp, Sentinel Beach, Cathedral Beach, Swinging Bridge, in the southwest area of the former River's Campground, and South of Slaughterhouse Meadow. Re-establish the Valley Loop Trail at Curry Village where it ends.	(CTA) Reconstruct trail and designate river access, such as at Housekeeping Camp, Sentinel Beach, Cathedral Beach, Swinging Bridge, in the southwest area of the former River's Campground, and South of Slaughterhouse Meadow. Re-establish the Valley Loop Trail at Curry Village where it ends.	(CTA) Reconstruct trail and designate river access, such as at Housekeeping Camp, Sentinel Beach, Cathedral Beach, Swinging Bridge, in the southwest area of the former River's Campground, and South of Slaughterhouse Meadow. Re-establish the Valley Loop Trail at Curry Village where it ends.	(CTA) Reconstruct trail and designate river access, such as at Housekeeping Camp, Sentinel Beach, Cathedral Beach, Swinging Bridge, in the southwest area of the former River's Campground, and South of Slaughterhouse Meadow. Re-establish the Valley Loop Trail at Curry Village where it ends.	(CTA) Reconstruct trail and designate river access, such as at Housekeeping Camp, Sentinel Beach, Cathedral Beach, Swinging Bridge, in the southwest area of the former River's Campground, and South of Slaughterhouse Meadow. Re-establish the Valley Loop Trail at Curry Village where it ends.
RES-2-030	2	Yosemite Lodge: former lodge cabin area and volunteer center abandoned infrastructure	Removal of the former Yosemite Lodge cabin after the 1997 flood has left the area with fill and impacts from soil compaction.	Restore 4.5 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins and wellness center, from the western portion of the Lodge complex (those that were lost after the 1997 flood). Remove fill, decompact soils and plant riparian plant species.	Removal of the former Yosemite Lodge units and cabins and wellness center, after the 1997 flood, has left the area with fill and impacts from soil compaction.	(CTA) Restore 4.5 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins and wellness center, from the western portion of the Lodge complex (those that were lost after the 1997 flood). Remove fill, decompact soils and plant riparian plant species.	(CTA) Restore 4.5 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins and wellness center, from the western portion of the Lodge complex (those that were lost after the 1997 flood). Remove fill, decompact soils and plant riparian plant species.	(CTA) Restore 4.5 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins and wellness center, from the western portion of the Lodge complex (those that were lost after the 1997 flood). Remove fill, decompact soils and plant riparian plant species.	(CTA) Restore 4.5 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins and wellness center, from the western portion of the Lodge complex (those that were lost after the 1997 flood). Remove fill, decompact soils and plant riparian plant species.	(CTA) Restore 4.5 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins and wellness center, from the western portion of the Lodge complex (those that were lost after the 1997 flood). Remove fill, decompact soils and plant riparian plant species.

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RES-2-031	2	Sentinel Beach Picnic Area: Effects on Riparian Zone and Visitor Experience	The Sentinel Beach picnic area is negatively affected by high visitor use, exceeding the design of the existing infrastructure. The resulting loss of riparian vegetation contributes to riverbank erosion.	Redesign the picnic area in its current location to accommodate picnicking; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and reestablish riparian vegetation.	The Sentinel Beach Designated Picnic Area is negatively affected by high visitor use, exceeding the design of the existing infrastructure. The resulting loss of riparian vegetation contributes to riverbank erosion.	(CTA) Redesign the picnic area in its current location to accommodate picnicking; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and reestablish riparian vegetation.	(CTA) Redesign the picnic area in its current location to accommodate picnicking; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and reestablish riparian vegetation.	(CTA) Redesign the picnic area in its current location to accommodate picnicking; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and reestablish riparian vegetation.	(CTA) Redesign the picnic area in its current location to accommodate picnicking; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and reestablish riparian vegetation.	(CTA) Redesign the picnic area in its current location to accommodate picnicking; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and reestablish riparian vegetation.
RES-2-032	2	CA-MRP-0046/47/74	Stock trail through sensitive midden deposit and formal hiking trail near a rock art feature impact sensitive cultural resources on archeological site CA-MRP-0046/47/74, located along the Happy Isles Loop Road. Modern graffiti desecrates the rock art boulder.	Re-route stock trail and formal trail off sensitive area, remove graffiti from rock art boulder.	Stock trail through sensitive midden deposit and formal hiking trail near a rock art feature impact sensitive cultural resources on archeological site CA-MRP-0046/47/74, located along the Happy Isles Loop Road. Modern graffiti desecrates the rock art boulder.	(CTA) Re-route stock trail and formal trail off sensitive area, remove graffiti from rock art boulder.	(CTA) Re-route stock trail and formal trail off sensitive area, remove graffiti from rock art boulder.	(CTA) Re-route stock trail and formal trail off sensitive area, remove graffiti from rock art boulder.	(CTA) Re-route stock trail and formal trail off sensitive area, remove graffiti from rock art boulder.	(CTA) Re-route stock trail and formal trail off sensitive area, remove graffiti from rock art boulder.
RES-2-033	2	CA-MRP-0052/H	Stock use and operational staging cause impacts to archeological resources at site CA-MRP-0052/H northeast of the Ahwahnee.	Delineate or reroute bridle path away from site.	Stock use and operational staging cause impacts to archeological resources at site CA-MRP-0052/H northeast of the Ahwahnee.	(CTA) Delineate or reroute bridle path away from site.	(CTA) Delineate or reroute bridle path away from site.	(CTA) Delineate or reroute bridle path away from site.	(CTA) Delineate or reroute bridle path away from site.	(CTA) Delineate or reroute bridle path away from site.
RES-2-034	2	CA-MRP-0055/H	Exceptional site contains rock art and rock shelter features and is currently in good condition. Valley rock shelters attract potential illegal camping/bivy and rock art may be subject to vandalism. Informal trail from highway pullout into site center.	Rehabilitate informal trails and remove parking pullout. Increase LE/archeology monitoring to protect rock shelter/rock art.	Exceptional site contains rock art and rock shelter features and is currently in good condition. Valley rock shelters attract potential illegal camping/bivy and rock art may be subject to vandalism. Informal trail from highway pullout into site center.	(CTA) Rehabilitate informal trails and remove parking pullout. Increase LE/archeology monitoring to protect rock shelter/rock art.	(CTA) Rehabilitate informal trails and remove parking pullout. Increase LE/archeology monitoring to protect rock shelter/rock art.	(CTA) Rehabilitate informal trails and remove parking pullout. Increase LE/archeology monitoring to protect rock shelter/rock art.	(CTA) Rehabilitate informal trails and remove parking pullout. Increase LE/archeology monitoring to protect rock shelter/rock art.	(CTA) Rehabilitate informal trails and remove parking pullout. Increase LE/archeology monitoring to protect rock shelter/rock art.
RES-2-036	2	CA-MRP-0057	Heavily used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling cause impacts to the prehistoric rock shelter and associated artifacts at archeological site CA-MRP-0057 along the Mirror Lake Trail.	Remove graffiti in rock shelter, rehab informal trails. Increase law enforcement/ranger monitoring of rock shelter.	Heavily used formal trails and informal trails, as well as illegal campfires, graffiti, and trampling cause impacts to the prehistoric rock shelter and associated artifacts at archeological site CA-MRP-0057 along the Mirror Lake Trail.	(CTA) Remove graffiti in rock shelter, rehab informal trails. Increase law enforcement/ranger monitoring of rock shelter.	(CTA) Remove graffiti in rock shelter, rehab informal trails. Increase law enforcement/ranger monitoring of rock shelter.	(CTA) Remove graffiti in rock shelter, rehab informal trails. Increase law enforcement/ranger monitoring of rock shelter.	(CTA) Remove graffiti in rock shelter, rehab informal trails. Increase law enforcement/ranger monitoring of rock shelter.	(CTA) Remove graffiti in rock shelter, rehab informal trails. Increase law enforcement/ranger monitoring of rock shelter.
RES-2-037	2	CA-MRP-0062	Parking, rock climbing, camping, vandalism, human waste, fire rings and informal trails are impacting a prehistoric rock shelter and associated artifacts at site CA-MRP-0062 near Devil's Elbow.	Remove the logs and graffiti. Ecologically restore the informal trails and relocate the parking area east, away from the site.	Parking, rock climbing, camping, vandalism, human waste, fire rings and informal trails are impacting a prehistoric rock shelter and associated artifacts at site CA-MRP-0062 near Devil's Elbow.	(CTA) Remove the logs and graffiti. Ecologically restore the informal trails and relocate the parking area east, away from the site.	(CTA) Remove the logs and graffiti. Ecologically restore the informal trails and relocate the parking area east, away from the site.	(CTA) Remove the logs and graffiti. Ecologically restore the informal trails and relocate the parking area east, away from the site.	(CTA) Remove the logs and graffiti. Ecologically restore the informal trails and relocate the parking area east, away from the site.	(CTA) Remove the logs and graffiti. Ecologically restore the informal trails and relocate the parking area east, away from the site.
RES-2-038	2	CA-MRP-0076	Site recording not to current standards. Impacts: informal trails, climbing on Feature 2 (Taft Toe bouldering area). Midden, lithics not relocated since original recording, probably because of heavy surface impacts.	Rehabilitate social trails and prohibit climbing on Feature 2.	Site recording not to current standards. Impacts: informal trails, climbing on Feature 2 (Taft Toe bouldering area). Midden, lithics not relocated since original recording, probably because of heavy surface impacts.	(CTA) Rehabilitate social trails and prohibit climbing on Feature 2.	(CTA) Rehabilitate social trails and prohibit climbing on Feature 2.	(CTA) Rehabilitate social trails and prohibit climbing on Feature 2.	(CTA) Rehabilitate social trails and prohibit climbing on Feature 2.	(CTA) Rehabilitate social trails and prohibit climbing on Feature 2.
RES-2-039	2	CA-MRP-0080	Camping, trampling, and trash are causing impacts to bedrock mortars (pounding rocks) at site CA-MRP-0080 in the 200 Loop of Upper Pines Campground. Impacts to these important archeological features affects continuing use and association with these culturally significant resources.	Remove campsite 208 and bear box; reroute bathroom foot traffic away from milling feature and fence off.	Camping, trampling, and trash are causing impacts to bedrock mortars (pounding rocks) at site CA-MRP-0080 in the 200 Loop of Upper Pines Campground. Impacts to these important archeological features affects continuing use and association with these culturally significant resources.	(CTA) Remove campsite 208 and bear box; reroute bathroom foot traffic away from milling feature and fence off.	(CTA) Remove campsite 208 and bear box; reroute bathroom foot traffic away from milling feature and fence off.	(CTA) Remove campsite 208 and bear box; reroute bathroom foot traffic away from milling feature and fence off.	(CTA) Remove campsite 208 and bear box; reroute bathroom foot traffic away from milling feature and fence off.	(CTA) Remove campsite 208 and bear box; reroute bathroom foot traffic away from milling feature and fence off.

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RES-2-040	2	CA-MRP-0082/H	Rock climbing activities (“bolt ladder”) in the rock shelter boulder at Le Conte Memorial Lodge cause trampling of the near surface archeological deposit at CA-MRP-0082/H.	Remove climbing bolts from rock shelter boulder. Increase interpretation/education/outreach effort for climbers. Prohibit climbing at the Rock Shelter Boulder.	Rock climbing activities (“bolt ladder”) in the rock shelter boulder at Le Conte Memorial Lodge cause trampling of the near surface archeological deposit at CA-MRP-0082/H.	(CTA) Remove climbing bolts from rock shelter boulder. Increase interpretation/education/outreach effort for climbers. Prohibit climbing at the Rock Shelter Boulder.	(CTA) Remove climbing bolts from rock shelter boulder. Increase interpretation/education/outreach effort for climbers. Prohibit climbing at the Rock Shelter Boulder.	(CTA) Remove climbing bolts from rock shelter boulder. Increase interpretation/education/outreach effort for climbers. Prohibit climbing at the Rock Shelter Boulder.	(CTA) Remove climbing bolts from rock shelter boulder. Increase interpretation/education/outreach effort for climbers. Prohibit climbing at the Rock Shelter Boulder.	(CTA) Remove climbing bolts from rock shelter boulder. Increase interpretation/education/outreach effort for climbers. Prohibit climbing at the Rock Shelter Boulder.
RES-2-041	2	CA-MRP-0158/309	Rock climbing (bouldering) activities on a rock art boulder and informal trails impact the archeological and ethnographic resources at CA-MRP-0158/309 located along the Northside Drive stretch of the Yosemite Valley Loop Trail.	Rehabilitate informal trails and prohibit climbing on rock art boulder. Increase interpretation/education/outreach effort for climbers.	Rock climbing (bouldering) activities on a rock art boulder and informal trails impact the archeological and ethnographic resources at CA-MRP-0158/309 located along the Northside Drive stretch of the Yosemite Valley Loop Trail.	(CTA) Rehabilitate informal trails and prohibit climbing on rock art boulder. Increase interpretation/education/outreach effort for climbers.	(CTA) Rehabilitate informal trails and prohibit climbing on rock art boulder. Increase interpretation/education/outreach effort for climbers.	(CTA) Rehabilitate informal trails and prohibit climbing on rock art boulder. Increase interpretation/education/outreach effort for climbers.	(CTA) Rehabilitate informal trails and prohibit climbing on rock art boulder. Increase interpretation/education/outreach effort for climbers.	(CTA) Rehabilitate informal trails and prohibit climbing on rock art boulder. Increase interpretation/education/outreach effort for climbers.
RES-2-042	2	CA-MRP-0190/191	Vehicular and bike traffic along a dirt access road in Backpackers Campground affects surface and subsurface archeological resources at CA-MRP-0190/0191.	Delineate trail/bike path to limit shoulder access within site.	Vehicular and bike traffic along a dirt access road in Backpackers Campground affects surface and subsurface archeological resources at CA-MRP-0190/0191.	(CTA) Delineate trail/bike path to limit shoulder access within site.	(CTA) Delineate trail/bike path to limit shoulder access within site.	(CTA) Delineate trail/bike path to limit shoulder access within site.	(CTA) Delineate trail/bike path to limit shoulder access within site.	(CTA) Delineate trail/bike path to limit shoulder access within site.
RES-2-043	2	CA-MRP-0240/303/H	Non-technical climbing on a large bedrock mortar (pounding rock) at Lower Yosemite Falls causes impacts to the archeological resource at site CA-MRP-0240/0303/H. This type of visitor use on the bedrock mortar affects continuing use and association with these culturally significant resources.	Fence off/close access to large bedrock mortar (pounding rock) next to trail.	Non-technical climbing on a large bedrock mortar (pounding rock) at Lower Yosemite Falls causes impacts to the archeological resource at site CA-MRP-0240/0303/H. This type of visitor use on the bedrock mortar affects continuing use and association with these culturally significant resources.	(CTA) Fence off/close access to large bedrock mortar (pounding rock) next to trail.	(CTA) Fence off/close access to large bedrock mortar (pounding rock) next to trail.	(CTA) Fence off/close access to large bedrock mortar (pounding rock) next to trail.	(CTA) Fence off/close access to large bedrock mortar (pounding rock) next to trail.	(CTA) Fence off/close access to large bedrock mortar (pounding rock) next to trail.
RES-2-045	2	Ethnographic ORV - Impacts to traditionally used plant populations	Threats to traditionally used plant populations include invasive species such as Himalayan Blackberry ( <i>Rubus discolor</i> ), drainage and hydrology impacts to meadows, encroachment of conifers in black oak habitat, and erosion and revegetations that affect riparian vegetation.	The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program will address impacts to some traditionally used plant populations in some locations. Conifers that are overtopping black oaks would also be considered for removal.	Threats to traditionally used plant populations include invasive species such as Himalayan Blackberry ( <i>Rubus discolor</i> ), drainage and hydrology impacts to meadows, and erosion and revegetations that affect riparian vegetation.	(CTA) The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program will address impacts to some traditionally used plant populations in some locations. Conifers that are overtopping black oaks would also be considered for removal.	(CTA) The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program will address impacts to some traditionally used plant populations in some locations. Conifers that are overtopping black oaks would also be considered for removal.	(CTA) The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program will address impacts to some traditionally used plant populations in some locations. Conifers that are overtopping black oaks would also be considered for removal.	(CTA) The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program will address impacts to some traditionally used plant populations in some locations. Conifers that are overtopping black oaks would also be considered for removal.	(CTA) The ecological restoration actions associated with this planning effort implemented in concert with the existing invasive plant management program will address impacts to some traditionally used plant populations in some locations. Conifers that are overtopping black oaks would also be considered for removal.
RES-2-049	2	CA-MRP-0181/H	Abandoned infrastructure located on CA-MRP-0181/H in Rancheria impact an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians.	In recognition of the high cultural significance of CA-MRP-0181/H for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.	Abandoned infrastructure located on CA-MRP-0181/H in Rancheria impact an exceptional site containing diverse components and extremely sensitive cultural materials that are highly valued by traditionally associated American Indians.	(CTA) In recognition of the high cultural significance of CA-MRP-0181/H for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.	(CTA) In recognition of the high cultural significance of CA-MRP-0181/H for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.	(CTA) In recognition of the high cultural significance of CA-MRP-0181/H for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.	(CTA) In recognition of the high cultural significance of CA-MRP-0181/H for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.	(CTA) In recognition of the high cultural significance of CA-MRP-0181/H for traditionally associated American Indians, the site will be protected from any further development. A plan of action for addressing the abandoned infrastructure on the site will be developed in consultation with traditionally associated American Indian tribes and groups. Any solution(s) developed will also include a recommended approach for deterring visitor use within the site.
RES-2-050	2	Former Bridalveil Sewer Plant	Lasting impacts from the former Bridalveil sewer plant are still evident. Remaining underground infrastructure affects hydrology and fill material precludes recruitment of desirable native plants in black oak community, affecting the ethnographic ORV.	Remove the buried structure, including piping on both sides of the river, and add fill if needed. Cover with native topsoil and revegetate with native plants.	Impacts from the former Bridalveil sewer plant are still evident in Bridalveil Meadow.	(CTA) Remove the buried structure, including piping on both sides of the river, and add fill if needed. Cover with native topsoil and revegetate with native plants.	(CTA) Remove the buried structure, including piping on both sides of the river, and add fill if needed. Cover with native topsoil and revegetate with native plants.	(CTA) Remove the buried structure, including piping on both sides of the river, and add fill if needed. Cover with native topsoil and revegetate with native plants.	(CTA) Remove the buried structure, including piping on both sides of the river, and add fill if needed. Cover with native topsoil and revegetate with native plants.	(CTA) Remove the buried structure, including piping on both sides of the river, and add fill if needed. Cover with native topsoil and revegetate with native plants.

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RES-2-052	2	Sugar Pine Bridge and Ahwahnee Bridge and Road Berm: free flowing condition	The historic Sugar Pine Bridge is constricting the free-flowing condition of the Merced River and causing localized impacts to hydrologic function. The Ahwahnee Bridge is also constricting river flow.		The historic Sugar Pine and Ahwahnee bridges and the road berm that connects them are hydrologically constricting the Merced River.	Remove the Ahwahnee and Sugar Pine bridges, and the associated berm and restore to natural conditions. Re-route the multiple use trail to the north bank of the river. Reroute utilities under Ahwahnee Bridge. Manually cut pieces of the bridge into smaller sections. Remove bridges with heavy equipment (crane lifts sections or chunks). Pontoon rafts below the bridge would catch debris. All work from the banks would use a reach an excavator to remove chunks of bridge. Footings were removed with excavators from the bank. The removal would occur during low flow in late Summer or early Fall (no work after Oct. 31 due to the potential for high water events occurring).	Remove the Ahwahnee and Sugar Pine bridges, and the associated berm and restore to natural conditions. Reroute the multiple use trail to the north bank of the river. Reroute utilities under Ahwahnee Bridge. Manually cut pieces of the bridge into smaller sections. Remove bridges with heavy equipment (crane lifts sections or chunks). Pontoon rafts below the bridge would catch debris. All work from the banks would use a reach an excavator to remove chunks of bridge. Footings were removed with excavators from the bank. The removal would occur during low flow in late Summer or early Fall (no work after Oct. 31 due to the potential for high water events occurring).	Remove the Ahwahnee and Sugar Pine bridges, and the associated berm and restore to natural conditions. Reroute the multiple use trail to the north bank of the river. Reroute utilities under Ahwahnee Bridge. Manually cut pieces of the bridge into smaller sections. Remove bridges with heavy equipment (crane lifts sections or chunks). Pontoon rafts below the bridge would catch debris. All work from the banks would use a reach an excavator to remove chunks of bridge. Footings were removed with excavators from the bank. The removal would occur during low flow in late Summer or early Fall (no work after Oct. 31 due to the potential for high water events occurring).	Remove the Sugar Pine Bridge and berm. At the Ahwahnee Bridge, heading south toward the Lower Pines campground, connect a trail and small bridge going over the cut-off channel. Additionally, re-route the multiple use trail to the north bank of the river. Manually cut pieces of the bridge into smaller sections. Remove bridges with heavy equipment (crane lifts sections or chunks). Pontoon rafts below the bridge would catch debris. All work from the banks would use a reach an excavator to remove chunks of bridge. Footings were removed with excavators from the bank. The removal would occur during low flow in late Summer or early Fall (no work after Oct. 31 due to the potential for high water events occurring).the river, going towards Mirror Lake.	Retain all historic bridges. Improve riverbank condition at Sugar Pine and Ahwahnee Bridges by increasing channel complexity through construction of constructed log jams, strategic placement of large wood, removal of rip rap, and bioengineering of the riverbank. Reduce the width of the cut-off channel upstream of Sugar Pine bridge through a combination of fill, constructed log jams, and bioengineered bank stabilization. If subsequent monitoring of riparian condition reveals insufficient improvement (i.e. CRAM rating remains below 0.71) within 10 years of the implementation of these actions, more aggressive management action may be initiated, including the possible removal of Sugar Pine Bridge.
RES-2-053	2	Stoneman Bridge: free flowing condition	The historic Stoneman Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.		The historic Stoneman Bridge has footings within the bed and banks of the Merced River and is hydrologically constricting the river.	Remove bridge and restore to natural conditions, make Southside Drive two-way, and redesign Sentinel intersection.	Remove bridge and restore to natural conditions, make Southside Drive two-way, and redesign Sentinel intersection.	Mitigate effects of bridge through constructed solutions. Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam. Add culverts along Northside Drive to improve drainage.	Mitigate effects of bridge through constructed solutions. Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam. Add culverts along Northside Drive to improve drainage.	Mitigate effects of bridge through constructed solutions. Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam. Add culverts along Northside Drive to improve drainage.
RES-2-054	2	Clark's Bridge: free flowing condition	Clark's Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	The Clark's Bridge constricts hydrologic flows of the Merced River.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.
RES-2-056	2	Happy Isles former footbridge footings: free flowing condition	The former footbridge restricts free-flowing condition due to the presence of abutments and gage base in the river.	Remove former footings and the former river gauge base from the bed and banks of the river. Revegetate denuded informal trails.	Abutments and gage base of the former footbridge are located within in the bed and banks of the Merced River.	(CTA) Remove former footings and the former river gauge base from the bed and banks of the river. Revegetate denuded informal trails.	(CTA) Remove former footings and the former river gauge base from the bed and banks of the river. Revegetate denuded informal trails.	(CTA) Remove former footings and the former river gauge base from the bed and banks of the river. Revegetate denuded informal trails.	(CTA) Remove former footings and the former river gauge base from the bed and banks of the river. Revegetate denuded informal trails.	(CTA) Remove former footings and the former river gauge base from the bed and banks of the river. Revegetate denuded informal trails.
RES-2-057	2	Pohono Bridge: abandoned gauging station	The antiquated gauging station infrastructure within the bed and banks of the river is unnecessary with current technology and can be removed.	Move the gauging station north of the river outside of the bed and banks of the river. Revegetate denuded areas.	There is unused and antiquated infrastructure associated with the gauge station within the bed and banks of the river.	(CTA) Move the gauging station north of the river outside of the bed and banks of the river. Revegetate denuded areas.	(CTA) Move the gauging station north of the river outside of the bed and banks of the river. Revegetate denuded areas.	(CTA) Move the gauging station north of the river outside of the bed and banks of the river. Revegetate denuded areas.	(CTA) Move the gauging station north of the river outside of the bed and banks of the river. Revegetate denuded areas.	(CTA) Move the gauging station north of the river outside of the bed and banks of the river. Revegetate denuded areas.
RES-2-058	2	Road bridge at Happy Isles: free flowing condition	The road bridge at Happy Isles has footings within the bed and banks of the Merced River, which serve as an impediment to hydrologic flows.	Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	The road bridge at Happy Isles has footings within the bed and banks of the Merced River, which serve as an impediment to hydrologic flows.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.
RES-2-059	2	Sentinel Bridge: free flowing condition	Sentinel Bridge is impacting the free flowing condition of the Merced River by constricting flow within the bed and banks.	Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	Sentinel Bridge constricts hydrologic flows of the Merced River.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.	(CTA) Place large wood to lessen the scouring from the bridge. Use brush layering and place an constructed log jam.
RES-2-060	2	Valley Swinging Bridge: free flowing condition	Swinging Bridge and associated revetments impact the free-flowing condition of the Merced River.	Redesign the picnic area in its current location to better accommodate visitor use levels at this picnic area; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and re-establish riparian vegetation.	The bridge has footings in the bed and banks of the river, which serve as an impediment to hydrologic flows.	(CTA) Redesign the picnic area in its current location to better accommodate visitor use levels at this picnic area; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and re-establish riparian vegetation.	(CTA) Redesign the picnic area in its current location to better accommodate visitor use levels at this picnic area; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and re-establish riparian vegetation.	(CTA) Redesign the picnic area in its current location to better accommodate visitor use levels at this picnic area; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and re-establish riparian vegetation.	(CTA) Redesign the picnic area in its current location to better accommodate visitor use levels at this picnic area; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and re-establish riparian vegetation.	(CTA) Redesign the picnic area in its current location to better accommodate visitor use levels at this picnic area; formalize vehicle access and parking; designate formal river access. Fence off sensitive areas, re-direct use to more resilient areas and re-establish riparian vegetation.

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RES-2-061	2	Sentinel Beach Picnic Area to El Capitan Moraine: Channel complexity	Loss of the El Capitan moraine as well as resulting channel incision upstream has reduced frequency of inundation within the riparian zone, meadows and floodplain. This results in decreased topographic complexity and poorly developed riparian vegetation.	To enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would include willow planting, brush layering, uninhibited accumulation and strategic placement of large wood.	The river reach upstream of the El Capitan moraine to the Sentinel picnic area lacks channel complexity and large wood.	(CTA) To enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would include willow planting, brush layering, uninhibited accumulation and strategic placement of large wood.	(CTA) To enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would include willow planting, brush layering, uninhibited accumulation and strategic placement of large wood.	(CTA) To enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would include willow planting, brush layering, uninhibited accumulation and strategic placement of large wood.	(CTA) To enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would include willow planting, brush layering, uninhibited accumulation and strategic placement of large wood.	(CTA) To enhance channel complexity in the river reach upstream of the El Capitan moraine to the Sentinel picnic area, localized restoration would include willow planting, brush layering, uninhibited accumulation and strategic placement of large wood.
RES-2-062	2	River reach between Clark's and Sentinel Bridges: highly impacted riverbanks	Between Clark's and Sentinel Bridges, the river lacks complexity and is impacted. In some places along this reach, it is more than twice its historic width and shallower than historically.	Place eight constructed log jams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Log jams would be designed to look natural, without straight-cut edges and with root wads remaining. Incorporate brush-layering and re-vegetation to repair localized riverbank erosion.	Between Clark's and Sentinel Bridges, the river channel lacks complexity, and is shallow and wide.	(CTA) Place eight constructed log jams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Log jams would be designed to look natural, without straight-cut edges and with root wads remaining. Incorporate brush-layering and re-vegetation to repair localized riverbank erosion.	(CTA) Place eight constructed log jams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Log jams would be designed to look natural, without straight-cut edges and with root wads remaining. Incorporate brush-layering and re-vegetation to repair localized riverbank erosion.	(CTA) Place eight constructed log jams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Log jams would be designed to look natural, without straight-cut edges and with root wads remaining. Incorporate brush-layering and re-vegetation to repair localized riverbank erosion.	(CTA) Place eight constructed log jams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Log jams would be designed to look natural, without straight-cut edges and with root wads remaining. Incorporate brush-layering and re-vegetation to repair localized riverbank erosion.	(CTA) Place eight constructed log jams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Log jams would be designed to look natural, without straight-cut edges and with root wads remaining. Incorporate brush-layering and re-vegetation to repair localized riverbank erosion.
RES-2-063	2	Clark's Bridge to El Cap Bridge: large wood management	Long-term removal of large wood from the river between Clark's Bridge to El Cap Bridge has reduced channel complexity and compromised riparian structure and aquatic habitat.	Manage large wood according to the 2012 "Management of Fallen Trees in the Merced River in Yosemite Valley" policy. Trees that fall into the river will be retained in the river. Large wood may be minimally manipulated to protect critical infrastructure, to ensure visitor safety, and to prevent unnatural accumulation of wood due to bridges.	Large woody debris (LWD) has been removed from the river between Clark's Bridge to El Cap Bridge for decades.	(CTA) Manage large wood according to the 2012 "Management of Fallen Trees in the Merced River in Yosemite Valley" policy. Trees that fall into the river will be retained in the river. Large wood may be minimally manipulated to protect critical infrastructure, to ensure visitor safety, and to prevent unnatural accumulation of wood due to bridges.	(CTA) Manage large wood according to the 2012 "Management of Fallen Trees in the Merced River in Yosemite Valley" policy. Trees that fall into the river will be retained in the river. Large wood may be minimally manipulated to protect critical infrastructure, to ensure visitor safety, and to prevent unnatural accumulation of wood due to bridges.	(CTA) Manage large wood according to the 2012 "Management of Fallen Trees in the Merced River in Yosemite Valley" policy. Trees that fall into the river will be retained in the river. Large wood may be minimally manipulated to protect critical infrastructure, to ensure visitor safety, and to prevent unnatural accumulation of wood due to bridges.	(CTA) Manage large wood according to the 2012 "Management of Fallen Trees in the Merced River in Yosemite Valley" policy. Trees that fall into the river will be retained in the river. Large wood may be minimally manipulated to protect critical infrastructure, to ensure visitor safety, and to prevent unnatural accumulation of wood due to bridges.	(CTA) Manage large wood according to the 2012 "Management of Fallen Trees in the Merced River in Yosemite Valley" policy. Trees that fall into the river will be retained in the river. Large wood may be minimally manipulated to protect critical infrastructure, to ensure visitor safety, and to prevent unnatural accumulation of wood due to bridges.
RES-2-065	2	Pohono Bridge to the Big Oak Flat Road/El Portal Road intersection: river access and roadside parking	The segment of the El Portal Road between Pohono Bridge and the intersection of the Big Oak Flat Road has a number of non-delineated, dirt roadside pullouts. There are no designated river access points in this reach. Visitor use of these informal pull-outs along the river has resulted in substantial informal trailing, riverbank erosion and loss of riparian vegetation. Visitor experience and resource protection are not optimal for accessing the river in this area.	Pave and formalize 5 roadside pull-outs on El Portal Road. Install curbing in 4 pull-outs and along El Portal Road. Formalize river access in other sensitive areas. Decompact soil and revegetate with riparian species, including willow. Also, install drainage improvements and head walls at 12 locations.	The segment of the El Portal Road between Pohono Bridge and the intersection of the Big Oak Flat Road has a number of non-delineated, dirt roadside pull-outs. There are no designated river access points in this reach. Visitor use of these informal pull-outs along the river has resulted in substantial informal trailing, riverbank erosion and loss of riparian vegetation. Visitor experience and resource protection are not optimal for accessing the river in this area.	CTA: Pave and formalize 5 roadside pull-outs for river access between Pohono Bridge and the intersection of the Big Oak Flat Road . Install curbing along pull-outs and along El Portal Road to prevent further encroachment towards the river and associated resource damage . Completely remove one pull-out that is not protective of resources. In the areas that require ecological restoration following parking and river access formalization, decompact soil and revegetate with riparian species, including willow. Install drainage improvements and head walls at 11 locations.	CTA: Pave and formalize 5 roadside pull-outs for river access between Pohono Bridge and the intersection of the Big Oak Flat Road . Install curbing along pull-outs and along El Portal Road to prevent further encroachment towards the river and associated resource damage . Completely remove one pull-out that is not protective of resources. In the areas that require ecological restoration following parking and river access formalization, decompact soil and revegetate with riparian species, including willow. Install drainage improvements and head walls at 11 locations.	CTA: Pave and formalize 5 roadside pull-outs for river access between Pohono Bridge and the intersection of the Big Oak Flat Road . Install curbing along pull-outs and along El Portal Road to prevent further encroachment towards the river and associated resource damage . Completely remove one pull-out that is not protective of resources. In the areas that require ecological restoration following parking and river access formalization, decompact soil and revegetate with riparian species, including willow. Install drainage improvements and head walls at 11 locations.	CTA: Pave and formalize 5 roadside pull-outs for river access between Pohono Bridge and the intersection of the Big Oak Flat Road . Install curbing along pull-outs and along El Portal Road to prevent further encroachment towards the river and associated resource damage . Completely remove one pull-out that is not protective of resources. In the areas that require ecological restoration following parking and river access formalization, decompact soil and revegetate with riparian species, including willow. Install drainage improvements and head walls at 11 locations.	CTA: Pave and formalize 5 roadside pull-outs for river access between Pohono Bridge and the intersection of the Big Oak Flat Road . Install curbing along pull-outs and along El Portal Road to prevent further encroachment towards the river and associated resource damage . Completely remove one pull-out that is not protective of resources. In the areas that require ecological restoration following parking and river access formalization, decompact soil and revegetate with riparian species, including willow. Install drainage improvements and head walls at 11 locations.
RES-2-068	2	161; Ahwahnee Dining Room	Encroaching trees are filling in the area between the hotel dining room and village, affecting view toward Yosemite Falls.	Selectively clear foreground to maintain views from inside building	Encroaching trees are filling in the area between the hotel dining room and village, affecting view toward Yosemite Falls.	(CTA) Selectively clear foreground to maintain views from inside building	(CTA) Selectively clear foreground to maintain views from inside building	(CTA) Selectively clear foreground to maintain views from inside building	(CTA) Selectively clear foreground to maintain views from inside building	(CTA) Selectively clear foreground to maintain views from inside building
RES-2-069	2	159; Ahwahnee Lounge	Views from inside the building, out to the river corridor and across meadows, are subject to change from encroaching conifers.	Selectively thin conifers to maintain views from inside building	Views from inside the building, out to the river corridor and across meadows, are subject to change from encroaching conifers.	(CTA) Selectively thin conifers to maintain views from inside building	(CTA) Selectively thin conifers to maintain views from inside building	(CTA) Selectively thin conifers to maintain views from inside building	(CTA) Selectively thin conifers to maintain views from inside building	(CTA) Selectively thin conifers to maintain views from inside building

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RES-2-070	2	10; Ahwahnee Meadow, Northside Drive	Park visitors enjoy views toward Yosemite Falls, North Dome, Royal Arches, and Castle Cliffs. Fast-growing conifers are encroaching on existing meadows, obscuring views.	Remove encroaching conifers from oak woodland and meadow to open view of distant features	Park visitors enjoy views toward Yosemite Falls, North Dome, Royal Arches, and Castle Cliffs. Fast-growing conifers are encroaching on existing meadows, obscuring views.	(CTA) Remove encroaching conifers from oak woodland and meadow to open view of distant features	(CTA) Remove encroaching conifers from oak woodland and meadow to open view of distant features	(CTA) Remove encroaching conifers from oak woodland and meadow to open view of distant features	(CTA) Remove encroaching conifers from oak woodland and meadow to open view of distant features	(CTA) Remove encroaching conifers from oak woodland and meadow to open view of distant features
RES-2-071	2	227; Ahwahnee Meadow, Peeling Domes	Park visitors enjoy views toward Half Dome, Royal Arches, Glacier Point. Fast-growing conifers are encroaching on existing meadows, obscuring views.	Monitor conditions and maintain distant views	Park visitors enjoy views toward Half Dome, Royal Arches, Glacier Point. Fast-growing conifers are encroaching on existing meadows, obscuring views.	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views
RES-2-072	2	160; Ahwahnee Solarium	Trees encroaching on the Ahwahnee Meadow are affecting views from the building's interior toward Glacier Point.	Selectively thin conifers to maintain views from inside building. Leave oaks due to their protection as an ethnographic ORV.	Trees encroaching on the Ahwahnee Meadow are affecting views from the building's interior toward Glacier Point.	(CTA) Selectively thin conifers to maintain views from inside building. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively thin conifers to maintain views from inside building. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively thin conifers to maintain views from inside building. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively thin conifers to maintain views from inside building. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively thin conifers to maintain views from inside building. Leave oaks due to their protection as an ethnographic ORV.
RES-2-073	2	228; Ahwahnee Winter Club Room	Trees encroaching on open space outside the building are affecting middle ground views from the building's interior.	Monitor conditions and maintain distant views	Trees encroaching on open space outside the building are affecting middle ground views from the building's interior.	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views
RES-2-075	2	37; Bridalveil Fall footbridge	Views of the fall are limited by encroachment of conifers upon the riparian corridor.	Selectively thin conifers to maintain nearby view	Views of the fall are limited by encroachment of conifers upon the riparian corridor.	(CTA) Selectively thin conifers to maintain nearby view	(CTA) Selectively thin conifers to maintain nearby view	(CTA) Selectively thin conifers to maintain nearby view	(CTA) Selectively thin conifers to maintain nearby view	(CTA) Selectively thin conifers to maintain nearby view
RES-2-076	2	34; Bridalveil Fall hanging valley	From a trail, visitors see Bridalveil Fall, El Capitan, Cathedral Rocks. Increasing densities of tree growth have changed these views over time.	Thin conifers to maintain nearby and distant views	From a trail, visitors see Bridalveil Fall, El Capitan, Cathedral Rocks. Increasing densities of tree growth have changed these views over time.	(CTA) Thin conifers to maintain nearby and distant views	(CTA) Thin conifers to maintain nearby and distant views	(CTA) Thin conifers to maintain nearby and distant views	(CTA) Thin conifers to maintain nearby and distant views	(CTA) Thin conifers to maintain nearby and distant views
RES-2-077	2	43; Bridalveil Meadow	Conifer growth is limiting the view of Ribbon Fall from a roadside stop on Southside Drive.	Selectively thin conifers to open view of Ribbon Fall	Conifer growth is limiting the view of Ribbon Fall from a roadside stop on Southside Drive.	(CTA) Selectively thin conifers to open view of Ribbon Fall	(CTA) Selectively thin conifers to open view of Ribbon Fall	(CTA) Selectively thin conifers to open view of Ribbon Fall	(CTA) Selectively thin conifers to open view of Ribbon Fall	(CTA) Selectively thin conifers to open view of Ribbon Fall
RES-2-078	2	38; Bridalveil Straight	Visitors enjoy views of Half Dome, Cathedral Rocks, El Capitan, and Ribbon Fall from the roadside. Foreground views are being disturbed by foot traffic through grasslands.	Restore grassland and oak habitat in foreground to view of El Capitan	Visitors enjoy views of Half Dome, Cathedral Rocks, El Capitan, and Ribbon Fall from the roadside. Foreground views are being disturbed by foot traffic through grasslands.	(CTA) Restore grassland and oak habitat in foreground to view of El Capitan	(CTA) Restore grassland and oak habitat in foreground to view of El Capitan	(CTA) Restore grassland and oak habitat in foreground to view of El Capitan	(CTA) Restore grassland and oak habitat in foreground to view of El Capitan	(CTA) Restore grassland and oak habitat in foreground to view of El Capitan
RES-2-079	2	40; Cathedral Beach El Cap	Existing picnic area at the river's edge provides a nearby view of El Capitan, threatened in the long term by increasing density of forest growth.	Selectively thin conifers to maintain views of El Capitan	Existing picnic area at the river's edge provides a nearby view of El Capitan, threatened in the long term by increasing density of forest growth.	(CTA) Selectively thin conifers to maintain views of El Capitan	(CTA) Selectively thin conifers to maintain views of El Capitan	(CTA) Selectively thin conifers to maintain views of El Capitan	(CTA) Selectively thin conifers to maintain views of El Capitan	(CTA) Selectively thin conifers to maintain views of El Capitan
RES-2-080	2	20; Chapel	Visitors see Yosemite Falls across Leidig Meadow, but the view is threatened in the long term by the encroachment of conifers.	Selectively thin conifers to open view of Lower Yosemite Fall	Visitors see Yosemite Falls across Leidig Meadow, but the view is threatened in the long term by the encroachment of conifers.	(CTA) Selectively thin conifers to open view of Lower Yosemite Fall	(CTA) Selectively thin conifers to open view of Lower Yosemite Fall	(CTA) Selectively thin conifers to open view of Lower Yosemite Fall	(CTA) Selectively thin conifers to open view of Lower Yosemite Fall	(CTA) Selectively thin conifers to open view of Lower Yosemite Fall
RES-2-081	2	11; Church Bowl picnic area	The site provides opportunities to view landmarks to the east, such as Half Dome, Starr King and Glacier Point across the Ahwahnee Meadow.	Encroaching conifers impinge view of landmarks to the east, including Half Dome, Glacier Point, Starr King across the Ahwahnee Meadow.	The site provides opportunities to view landmarks to the east, such as Half Dome, Starr King and Glacier Point across the Ahwahnee Meadow.	(CTA) Encroaching conifers impinge view of landmarks to the east, including Half Dome, Glacier Point, Starr King across the Ahwahnee Meadow.	(CTA) Encroaching conifers impinge view of landmarks to the east, including Half Dome, Glacier Point, Starr King across the Ahwahnee Meadow.	(CTA) Encroaching conifers impinge view of landmarks to the east, including Half Dome, Glacier Point, Starr King across the Ahwahnee Meadow.	(CTA) Encroaching conifers impinge view of landmarks to the east, including Half Dome, Glacier Point, Starr King across the Ahwahnee Meadow.	(CTA) Encroaching conifers impinge view of landmarks to the east, including Half Dome, Glacier Point, Starr King across the Ahwahnee Meadow.
RES-2-082	2	7; Clark's Bridge	The bridge provides downstream views for motorists and pedestrians. The river's edges have been affected by daily recreational use and erosion at North Pines and Lower Pines campgrounds.	Repair riverbank erosion and thin conifers to open view of Merced River and distant features.	The bridge provides downstream views for motorists and pedestrians. The river's edges have been affected by daily recreational use and erosion at North Pines and Lower Pines campgrounds.	(CTA) Repair riverbank erosion and thin conifers to open view of Merced River and distant features.	(CTA) Repair riverbank erosion and thin conifers to open view of Merced River and distant features.	(CTA) Repair riverbank erosion and thin conifers to open view of Merced River and distant features.	(CTA) Repair riverbank erosion and thin conifers to open view of Merced River and distant features.	(CTA) Repair riverbank erosion and thin conifers to open view of Merced River and distant features.
RES-2-083	2	2; Cooks Meadow, south boardwalk	Conifers are encroaching upon open vistas across the existing meadow and views of Yosemite Falls, Sentinel Rock, North Dome and Glacier Point.	Selectively remove encroaching conifers to maintain views of distant features	Conifers are encroaching upon open vistas across the existing meadow and views of Yosemite Falls, Sentinel Rock, North Dome and Glacier Point.	(CTA) Selectively remove encroaching conifers to maintain views of distant features	(CTA) Selectively remove encroaching conifers to maintain views of distant features	(CTA) Selectively remove encroaching conifers to maintain views of distant features	(CTA) Selectively remove encroaching conifers to maintain views of distant features	(CTA) Selectively remove encroaching conifers to maintain views of distant features



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RES-2-084	2	46; Curry amphitheater	From a gathering spot in the heart of the village, views of Half Dome, Royal Arches, Washington Column and Glacier Point are limited by conifer growth.	Selectively thin conifers to maintain distant views	From a gathering spot in the heart of the village, views of Half Dome, Royal Arches, Washington Column and Glacier Point are limited by conifer growth.	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views
RES-2-086	2	27; Curry Village Parking Area	Conifers growth has the potential to block views of Half Dome from the parking area.	Thin conifers to maintain views of Half Dome	Conifers growth has the potential to block views of Half Dome from the parking area.	(CTA) Thin conifers to maintain views of Half Dome	(CTA) Thin conifers to maintain views of Half Dome	(CTA) Thin conifers to maintain views of Half Dome	(CTA) Thin conifers to maintain views of Half Dome	(CTA) Thin conifers to maintain views of Half Dome
RES-2-087	2	41; Devil's Elbow	Views of Sentinel Rock, Three Brothers, El Capitan and Cathedral Rocks are being affected by conifer growth from a site where Northside Drive touches upon the edge of the river.	Selectively thin conifers to maintain nearby and distant views	Views of Sentinel Rock, Three Brothers, El Capitan and Cathedral Rocks are being affected by conifer growth from a site where Northside Drive touches upon the edge of the river.	(CTA) Selectively thin conifers to maintain nearby and distant views	(CTA) Selectively thin conifers to maintain nearby and distant views	(CTA) Selectively thin conifers to maintain nearby and distant views	(CTA) Selectively thin conifers to maintain nearby and distant views	(CTA) Selectively thin conifers to maintain nearby and distant views
RES-2-088	2	33; El Capitan Meadow, east end 1	Visitors take in views of the opposing monuments El Capitan and Cathedral Rocks, from the edges and center of the meadow.	Address informal trails and trampling, selectively thin conifers to maintain nearby views of El Capitan	Visitors take in views of the opposing monuments El Capitan and Cathedral Rocks, from the edges and center of the meadow.	(CTA) Address informal trails and trampling, selectively thin conifers to maintain nearby views of El Capitan	(CTA) Address informal trails and trampling, selectively thin conifers to maintain nearby views of El Capitan	(CTA) Address informal trails and trampling, selectively thin conifers to maintain nearby views of El Capitan	(CTA) Address informal trails and trampling, selectively thin conifers to maintain nearby views of El Capitan	(CTA) Address informal trails and trampling, selectively thin conifers to maintain nearby views of El Capitan
RES-2-090	2	21; El Capitan Postage Beach 1	From the edge of Northside Drive, historic views of El Capitan are getting blocked by conifers.	Remove invasive blackberry to maintain view of prominent features	From the edge of Northside Drive, historic views of El Capitan are getting blocked by conifers.	(CTA) Remove invasive blackberry to maintain view of prominent features	(CTA) Remove invasive blackberry to maintain view of prominent features	(CTA) Remove invasive blackberry to maintain view of prominent features	(CTA) Remove invasive blackberry to maintain view of prominent features	(CTA) Remove invasive blackberry to maintain view of prominent features
RES-2-091	2	3; El Capitan Postage Stamp Scene	From the edge of Southside Drive, historic views of El Capitan are getting blocked by conifers.	Remove conifers, thin alders to restore view of El Capitan	From the edge of Southside Drive, historic views of El Capitan are getting blocked by conifers.	(CTA) Remove conifers, thin alders to restore view of El Capitan	(CTA) Remove conifers, thin alders to restore view of El Capitan	(CTA) Remove conifers, thin alders to restore view of El Capitan	(CTA) Remove conifers, thin alders to restore view of El Capitan	(CTA) Remove conifers, thin alders to restore view of El Capitan
RES-2-092	2	44; Ferry Bend	Yosemite Falls are seen in the distance, over the river, but the view will be compromised as trees encroach.	Selectively thin conifers to maintain distant views	Yosemite Falls are seen in the distance, over the river, but the view will be compromised as trees encroach.	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views
RES-2-093	2	32; Four Mile Trailhead	From the roadside and trailhead, visitors look toward Yosemite Falls and Sentinel Rock. Tree growth has the potential to change these views over time.	Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	From the roadside and trailhead, visitors look toward Yosemite Falls and Sentinel Rock. Tree growth has the potential to change these views over time.	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls
RES-2-094	2	14; Happy Isles Bridge	At the trailhead of the Mist Trail, an important park attraction, foreground views of Glacier Point apron are limited by conifers.	Selectively thin conifers to maintain view of Glacier Point apron	At the trailhead of the Mist Trail, an important park attraction, foreground views of Glacier Point apron are limited by conifers.	(CTA) Selectively thin conifers to maintain view of Glacier Point apron	(CTA) Selectively thin conifers to maintain view of Glacier Point apron	(CTA) Selectively thin conifers to maintain view of Glacier Point apron	(CTA) Selectively thin conifers to maintain view of Glacier Point apron	(CTA) Selectively thin conifers to maintain view of Glacier Point apron
RES-2-096	2	26; Housekeeping Camp Beach	Conifer growth is encroaching on the riparian corridor, restricting views of Yosemite Falls, Glacier Point.	Thin conifers to maintain distant views	Conifer growth is encroaching on the riparian corridor, restricting views of Yosemite Falls, Glacier Point.	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views
RES-2-097	2	92; Housekeeping Camp bridge	Conifer growth is encroaching on the riparian corridor, restricting views of Yosemite Falls, Glacier Point.	Selectively thin trees to maintain views of Glacier Point and Yosemite Falls	Conifer growth is encroaching on the riparian corridor, restricting views of Yosemite Falls, Glacier Point.	(CTA) Selectively thin trees to maintain views of Glacier Point and Yosemite Falls	(CTA) Selectively thin trees to maintain views of Glacier Point and Yosemite Falls	(CTA) Selectively thin trees to maintain views of Glacier Point and Yosemite Falls	(CTA) Selectively thin trees to maintain views of Glacier Point and Yosemite Falls	(CTA) Selectively thin trees to maintain views of Glacier Point and Yosemite Falls
RES-2-098	2	17; Hutchings View A	Ongoing growth of conifers impinges on views of Half Dome, Yosemite Falls, Sentinel Rock, North Dome, Glacier Point, Royal Arches, Washington Column, which visitors appreciate from roadside and trails.	Selectively thin conifers to maintain distant views	Ongoing growth of conifers impinges on views of Half Dome, Yosemite Falls, Sentinel Rock, North Dome, Glacier Point, Royal Arches, Washington Column, which visitors appreciate from roadside and trails.	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views
RES-2-099	2	158; Hutchings View B	Distant views of Half Dome will gradually be compromised by conifer growth.	Selectively thin conifers to maintain views	Distant views of Half Dome will gradually be compromised by conifer growth.	(CTA) Selectively thin conifers to maintain views	(CTA) Selectively thin conifers to maintain views	(CTA) Selectively thin conifers to maintain views	(CTA) Selectively thin conifers to maintain views	(CTA) Selectively thin conifers to maintain views

Action Code	Segment	Project Name	Issue Statement	Common To All	Alternative 1 ( No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
RES-2-100	2	30; Illilouette View	From a vista point on the John Muir Trail, hikers and backpackers can see Yosemite Falls, Glacier Point, Glacier Point Apron, Illilouette Fall, views that may be compromised by ongoing growth of conifers.	Selectively thin conifers to maintain distant views	From a vista point on the John Muir Trail, hikers and backpackers can see Yosemite Falls, Glacier Point, Glacier Point Apron, Illilouette Fall, views that may be compromised by ongoing growth of conifers.	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views	(CTA) Selectively thin conifers to maintain distant views
RES-2-102	2	31; Leidig Meadow, west end 1	The open meadow provides broad vistas of Half Dome, Yosemite Falls, Sentinel Rock, Three Brothers, North Dome, Cathedral Rocks, Royal Arches, Washington Column, and Clouds Rest, vistas that are threatened by non-native blackberry and encroaching conifers.	Remove manage encroaching conifers to maintain view of prominent features.	The open meadow provides broad vistas of Half Dome, Yosemite Falls, Sentinel Rock, Three Brothers, North Dome, Cathedral Rocks, Royal Arches, Washington Column, and Clouds Rest, vistas that are threatened by non-native blackberry and encroaching conifers.	(CTA) Remove manage encroaching conifers to maintain view of prominent features.	(CTA) Remove manage encroaching conifers to maintain view of prominent features.	(CTA) Remove manage encroaching conifers to maintain view of prominent features.	(CTA) Remove manage encroaching conifers to maintain view of prominent features.	(CTA) Remove manage encroaching conifers to maintain view of prominent features.
RES-2-104	2	48; Lower Falls bridge	Looking down Yosemite Creek, views across the Merced River to Sentinel Rock are compromised by increasing forest density.	Selectively thin conifers to maintain nearby view and view of Sentinel Rock	Looking down Yosemite Creek, views across the Merced River to Sentinel Rock are compromised by increasing forest density.	(CTA) Selectively thin conifers to maintain nearby view and view of Sentinel Rock	(CTA) Selectively thin conifers to maintain nearby view and view of Sentinel Rock	(CTA) Selectively thin conifers to maintain nearby view and view of Sentinel Rock	(CTA) Selectively thin conifers to maintain nearby view and view of Sentinel Rock	(CTA) Selectively thin conifers to maintain nearby view and view of Sentinel Rock
RES-2-115	2	22; Sentinel Beach	The existing picnic area offers upstream views of Yosemite Falls, North Dome, Clouds Rest, while some larger-scale riparian vegetation (alders and cottonwood) is encroaching.	Selectively thin deciduous trees to open distant views upriver	The existing picnic area offers upstream views of Yosemite Falls, North Dome, Clouds Rest, while some larger-scale riparian vegetation (alders and cottonwood) is encroaching.	(CTA) Selectively thin deciduous trees to open distant views upriver	(CTA) Selectively thin deciduous trees to open distant views upriver	(CTA) Selectively thin deciduous trees to open distant views upriver	(CTA) Selectively thin deciduous trees to open distant views upriver	(CTA) Selectively thin deciduous trees to open distant views upriver
RES-2-116	2	28; Sentinel Bridge	Views are provided across the Merced River toward Half Dome. Tree growth has the potential to change these views over time.	Maintain view of Half Dome by thinning conifers and burning undergrowth	Views are provided across the Merced River toward Half Dome. Tree growth has the potential to change these views over time.	(CTA) Maintain view of Half Dome by thinning conifers and burning undergrowth	(CTA) Maintain view of Half Dome by thinning conifers and burning undergrowth	(CTA) Maintain view of Half Dome by thinning conifers and burning undergrowth	(CTA) Maintain view of Half Dome by thinning conifers and burning undergrowth	(CTA) Maintain view of Half Dome by thinning conifers and burning undergrowth
RES-2-117	2	12; Sentinel Bridge parking area	Views across Cooks Meadow, toward Yosemite Falls, will become obscured or eliminated by encroaching conifers.	Remove encroaching conifers to open view of Yosemite Falls	Views across Cooks Meadow, toward Yosemite Falls, will become obscured or eliminated by encroaching conifers.	(CTA) Remove encroaching conifers to open view of Yosemite Falls	(CTA) Remove encroaching conifers to open view of Yosemite Falls	(CTA) Remove encroaching conifers to open view of Yosemite Falls	(CTA) Remove encroaching conifers to open view of Yosemite Falls	(CTA) Remove encroaching conifers to open view of Yosemite Falls
RES-2-118	2	24; Sentinel Meadow boardwalk	The boardwalk provides open vistas of Half Dome, Yosemite Falls, Sentinel Rock, North Dome, Royal Arches, Cathedral Rocks, Washington Column. These vistas can be limited by encroaching tree growth.	Monitor conditions and maintain distant views	The boardwalk provides open vistas of Half Dome, Yosemite Falls, Sentinel Rock, North Dome, Royal Arches, Cathedral Rocks, Washington Column. These vistas can be limited by encroaching tree growth.	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views
RES-2-119	2	156; Southside Drive at Roosevelt turnout	Roadside views of El Capitan and Ribbon Fall are increasingly limited by increasing conifer forest density and encroachment on Bridalveil Meadow.	Monitor conditions and maintain nearby views	Roadside views of El Capitan and Ribbon Fall are increasingly limited by increasing conifer forest density and encroachment on Bridalveil Meadow.	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views
RES-2-120	2	152; Southside Drive, Bridalveil approach via Roosevelt turnout	Roadside views of El Capitan, Cathedral Rocks and Ribbon Fall are limited by conifer growth.	Monitor conditions and maintain nearby views	Roadside views of El Capitan, Cathedral Rocks and Ribbon Fall are limited by conifer growth.	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views	(CTA) Monitor conditions and maintain nearby views
RES-2-121	2	225; Southside Drive, Cathedral Spires turnout	View from Southside Drive may become limited by conifer growth at the roadside attraction site.	Monitor conditions and maintain distant views	View from Southside Drive may become limited by conifer growth at the roadside attraction site.	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views
RES-2-122	2	25; Stoneman Bridge	Pedestrians and cyclists look north along the Merced River to views of Half Dome and east to North Dome and Glacier Point. The increasing density of tree growth has the potential to change these views over time.	Thin conifers to maintain distant views	Pedestrians and cyclists look north along the Merced River to views of Half Dome and east to North Dome and Glacier Point. The increasing density of tree growth has the potential to change these views over time.	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views	(CTA) Thin conifers to maintain distant views

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RES-2-123	2	6; Stoneman Meadow boardwalk	Visitors enjoy long views of Half Dome, North Dome, Glacier Point, Eagle Peak, Staircase Falls across the open meadow.	Remove conifers to maintain distant views	Visitors enjoy long views of Half Dome, North Dome, Glacier Point, Eagle Peak, Staircase Falls across the open meadow.	(CTA) Remove conifers to maintain distant views	(CTA) Remove conifers to maintain distant views	(CTA) Remove conifers to maintain distant views	(CTA) Remove conifers to maintain distant views	(CTA) Remove conifers to maintain distant views
RES-2-125	2	47; Superintendent's Bridge	Pedestrians can view Sentinel Rock and North Dome in the distance. Forest growth will impinge upon these views.	Monitor conditions and maintain distant views	Pedestrians can view Sentinel Rock and North Dome in the distance. Forest growth will impinge upon these views.	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views
RES-2-126	2	23; Swinging Bridge: Scenic	Pedestrians and cyclists see Yosemite Falls, Sentinel Rock, North Dome. Conifers must be managed to keep the views clear into the future.	Selectively thin encroaching conifers to open distant views	Pedestrians and cyclists see Yosemite Falls, Sentinel Rock, North Dome. Conifers must be managed to keep the views clear into the future.	(CTA) Selectively thin encroaching conifers to open distant views	(CTA) Selectively thin encroaching conifers to open distant views	(CTA) Selectively thin encroaching conifers to open distant views	(CTA) Selectively thin encroaching conifers to open distant views	(CTA) Selectively thin encroaching conifers to open distant views
RES-2-127	2	49; Tunnel View	This highly active attraction site offers long-distance views over the river corridor to Half Dome, Bridalveil Fall, Sentinel Rock, El Capitan and Cathedral Rocks. From time to time, conifers must be removed to preserve views that were established with tunnel construction.	Monitor conditions and maintain distant views	This highly active attraction site offers long-distance views over the river corridor to Half Dome, Bridalveil Fall, Sentinel Rock, El Capitan and Cathedral Rocks. From time to time, conifers must be removed to preserve views that were established with tunnel construction.	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views	(CTA) Monitor conditions and maintain distant views
RES-2-128	2	146; Valley View	Visitors enjoy a dramatic view of El Capitan, Bridalveil Fall, Cathedral Rocks, Leaning Tower from a roadside turnout on Northside Drive at the river's edge. Conifers are encroaching upon meadows across the river.	Selectively thin encroaching conifers to maintain distant views	Visitors enjoy a dramatic view of El Capitan, Bridalveil Fall, Cathedral Rocks, Leaning Tower from a roadside turnout on Northside Drive at the river's edge. Conifers are encroaching upon meadows across the river.	(CTA) Selectively thin encroaching conifers to maintain distant views	(CTA) Selectively thin encroaching conifers to maintain distant views	(CTA) Selectively thin encroaching conifers to maintain distant views	(CTA) Selectively thin encroaching conifers to maintain distant views	(CTA) Selectively thin encroaching conifers to maintain distant views
RES-2-130	2	29; Vernal Fall footbridge	Conifers are encroaching on the riverbanks to limit the view upriver to Vernal Fall.	Selectively thin conifers to maintain view of Vernal Fall	Conifers are encroaching on the riverbanks to limit the view upriver to Vernal Fall.	(CTA) Selectively thin conifers to maintain view of Vernal Fall	(CTA) Selectively thin conifers to maintain view of Vernal Fall	(CTA) Selectively thin conifers to maintain view of Vernal Fall	(CTA) Selectively thin conifers to maintain view of Vernal Fall	(CTA) Selectively thin conifers to maintain view of Vernal Fall
RES-2-131	2	39; Visitor center benches	Park visitors can see Glacier Point and Yosemite Falls from the visitor center, an attraction site that is gradually being surrounded by conifers.	Thin encroaching conifers to maintain views of Glacier Point and Yosemite Falls	Park visitors can see Glacier Point and Yosemite Falls from the visitor center, an attraction site that is gradually being surrounded by conifers.	(CTA) Thin encroaching conifers to maintain views of Glacier Point and Yosemite Falls	(CTA) Thin encroaching conifers to maintain views of Glacier Point and Yosemite Falls	(CTA) Thin encroaching conifers to maintain views of Glacier Point and Yosemite Falls	(CTA) Thin encroaching conifers to maintain views of Glacier Point and Yosemite Falls	(CTA) Thin encroaching conifers to maintain views of Glacier Point and Yosemite Falls
RES-2-139	2	42; Wosky Pond	From the roadside and trail, visitors see El Capitan and Cathedral Rocks across open space in the forest.	Manage encroaching conifers	From the roadside and trail, visitors see El Capitan and Cathedral Rocks across open space in the forest.	(CTA) Manage encroaching conifers	(CTA) Manage encroaching conifers	(CTA) Manage encroaching conifers	(CTA) Manage encroaching conifers	(CTA) Manage encroaching conifers
RES-2-141	2	18; Yosemite Falls View	Conifers are encroaching on views of Yosemite Falls from the Yosemite Falls trail.	Selectively thin conifers to maintain view of Yosemite Falls	Conifers are encroaching on views of Yosemite Falls from the Yosemite Falls trail.	(CTA) Selectively thin conifers to maintain view of Yosemite Falls	(CTA) Selectively thin conifers to maintain view of Yosemite Falls	(CTA) Selectively thin conifers to maintain view of Yosemite Falls	(CTA) Selectively thin conifers to maintain view of Yosemite Falls	(CTA) Selectively thin conifers to maintain view of Yosemite Falls
RES-2-142	2	19; Yosemite Lodge Portico	Conifers are affecting views of Yosemite Lodge Sentinel Rock, Yosemite Falls from the primary entrance and bus unloading area at Yosemite Lodge.	Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	Conifers are affecting views of Yosemite Lodge Sentinel Rock, Yosemite Falls from the primary entrance and bus unloading area at Yosemite Lodge.	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls	(CTA) Selectively thin conifers to maintain views of Sentinel Rock and Yosemite Falls
RES-2-143	2	Concessioner Stables to Happy Isles: Pack stock trail	The pack stock trail, north of the river, between Clark's Bridge and the Concessioner Stables, is within the ordinary high-water mark. It is continually washed out, which precludes the growth of riparian vegetation, posing a water quality concern due to erosion and sediment washing into the river.	Remove 3,800' of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material with an excavator and skid steer, decompact hardened surfaces, recontour surfaces and plant riparian vegetation where needed (Fig. O).	The pack stock trail, north of the river, between Clark's Bridge and the Concessioner Stables, is within the ordinary high-water mark; the area is subject to seasonal flooding, accelerated erosion, and sediment deposition in the river.	(CTA) Remove 3,800 feet of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material with an excavator and skid steer, decompact hardened surfaces, recontour surfaces and plant riparian vegetation where needed.  (The stables are removed in this alternative.)	(CTA) Remove 3,800 feet of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material with an excavator and skid steer, decompact hardened surfaces, recontour surfaces and plant riparian vegetation where needed.  Also, in addition to common to all, re-route stock use north along the road where they meet up on the Valley Loop Trail.	(CTA) Remove 3,800 feet of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material with an excavator and skid steer, decompact hardened surfaces, recontour surfaces and plant riparian vegetation where needed.  (The stables are removed and converted to camping in this alternative)	(CTA) Remove 3,800 feet of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material with an excavator and skid steer, decompact hardened surfaces, recontour surfaces and plant riparian vegetation where needed.  Also, in addition to common to all, re-route stock use north along the road where they meet up on the Valley Loop Trail.	(CTA) Remove 3,800 feet of pack stock trail proximate to the riverbank. Remove residual asphalt and other fill material with an excavator and skid steer, decompact hardened surfaces, recontour surfaces and plant riparian vegetation where needed.  Also, in addition to common to all, re-route stock use north along the road where they meet up on the Valley Loop Trail.

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RES-2-144	2	Upper Pines: dump station	The Upper Pines dump station is situated very close to the river, leading to some risk of river contamination.	Relocate the dump station to between Curry and the campgrounds entrance, as planned with relocation of the utilities.	The Upper Pines dump station is situated very close to the river.	(CTA) Relocate the dump station to between Curry and the campgrounds entrance, as planned with relocation of the utilities.	(CTA) Relocate the dump station to between Curry and the campgrounds entrance, as planned with relocation of the utilities.	(CTA) Relocate the dump station to between Curry and the campgrounds entrance, as planned with relocation of the utilities.	(CTA) Relocate the dump station to between Curry and the campgrounds entrance, as planned with relocation of the utilities.	(CTA) Relocate the dump station to between Curry and the campgrounds entrance, as planned with relocation of the utilities.
RES-2-145	2	Cathedral Beach Picnic Area: Effects on Riparian Zone and Visitor Experience	The Cathedral Beach picnic area is negatively affected by high visitor use, exceeding the design of the existing infrastructure. The resulting loss of riparian vegetation contributes to riverbank erosion.	Designate area as a formal river access point, fence off sensitive areas, direct use to more resilient areas, and reestablish impacted native riparian vegetation. Remove parking in the riparian zone, decompact soils, plant appropriate vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain, decompact soils, plant appropriate vegetation and delineate river access.	Visitor use at the Cathedral Beach picnic area exceeds the design of the existing infrastructure. There is no formal river access and the parking is not delineated. Picnic benches are easily moved throughout the area. The resulting loss of riparian vegetation contributes to riverbank erosion.	(CTA) Designate area as a formal river access point, fence off sensitive areas, direct use to more resilient areas, and reestablish impacted native riparian vegetation. Remove parking in the riparian zone, decompact soils, plant appropriate vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain, decompact soils, plant appropriate vegetation and delineate river access.	(CTA) Designate area as a formal river access point, fence off sensitive areas, direct use to more resilient areas, and reestablish impacted native riparian vegetation. Remove parking in the riparian zone, decompact soils, plant appropriate vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain, decompact soils, plant appropriate vegetation and delineate river access.	(CTA) Designate area as a formal river access point, fence off sensitive areas, direct use to more resilient areas, and reestablish impacted native riparian vegetation. Remove parking in the riparian zone, decompact soils, plant appropriate vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain, decompact soils, plant appropriate vegetation and delineate river access.	(CTA) Designate area as a formal river access point, fence off sensitive areas, direct use to more resilient areas, and reestablish impacted native riparian vegetation. Remove parking in the riparian zone, decompact soils, plant appropriate vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain, decompact soils, plant appropriate vegetation and delineate river access.	(CTA) Designate area as a formal river access point, fence off sensitive areas, direct use to more resilient areas, and reestablish impacted native riparian vegetation. Remove parking in the riparian zone, decompact soils, plant appropriate vegetation and delineate river access. Remove infrastructure (toilets, parking and picnic tables) in the 10-year floodplain, decompact soils, plant appropriate vegetation and delineate river access.
RES-2-146	2	Yosemite Village Day-use Parking Area: Restoration	This unimproved parking area has no mitigations for water quality. It is in the 5-10-yr floodplain, was formerly a meadow, and is in the potential channel migration zone. Some areas of the Yosemite Village Day-use Parking Area are constructed with fill, decreasing the extent of overbank flooding.		This unimproved parking area has no mitigations for water quality. It is in the 5-10-year floodplain, was formerly a meadow, and is in the potential channel migration zone. Some areas of Yosemite Village Day-use Parking Area are constructed with fill.	Move unimproved parking area north closer to the Village Center and reroute Northside Drive to just above the 10-year floodplain. Remove fill material and restore meadow and floodplain ecosystems.	Move unimproved parking area north closer to the Village Center and reroute Northside Drive to just above the 10-year floodplain. Remove fill material and restore meadow and floodplain ecosystems.	Move the unimproved parking lot northward approximately 150 feet away from the ordinary high-water mark and wetland areas and restore the riparian habitat adjacent to the river.	Move the unimproved parking lot northward approximately 150 feet away from the ordinary high-water mark and wetland areas and restore the riparian habitat adjacent to the river.	Move the unimproved parking lot northward approximately 150 feet away from the ordinary high-water mark and wetland areas and restore the riparian habitat adjacent to the river.
RES-2-149	2	Yosemite Lodge: Beach Access	Visitors at Yosemite Lodge do not have good beach access near the lodge.	Direct visitors to the sandbar at Swinging Bridge. Fence riparian area at Yosemite Lodge.	Visitors at Yosemite Lodge do not have good beach access near the lodge.	(CTA) Direct visitors to the sandbar at Swinging Bridge. Fence riparian area at Yosemite Lodge.	(CTA) Direct visitors to the sandbar at Swinging Bridge. Fence riparian area at Yosemite Lodge.	(CTA) Direct visitors to the sandbar at Swinging Bridge. Fence riparian area at Yosemite Lodge.	(CTA) Direct visitors to the sandbar at Swinging Bridge. Fence riparian area at Yosemite Lodge.	(CTA) Direct visitors to the sandbar at Swinging Bridge. Fence riparian area at Yosemite Lodge.
RES-2-150	2	Residence 1: poor condition, recurring flooding and informal trails	Residence 1, also known as the Superintendent's House, is subject to recurring flooding and subsequent water damage. The historic interior finishes of the historic residence, especially the distinctive plaster work, are in poor condition. Also, structural issues related to settling of the foundation have resulted in displacement of walls and floors. Visitor use in this area has caused radiating informal trails that impact Cook's Meadow.		Residence 1, also known as the Superintendent's House, is subject to recurring flooding and subsequent water damage. The historic interior finishes of the Superintendent's House, especially the distinctive plaster work, are in poor condition. Also, structural issues related to settling of the foundation have resulted in displacement of walls and floors. Visitor use in this area has caused radiating informal trails that impact Cook's Meadow.	Relocate Residence 1 (the Superintendent's House) to the NPS housing area and, at a minimum, rehabilitate the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (2012). Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.	Relocate Residence 1 (the Superintendent's House) to the NPS housing area and, at a minimum, rehabilitate the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (2012). Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.	Relocate Residence 1 (the Superintendent's House) to the NPS housing area and, at a minimum, rehabilitate the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (2012). Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.	Relocate Residence 1 (the Superintendent's House) to the NPS housing area and, at a minimum, rehabilitate the building per the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (2012). Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.	Rehabilitate Residence 1 (Superintendent's House) per Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995) and the Historic Structure Report (2012) in its existing location to preserve the historic fabric while preparing the structure to withstand periodic flooding. Ecologically restore associated informal trails in Cook's Meadow and address continuing use patterns to enhance black oak woodland and meadow habitat.
RES-2-151	2	Ahwahnee Meadow: former golf course and tennis court	The Ahwahnee Meadow contains several modifications to topography that impact meadow quality and hydrologic function. These include ditching; fill material still found in the former golf course, former roadbed and the SW corner of the meadow; large conifers that have become established along the former roadbed. Additionally, the tennis court is in a black oak community.	Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions, while allowing special functions, such as weddings to continue on the lawn. Remove the tennis courts from the black oak woodland. Restore topography by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow vegetation. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers to return approximately 5.7 acres to meadow habitat.	The Ahwahnee Meadow contains several modifications to topography. These include ditching; fill material still found in the former golf course, former roadbed and the SW corner of the meadow; large conifers that have become established along the former roadbed. Additionally, the tennis court is in a black oak community.	(CTA) Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions, while allowing special functions, such as weddings to continue on the lawn. Remove the tennis courts from the black oak woodland. Restore topography by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow vegetation. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers to return approximately 5.7 acres to meadow habitat.	(CTA) Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions, while allowing special functions, such as weddings to continue on the lawn. Remove the tennis courts from the black oak woodland. Restore topography by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow vegetation. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers to return approximately 5.7 acres to meadow habitat.	(CTA) Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions, while allowing special functions, such as weddings to continue on the lawn. Remove the tennis courts from the black oak woodland. Restore topography by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow vegetation. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers to return approximately 5.7 acres to meadow habitat.	(CTA) Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions, while allowing special functions, such as weddings to continue on the lawn. Remove the tennis courts from the black oak woodland. Restore topography by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow vegetation. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers to return approximately 5.7 acres to meadow habitat.	(CTA) Restore the impacted portion of Ahwahnee Meadow to natural meadow conditions, while allowing special functions, such as weddings to continue on the lawn. Remove the tennis courts from the black oak woodland. Restore topography by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow vegetation. Reconnect currently disjunct portions of Ahwahnee Meadow by removing conifers to return approximately 5.7 acres to meadow habitat.

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RES-2-152	2	CA-MRP-0902/H	Informal trails contribute to archeological site disturbances at CA-MRP-0902/H.	Remove informal trails that contribute to archeological site disturbance.	Informal trails contribute to archeological site disturbances at CA-MRP-0902/H.	(CTA) Remove informal trails that contribute to archeological site disturbance.	(CTA) Remove informal trails that contribute to archeological site disturbance.	(CTA) Remove informal trails that contribute to archeological site disturbance.	(CTA) Remove informal trails that contribute to archeological site disturbance.	(CTA) Remove informal trails that contribute to archeological site disturbance.
RES-2-153	2	Stoneman Meadow protection and enhancement	Stoneman Meadow contains a ditch that may lower the water table. Invasive plants and conifers have become established in the meadow. Wetlands surrounding Stoneman Meadow are vulnerable to trampling. Current fencing could be better situated to protect these wetlands.	Slightly expand fenced area to protect wetlands on north end of meadow near Lower Pines Campground. Remove invasive non-native species and encroaching conifers. Remove ditch, fill with native soils and revegetate.	Ditching remains in the Stoneman Meadow. Wetlands not protected by fencing are vulnerable to trampling.	(CTA) Slightly expand fenced area to protect wetlands on north end of meadow near Lower Pines Campground. Remove invasive non-native species and encroaching conifers. Remove ditch, fill with native soils and revegetate.	(CTA) Slightly expand fenced area to protect wetlands on north end of meadow near Lower Pines Campground. Remove invasive non-native species and encroaching conifers. Remove ditch, fill with native soils and revegetate.	(CTA) Slightly expand fenced area to protect wetlands on north end of meadow near Lower Pines Campground. Remove invasive non-native species and encroaching conifers. Remove ditch, fill with native soils and revegetate.	(CTA) Slightly expand fenced area to protect wetlands on north end of meadow near Lower Pines Campground. Remove invasive non-native species and encroaching conifers. Remove ditch, fill with native soils and revegetate.	(CTA) Slightly expand fenced area to protect wetlands on north end of meadow near Lower Pines Campground. Remove invasive non-native species and encroaching conifers. Remove ditch, fill with native soils and revegetate.
RES-2-154	2	Former Pine and Oak	Removal of the former Yosemite Lodge units and cabins after the 1997 flood has left the area with fill and impacts from soil compaction. A network of roads remains that once facilitated access to these lodging units.		There is no development in the site of the former Pine and Oak cabins at Yosemite Lodge. Removal of the former Yosemite Lodge units and cabins after the 1997 flood has left the area with fill and impacts from soil compaction. A network of roads remains that once facilitated access to these lodging units.	Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate one service road to the well house and parking. Remove fill, decompact soils and plant riparian plant species.	Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate one service road to the well house and parking. Remove fill, decompact soils and plant riparian plant species.	Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate one service road to the well house and parking. Remove fill, decompact soils and plant riparian plant species.	Restore 10.9 acres of riparian ecosystem at the site of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Delineate one service road to the well house and parking. Remove fill, decompact soils and plant riparian plant species.	Construct parking on the disturbed footprint of the former Yosemite Lodge units and cabins (those that were damaged by the 1997 flood and subsequently removed). Retain one service road to the well house.
RES-2-155	2	Valley Swinging Bridge river access	Current fencing along the bike path leads people to access the river upstream, river right of Swinging Bridge and has lead to vegetation trampling and erosion.	Move fencing to connect to bridge and restore denuded area. Direct use to a large sandbar directly downstream of bridge.	Current fencing along the bike path leads people to access the river upstream, river right of Swinging Bridge and has lead to vegetation trampling and erosion.	(CTA) Move fencing to connect to bridge and restore denuded area. Direct use to a large sandbar directly downstream of bridge.	(CTA) Move fencing to connect to bridge and restore denuded area. Direct use to a large sandbar directly downstream of bridge.	(CTA) Move fencing to connect to bridge and restore denuded area. Direct use to a large sandbar directly downstream of bridge.	(CTA) Move fencing to connect to bridge and restore denuded area. Direct use to a large sandbar directly downstream of bridge.	(CTA) Move fencing to connect to bridge and restore denuded area. Direct use to a large sandbar directly downstream of bridge.
RES-2-156	2	Conifer encroachment in meadows	Conifers have been encroaching on Yosemite Valley meadows due to changes in ecological processes including alteration of fire regime, alteration of hydrology and changes in climate.	Manually or mechanically remove conifer seedlings and saplings from meadows and black oak communities in Yosemite Valley. Restore low-intensity, high frequency fire as an ecological process. Restore hydrologic processes where possible.	Conifers have been encroaching on Yosemite Valley meadows due to changes in ecological processes including alteration of fire regime, alteration of hydrology and changes in climate.	(CTA) Manually or mechanically remove conifer seedlings and saplings from meadows and black oak communities in Yosemite Valley. Restore low-intensity, high frequency fire as an ecological process. Restore hydrologic processes where possible.	(CTA) Manually or mechanically remove conifer seedlings and saplings from meadows and black oak communities in Yosemite Valley. Restore low-intensity, high frequency fire as an ecological process. Restore hydrologic processes where possible.	(CTA) Manually or mechanically remove conifer seedlings and saplings from meadows and black oak communities in Yosemite Valley. Restore low-intensity, high frequency fire as an ecological process. Restore hydrologic processes where possible.	(CTA) Manually or mechanically remove conifer seedlings and saplings from meadows and black oak communities in Yosemite Valley. Restore low-intensity, high frequency fire as an ecological process. Restore hydrologic processes where possible.	(CTA) Manually or mechanically remove conifer seedlings and saplings from meadows and black oak communities in Yosemite Valley. Restore low-intensity, high frequency fire as an ecological process. Restore hydrologic processes where possible.
RES-2-157	2	16; Ahwahnee Hotel front lawn	Views of Royal Arches and Half Dome are obscured by increasing conifer forest growth and encroachment on open spaces surrounding the hotel.	Selectively thin conifers to open view.	Conifer encroachment growth is limiting views of Royal Arches and Half Dome.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.
RES-2-158	2	226; Cathedral Beach Parking	Views from the picnic the river and nearby granite monoliths are hampered by conifer forest growth and encroachment on the river.	Selectively thin conifers to open view.	Conifer growth is affecting views of the river and granite monoliths, from the picnic area.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.	(CTA) Selectively thin conifers to open view.
RES-2-159	2	LeConte Memorial Lodge	LeConte Memorial Lodge NHL is currently in "fair" condition	Develop a Historic Structure Report and address recommendations for treatment to bring the NHL to "good" condition.	LeConte Memorial Lodge NHL is currently in "fair" condition	(CTA) Develop a Historic Structure Report and address recommendations for treatment to bring the NHL to "good" condition.	(CTA) Develop a Historic Structure Report and address recommendations for treatment to bring the NHL to "good" condition.	(CTA) Develop a Historic Structure Report and address recommendations for treatment to bring the NHL to "good" condition.	(CTA) Develop a Historic Structure Report and address recommendations for treatment to bring the NHL to "good" condition.	(CTA) Develop a Historic Structure Report and address recommendations for treatment to bring the NHL to "good" condition.
RES-2-160	2	Superintendent's Bridge, which is a footbridge, and associated revetments	Superintendent's Bridge, which is a footbridge, affects the free-flowing condition of the Merced Wild and Scenic River	Install constructed log jams, and utilize bioconstructed stabilization on riprap to improve hydrologic function.	Superintendent's Bridge, which is a footbridge, constricts hydrologic flow of the Merced River.	(CTA) Install constructed log jams, and utilize bioconstructed stabilization on riprap to improve hydrologic function.	(CTA) Install constructed log jams, and utilize bioconstructed stabilization on riprap to improve hydrologic function.	(CTA) Install constructed log jams, and utilize bioconstructed stabilization on riprap to improve hydrologic function.	(CTA) Install constructed log jams, and utilize bioconstructed stabilization on riprap to improve hydrologic function.	(CTA) Install constructed log jams, and utilize bioconstructed stabilization on riprap to improve hydrologic function.

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RES-2-161	2	Yosemite Valley Traditional Cultural Property Nomination	The ethnographic resources in Yosemite Valley have not been documented, mapped, or evaluated to provide the detail necessary for legally-required protection and enhancement of the resources, and for accurate and timely information for interpretive programs.	Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.	The ethnographic resources in Yosemite Valley have not been documented, mapped, or evaluated to provide the detail necessary for legally-required protection and enhancement of the resources, and for accurate and timely information for interpretive programs.	(CTA) Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.	(CTA) Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.	(CTA) Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.	(CTA) Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.	(CTA) Document the Yosemite Valley Traditional Cultural Property, consisting of traditional use areas, spiritual places and historic villages and complete National Register evaluation and interpretive summary.
TRAN-2-001	2	Yosemite Village Day-use Parking Area: Vehicle vs. pedestrian conflicts and intersection performance at Northside Drive and Village Drive	Throughout the peak summer season, significant delays in outbound traffic flow are experienced at the intersection of Northside Drive and Village Drive due to vehicle-pedestrian conflicts and poor intersection performance.		Throughout the peak summer season, significant delays in outbound traffic flow are experienced at Yosemite Village Day-use Parking Area intersection. This is an offset four-way intersection connecting the exit to Yosemite Village Day-use Area, Northside Drive, and Village Drive. A bike path, shuttle stop, and pedestrian crossings through this intersection create conflicts between vehicular and pedestrian traffic. The intersection's offset design also creates confusion for motorists diminishing the intersection performance significantly. The intersection is not currently designed to traffic engineering standards for such intersections.	Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area. Consolidate parking to the north of the road and out of the dynamic 10-year floodplain. Provide walkways leading to Yosemite Village separating vehicle and pedestrian traffic and eliminating conflicts. Re-designed traffic circulation patterns would not require roundabouts or pedestrian road crossings.	Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area. Consolidate parking to the north of the road and provide walkways leading to Yosemite Village separating vehicle and pedestrian traffic and eliminating conflicts. Re-designed traffic circulation patterns would not require roundabouts or pedestrian road crossings.	Re-align the intersection at Northside Drive and Village Drive to meet standards for a proper four-way intersection and improve performance. Add a three-way intersection at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion. Provide on-grade pedestrian crossings with proper sight lines to improve vehicle-pedestrian conflicts.	Re-route Northside Drive to the south of the Yosemite Village Day-use Parking Area and construct a traffic circle at Northside Drive/Village Drive to address traffic congestion and pedestrian/vehicle conflicts. Consolidate parking to the north of the road and provide walkways leading to Yosemite Village separating vehicle and pedestrian traffic . Add a three-way intersection at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion.	Construct a pedestrian underpass and a roundabout at the Northside Drive/ Village Drive to address traffic congestion and pedestrian/vehicle conflicts. Add a three-way intersection at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion. To accommodate this level of in-bound traffic, another roundabout would be constructed at the Sentinel Drive/Northside Drive intersection (Bank 3-Way).
TRAN-2-002	2	Yosemite Village: Intersection Congestion at Northside Drive and Sentinel Drive (the Bank 3-Way)	Throughout the peak summer season, significant delays in outbound traffic flow are experienced at Bank 3-Way Intersection and Northside Dr.		Throughout the peak summer season, significant delays in outbound traffic flow are experienced at the intersection of Northside Drive and Sentinel Drive (Bank 3-Way).	No roundabout needed at the Bank 3-way.	No roundabout needed at the intersection of Northside Drive and Sentinel Drive (Bank 3-Way).	No roundabout needed at the intersection of Northside Drive and Sentinel Drive (Bank 3-Way).	No roundabout needed at the intersection of Northside Drive and Sentinel Drive (Bank 3-Way).	A roundabout would be installed at the intersection of Northside Drive and Sentinel Drive (Bank 3-Way). To accommodate this level of in-bound traffic, another roundabout would be constructed at Northside Drive/Village Drive.
TRAN-2-005	2	Yosemite Lodge: intersection congestion	Throughout the peak summer season, significant delays in outbound traffic flow are experienced at the pedestrian crossing from Yosemite Lodge to Lower Yosemite Falls.		Both day users and Yosemite Lodge overnight guests cross at this intersection to get to and from the Falls.	Move on-grade pedestrian crossing west of the intersection of Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.	Move on-grade pedestrian crossing west of the intersection of Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.	Design a pedestrian underpass to alleviate pedestrian/vehicle conflicts.	Design a pedestrian underpass to alleviate pedestrian/vehicle conflicts.	Design a pedestrian underpass to alleviate pedestrian/vehicle conflicts.
TRAN-2-007	2	Curry Orchard parking area	Demand for parking exceeds supply. There is a need to provide the appropriate level of parking that is protective of river values.		The Curry Orchard Parking area currently has 424 parking spaces.	The Curry Orchard Parking area would be formalized to have 420 parking spaces.	Partial restoration of the Curry Orchard Parking area to facilitate Stoneman Meadow restoration; removes 50 spaces for re-alignment to allow for a total of 300 parking spaces.	Partial restoration of the Curry Orchard Parking area to facilitate Stoneman Meadow restoration; removes 50 spaces for re-alignment to allow for a total of 300 parking spaces.	The Curry Orchard Parking area would be formalized to have 430 parking spaces.	The Curry Orchard Parking area would be formalized to have 430 parking spaces.
TRAN-2-008	2	West of Yosemite Lodge: Yosemite Lodge Parking Area	Demand for day use parking exceeds supply. There is also need to provide the appropriate level of day-use parking that is protective of river values.		The west portion of the Yosemite Lodge is a previously disturbed area that has become overflow parking for tour buses and transit buses, day use and overnight use. The area was formerly employee housing prior to the 1997 flood.	Yosemite Lodge Parking Area re-developed to provide additional 150 day-use parking spaces. This parking area will also accommodate 15 tour buses.	Yosemite Lodge Day-use Parking Area re-developed to provide additional 150 day-use parking spaces. This parking area will also accommodate 15 tour buses.	Yosemite Lodge Day-use Parking Area re-developed to provide additional 150 day-use parking spaces. This parking area will also accommodate 15 tour buses.	Yosemite Lodge Day-use Parking Area re-developed to provide additional 300 day-use parking spaces. This parking area will also accommodate 15 tour buses.	Yosemite Lodge Day-use Parking Area re-developed to provide additional 300 day-use parking spaces. This parking area will also accommodate 15 tour buses.
TRAN-2-009	2	West Valley Overflow Parking Area	Demand for day-use parking exceeds supply. There is also need to provide the appropriate level of day-use parking that is protective of river values.		The West Valley Overflow Parking Area would be located just west of Cathedral Picnic area. This area is flat and has limited resource constraints.	No new parking developed.	No new parking developed.	No new parking developed.	West Valley Overflow Parking Area developed to provide 100 overflow parking spaces south of Southside Drive; Yosemite Valley shuttle service expanded to West Valley.	West Valley Overflow Parking Area developed to provide 250 overflow parking spaces south of Southside Drive; Yosemite Valley shuttle service expanded to West Valley.

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TRAN-2-010	2	Yosemite Lodge: Day-use Lodge Parking	Public comments suggest that the NPS should convert overnight accommodations in Yosemite Valley to day use parking.		Yosemite Lodge area would continue to be used for overnight lodging, parking and food service.	Re-design lodging area at Yosemite Lodge to include 250 parking spaces.	Lodging area not re-designed as day use lodge and parking.	Lodging area not re-designed as day use lodge and parking.	Lodging area not re-designed as day use lodge and parking.	Lodging area not re-designed as day use lodge and parking.
TRAN-2-011	2	Yosemite Lodge: Day-use parking demand	Demand for day-use parking exceeds supply during summer peak use periods. There is also need to provide the appropriate level of day-use parking that is protective of river values.		Demand for day-use parking exceeds supply during summer peak-use periods.	No redesign of parking.	No redesign of parking.	25 additional spaces at Yosemite Lodge due to redesign, improving parking efficiency near Northside Drive.	25 additional spaces at Yosemite Lodge due to redesign, improving parking efficiency near Northside Drive.	25 additional spaces at Yosemite Lodge due to redesign, improving parking efficiency near Northside Drive.
TRAN-2-013	2	Sentinel Drive informal shoulder parking west of road	Informal shoulder parking overflow from Yosemite Village Day-use Parking Area (Camp 6) is encroaching on sensitive habitat in this location.	Remove roadside parking along Sentinel Dr. and restore to natural conditions.	Informal shoulder parking overflow from Yosemite Village Day-use Parking Area (Camp 6) day use parking area is encroaching on sensitive habitat in this location.	(CTA) Remove roadside parking along Sentinel Drive and restore to natural conditions.	(CTA) Remove roadside parking along Sentinel Drive and restore to natural conditions.	(CTA) Remove roadside parking along Sentinel Drive and restore to natural conditions.	(CTA) Remove roadside parking along Sentinel Drive and restore to natural conditions.	(CTA) Remove roadside parking along Sentinel Drive and restore to natural conditions.
TRAN-2-014	2	The Ahwahnee: Parking	Parking and traffic circulation at The Ahwahnee is inadequate to meet overnight and day-use demand.	Re-design and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking. Follow Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration.	Parking and traffic circulation at the Ahwahnee is inadequate to meet overnight and day-use demand.	(CTA) Re-design and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking. Follow Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration	(CTA) Re-design and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking. Follow Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration	(CTA) Re-design and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking. Follow Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration	(CTA) Re-design and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking. Follow Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration	(CTA) Re-design and formalize the existing parking lot; providing for proper drainage. Construct new 50 parking space lot east of the current parking. Follow Ahwahnee Historic Structures Report (1997) and Ahwahnee Cultural Landscape Report (2010) recommendations for parking lot configuration and gate house restoration
TRAN-2-015	2	Curry Village wilderness parking area	Wilderness-related parking area is a former dump site that was not designed as a formal parking area. It is not delineated and undersized for demand.	Remediate the soils at the Wilderness Parking lot, which was once a landfill for Curry Village and formalize parking.	Wilderness parking area was not designed as a formal parking area. It is undersized for demand and not delineated. It was used in the past as the Curry Village dump site.	(CTA) Remediate the Curry Village dump at the Wilderness parking lot and formalize parking and provide for proper drainage.	(CTA) Remediate the Curry Village dump at the Wilderness parking lot and formalize parking and provide for proper drainage.	(CTA) Remediate the Curry Village dump at the Wilderness parking lot and formalize parking and provide for proper drainage.	(CTA) Remediate the Curry Village dump at the Wilderness parking lot and formalize parking and provide for proper drainage.	(CTA) Remediate the Curry Village dump at the Wilderness parking lot and formalize parking and provide for proper drainage.
TRAN-2-016	2	Camp 4 Parking	The Camp 4 parking lot is inadequately sized for overnight parking and trailhead parking. Also, the demand for day-use parking in the area exceeds the supply.	In place of the old gas station, establish a new 41-space parking lot for Camp 4 campground.	The Camp 4 parking lot is inadequately sized for current levels of overnight and trailhead parking. There are a total of 89 parking spaces in the main Camp 4 parking lot. Currently, there are 29 overnight vehicles overflow across the road and 33 day-use vehicles overflow across the road.	(CTA) In place of the old gas station, establish a new 41-space parking lot for Camp 4 campground.	(CTA) In place of the old gas station, establish a new 41-space parking lot for Camp 4 campground.	(CTA) In place of the old gas station, establish a new 41-space parking lot for Camp 4 campground.	(CTA) In place of the old gas station, establish a new 41-space parking lot for Camp 4 campground.	(CTA) In place of the old gas station, establish a new 41-space parking lot for Camp 4 campground.
TRAN-2-017	2	Camp 4 Shuttle Stop	Camp 4 Shuttle Stop for El Capitan shuttle is not a formal, appropriately designed shuttle stop.	Construct a shuttle bus stop near Camp 4.	Camp 4 shuttle stop is not a formal stop.	(CTA) Construct a shuttle bus stop near Camp 4.	(CTA) Construct a shuttle bus stop near Camp 4.	(CTA) Construct a shuttle bus stop near Camp 4.	(CTA) Construct a shuttle bus stop near Camp 4.	(CTA) Construct a shuttle bus stop near Camp 4.
TRAN-2-018	2	El Capitan Shuttle Stop	The shuttle stop at El Capitan is not a formal, appropriately designed stop.	Construct a formal Shuttle bus stop in a location appropriate to the design for the restoration of the meadow and formalized access.	The shuttle stop at El Capitan is not a formal, appropriately designed stop.	(CTA) Construct a formal Shuttle bus stop in a location appropriate to the design for the restoration of the meadow and formalized access.	(CTA) Construct a formal Shuttle bus stop in a location appropriate to the design for the restoration of the meadow and formalized access.	(CTA) Construct a formal Shuttle bus stop in a location appropriate to the design for the restoration of the meadow and formalized access.	(CTA) Construct a formal Shuttle bus stop in a location appropriate to the design for the restoration of the meadow and formalized access.	(CTA) Construct a formal Shuttle bus stop in a location appropriate to the design for the restoration of the meadow and formalized access.
TRAN-2-019	2	Yosemite Village Day-Use Parking Area: Wayfinding	Visitors have difficulty finding visitor facilities, including the Visitor Center, from the current Yosemite Village Day-use Parking Area (Camp 6).	Repurpose the Village Sport Shop to public use and remove the Arts and Activities Center (Bank Building). Create pathways leading from the Yosemite Village Day-use Parking Area (Camp 6) to the Village Sport Shop building.	Visitors have difficulty finding visitor facilities, including the Visitor Center, from the current Yosemite Village Day-use Parking Area (Camp 6) .	(CTA )Repurpose the Village Sport Shop to public use and remove the Arts and Activities Center (Bank Building). Create pathways leading from the Yosemite Village Day-use Parking Area to the Village Sport Shop building.	(CTA )Repurpose the Village Sport Shop to public use and remove the Arts and Activities Center (Bank Building). Create pathways leading from the Yosemite Village Day-use Parking Area to the Village Sport Shop building.	(CTA )Repurpose the Village Sport Shop to public use and remove the Arts and Activities Center (Bank Building). Create pathways leading from the Yosemite Village Day-use Parking Area to the Village Sport Shop building.	(CTA )Repurpose the Village Sport Shop to public use and remove the Arts and Activities Center (Bank Building). Create pathways leading from the Yosemite Village Day-use Parking Area to the Village Sport Shop building.	(CTA )Repurpose the Village Sport Shop to public use and remove the Arts and Activities Center (Bank Building). Create pathways leading from the Yosemite Village Day-use Parking Area to the Village Sport Shop building.

Action Code	Segment	Project Name	Issue Statement	Common To All	Alternative 1 ( No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
TRAN-2-020	2	Yosemite Village Day-use Parking Area: Day-Use Parking Area	The Yosemite Village Day-use Parking Area is a six-acre dirt lot, currently being used to park approximately 517 vehicles on peak days using directed parking. There are 237 Yosemite Village parking spaces. Demand for day parking exceeds supply during summer peak use periods.		Yosemite Village Day-use Parking Area (Camp 6) is an approx. 6 acre dirt lot, currently being used to park approximately 517 vehicles on peak days using directed parking. There are 237 Yosemite Village parking spaces.	Move Yosemite Village Day-use Parking Area parking northward outside the 10-year floodplain and reroute Northside Drive south of the parking area, thus eliminating the need for a pedestrian underpass or roundabouts. Formalize the Yosemite Village Day-use Parking Area with a total of 550 parking places by redeveloping part of the current administrative footprint as parking.	Move Yosemite Village Day-use Parking Area northward outside the 10-year floodplain and reroute Northside Drive south of the parking area, thus eliminating the need for a pedestrian underpass or roundabouts. Formalize the Yosemite Village Day-use Parking Area with a total of 550 parking places by redeveloping part of the current administrative footprint as parking.	Move Yosemite Village Day-use Parking Area northward 150 feet away from the river to facilitate riparian restoration goals. Formalize the Yosemite Village Day-use Parking Area with a total of 750 parking places by redeveloping part of the current administrative footprint as parking.	Move Yosemite Village Day-use Parking Area northward 150 feet away from the river to facilitate riparian restoration goals. Formalize the Yosemite Village Day-use Parking Area with a total of 850 parking places by redeveloping part of the current administrative footprint as parking.	Move Yosemite Village Day-use Parking Area northward 150 feet away from the river to facilitate riparian restoration goals. Formalize the Yosemite Village Day-use Parking Area with a total of 850 parking places by redeveloping part of the current administrative footprint as parking.
TRAN-2-021	2	Yosemite Lodge: Highland Court	Currently, there is no parking at Highland Court, due to the placement of temporary housing in the parking lot, after the 1997 flood.		Currently, there is no parking at Highland Court, due to the placement of temporary housing in the parking lot, after the 1997 flood.	Area converted to walk-in campground (See Yosemite Lodge: re-purposed as camping)	Relocate the existing tour bus drop-off area to the Highland Court area to provide 3 bus loading/unloading spaces.	Relocate the existing tour bus drop-off area to the Highland Court area to provide 3 bus loading/unloading spaces.	Relocate the existing tour bus drop-off area to the Highland Court area to provide 3 bus loading/unloading spaces.	Relocate the existing tour bus drop-off area to the Highland Court area to provide 3 bus loading/unloading spaces.
RES-3-001	3	Cascades picnic area: abandoned infrastructure	Abandoned infrastructure (no longer in use) including a picnic table-sized concrete block, surface concrete, asphalt and 1-2' base material (rock) prevents river from shaping this area and impedes free flow during high water events.	Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock.	At the Cascade Picnic Area there is abandoned infrastructure including a picnic table-sized concrete block, surface concrete, asphalt and 1-2 feet base material (rock).	(CTA) Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock.	(CTA) Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock.	(CTA) Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock.	(CTA) Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock.	(CTA) Remove abandoned infrastructure including cement block, surface concrete and asphalt and imported rock.
RES-3-002	3	35; Cascade Falls viewpoint	The growth of conifer and oak trees will affect views of Cascade Falls where seen by visitors from El Portal Road.	Selectively remove conifers to maintain views. Leave oaks due to their protection as an ethnographic ORV.	The growth of conifer and oak trees affect views of Cascade Falls where seen by visitors from El Portal Road.	(CTA) Selectively remove conifers to maintain views. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively remove conifers to maintain views. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively remove conifers to maintain views. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively remove conifers to maintain views. Leave oaks due to their protection as an ethnographic ORV.	(CTA) Selectively remove conifers to maintain views. Leave oaks due to their protection as an ethnographic ORV.
FAC-4-002	4	Abbeville and Trailer Village housing	The Abbeville and Trailer Village area are currently used for temporary employees or employees that work for one of the park partners. The area is underutilized and represents an area that could be used by the park for additional infrastructure.	All housing re-development in this area will be outside the 100-year floodplain. Other redevelopment will be outside of the 150-foot riparian buffer.	The Abbeville and Trailer Village area is located in El Portal adjacent to the river. The area is outside the 100-year floodplain. It is used for housing for temporary NPS employees or employees that work for park partners. The area is underutilized and could be converted to a more efficient land use.	This area would become both concessioner housing and administrative camping. To facilitate removal of temporary employee housing in Yosemite Valley, develop high-density housing units here for 405 employees. Also construct a group administrative campground here to replace Yellow Pine Administrative Campground removed from Yosemite Valley.(CTA) Remove or relocate 36 existing private residences. Former footprints within the 150-foot riparian buffer would be ecologically restored. All housing re-development in this area will be outside the 100-year floodplain. Other redevelopment will be outside of the 150-foot riparian buffer.	Continue to provide for housing land use for 40 employees and volunteers at this location. (CTA) Remove or relocate 36 existing private residences. Former footprints within the 150-foot riparian buffer would be ecologically restored. All housing re-development in this area will be outside the 100-year floodplain. Other redevelopment will be outside of the 150-foot riparian buffer.	Continue to provide for housing land use for 40 employees and volunteers at this location. (CTA) Remove or relocate 36 existing private residences. Former footprints within the 150-foot riparian buffer would be ecologically restored. All housing re-development in this area will be outside the 100-year floodplain. Other redevelopment will be outside of the 150-foot riparian buffer.	Continue to provide for housing land use for 40 employees and volunteers at this location. (CTA) Remove or relocate 36 existing private residences. Former footprints within the 150-foot riparian buffer would be ecologically restored. All housing re-development in this area will be outside the 100-year floodplain. Other redevelopment will be outside of the 150-foot riparian buffer.	This area would become concessioner housing. Develop high-density housing units here for 258 employees to accommodate removal of temporary employee housing in Yosemite Valley,. (CTA) Remove or relocate 36 existing private residences. Former footprints within the 150-foot riparian buffer would be ecologically restored. All housing re-development in this area will be outside the 100-year floodplain. Other redevelopment will be outside of the 150-foot riparian buffer.
FAC-4-003	4	Old El Portal Residential Area	El Portal was placed under Park jurisdiction for the purposes of administrative use, including office space and employee housing, in order to alleviate the pressure on the Valley.	Construct infill housing units, providing 12 employee beds, in vacant lots in old El Portal to facilitate removal of temporary housing in Yosemite Valley.	There are nine vacant lot sites in old El Portal.	(CTA) Construct infill housing units, providing 12 employee beds, in vacant lots in old El Portal to facilitate removal of temporary housing in Yosemite Valley.	(CTA) Construct infill housing units, providing 12 employee beds, in vacant lots in old El Portal to facilitate removal of temporary housing in Yosemite Valley.	(CTA) Construct infill housing units, providing 12 employee beds, in vacant lots in old El Portal to facilitate removal of temporary housing in Yosemite Valley.	(CTA) Construct infill housing units, providing 12 employee beds, in vacant lots in old El Portal to facilitate removal of temporary housing in Yosemite Valley.	(CTA) Construct infill housing units, providing 12 employee beds, in vacant lots in old El Portal to facilitate removal of temporary housing in Yosemite Valley.
FAC-4-004	4	Rancheria Flat	El Portal was placed under park jurisdiction for the purposes of administrative use, including office space and employee housing, in order to alleviate the pressure on Yosemite Valley.		There are vacant lots in the Rancheria Flat area of El Portal.	Build new units, away from sensitive resources/ORVs, for a total of 9 employee beds.	Build 1 dormitory for 12 employees plus units for 7 additional employees, away from sensitive resources/ORVs, for a total of 19 employee beds.	Build 8 dormitories (12 employees each), away from sensitive resources/ORVs, for a total of 96 employee beds.	Build 7 dormitories (12 employees each), away from sensitive resources/ORVs, for a total of 84 employee beds	Build 3 dormitories (12 employees each) and units for 8 additional employees, away from sensitive resources/ORVs, for a total of 44 employee beds.



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FAC-4-005	4	Odger's fuel storage facility: located in floodplain	Presence of this facility in the floodplain is not in compliance with Director's Order 77-2 NPS Floodplains Guidelines that require fuel storage facilities to be located outside the 500-year floodplain.	(CTA) Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompect soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.	Presence of this facility in the floodplain is not in compliance with DO 77-2 NPS Floodplains Guidelines which require fuel storage facilities to be located outside of the 500-year floodplain.	(CTA) Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompect soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.	(CTA) Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompect soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.	(CTA) Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompect soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.	(CTA) Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompect soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.	(CTA) Remove bulk fuel storage facility, all associated development, and non-native fill from the floodplain. Decompect soils, and plant appropriate native plant species, including valley oak. Relocate the fuel storage area outside the Merced River corridor or find an alternate source for emergency fuel supplies.
RES-4-002	4	Old El Portal: parking and development in valley oaks	Seedling recruitment within the rare floodplain community of valley oaks in Old El Portal is limited by competition from invasive species, parking under the driplines of trees, associated soil compaction, herbivory, and existing development. Valley oaks are also sensitive to overwatering, pruning, grade changes, and asphalt covering the root system.	(CTA PORTION) Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D).	The valley oak population at El Portal exists in a generally protected state, but oak seedling recruitment is limited by competition from invasive species, parking under the driplines of trees and associated soil compaction, herbivory, and existing development. Valley oaks are also sensitive to overwatering, pruning, grade changes, and asphalt covering the root system.	(CTA PORTION) Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D).  Also, create a valley oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompect soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.	(CTA PORTION) Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D).  Also, create a valley oak recruitment area of 2.25 acres in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompect soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.	(CTA PORTION) Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D).  Also, create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompect soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.	(CTA PORTION) Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D).  Also, create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompect soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.	(CTA PORTION) Restore the rare floodplain community of valley oaks in Old El Portal through implementation of mitigation measures related to invasive species removal, overwatering, tree pruning, and prohibiting grading and parking in the dripline (see Appendix D).  Also, create a valley oak recruitment area of 1 acre in Old El Portal in the vicinity of the current Odger's bulk fuel storage area, including adjacent parking lots. Decompect soils, plant appropriate native understory plant species, and treat invasive plants. Prohibit new building construction within the oak recruitment area.
RES-4-003	4	CA-MRP-0250/H	Informal trails, non-essential gravel roads, and visitor use contribute to archeological site disturbances at CA-MRP-0250/H in Old El Portal.	Remove informal trails and non-essential roads	Informal trails, non-essential gravel roads, and visitor use contribute to archeological site disturbances at CA-MRP-0250/H in Old El Portal.	(CTA) Remove informal trails and non-essential roads	(CTA) Remove informal trails and non-essential roads	(CTA) Remove informal trails and non-essential roads	(CTA) Remove informal trails and non-essential roads	(CTA) Remove informal trails and non-essential roads
RES-4-004	4	CA-MRP-0251/H	Informal trails, non-essential gravel roads, and visitor use contribute to archeological site disturbances at CA-MRP-0251/H in Old El Portal.	Remove informal trails.	Informal trails, non-essential gravel roads, and visitor use contribute to archeological site disturbances at CA-MRP-0251/H in Old El Portal.	(CTA) Remove informal trails.	(CTA) Remove informal trails.	(CTA) Remove informal trails.	(CTA) Remove informal trails.	(CTA) Remove informal trails.
RES-4-005	4	Greenemeyer sand pit: flood and riparian plant impacts from fill material	Greenemeyer sand pit contains fill material that precludes natural flooding and regeneration of riparian plant communities.	Restore the Greenemeyer sand pit to natural conditions; remove fill material and recontour. Retain road for river and utility access.	Greenemeyer sand pit contains fill material that precludes natural flooding and regeneration of riparian plant communities.	(CTA) Restore the Greenemeyer sand pit to natural conditions; remove fill material and recontour. Retain road for river and utility access.	(CTA) Restore the Greenemeyer sand pit to natural conditions; remove fill material and recontour. Retain road for river and utility access.	(CTA) Restore the Greenemeyer sand pit to natural conditions; remove fill material and recontour. Retain road for river and utility access.	(CTA) Restore the Greenemeyer sand pit to natural conditions; remove fill material and recontour. Retain road for river and utility access.	(CTA) Restore the Greenemeyer sand pit to natural conditions; remove fill material and recontour. Retain road for river and utility access.
RES-4-006	4	El Portal: river confined by riprap and road	The Merced River in El Portal is confined by riprap and Highway 140.	Develop standards for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide Caltrans with recommendations when repair/replacement is necessary in Segment 4.	The Merced River in El Portal is confined by riprap and Highway 140.	(CTA) Develop standards for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide Caltrans with recommendations when repair/replacement is necessary in Segment 4.	(CTA) Develop standards for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide Caltrans with recommendations when repair/replacement is necessary in Segment 4.	(CTA) Develop standards for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide Caltrans with recommendations when repair/replacement is necessary in Segment 4.	(CTA) Develop standards for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide Caltrans with recommendations when repair/replacement is necessary in Segment 4.	(CTA) Develop standards for revetment construction and repair throughout the river corridor. Vertical walls should be used wherever possible. Provide Caltrans with recommendations when repair/replacement is necessary in Segment 4.

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RES-4-007	4	El Portal NPS Maintenance and administrative complex: roadside parking.	The off-street and roadside parking areas located between the Merced River and Foresta Road were not designed or built to prevent water-quality contamination from automotive fluids, surface water runoff or sediment transport.	Pave the existing dirt parking area located across Foresta Road from the NPS Warehouse Building by using best management practices to formalize and maximize parking within the existing footprint. Restore the informal roadside parking, which is southeast of the dirt parking area, between Foresta Road and the Merced River.	The off-street and roadside parking areas located between the Merced River and Foresta Road were not designed or built to prevent water quality contamination from automotive fluids, surface water runoff or sediment transport.	(CTA) Pave the existing dirt parking area located across Foresta Road from the NPS Warehouse Building by using best management practices to formalize and maximize parking within the existing footprint. Restore the informal roadside parking, which is southeast of the dirt parking area, between Foresta Road and the Merced River.	(CTA) Pave the existing dirt parking area located across Foresta Road from the NPS Warehouse Building by using best management practices to formalize and maximize parking within the existing footprint. Restore the informal roadside parking, which is southeast of the dirt parking area, between Foresta Road and the Merced River.	(CTA) Pave the existing dirt parking area located across Foresta Road from the NPS Warehouse Building by using best management practices to formalize and maximize parking within the existing footprint. Restore the informal roadside parking, which is southeast of the dirt parking area, between Foresta Road and the Merced River.	(CTA) Pave the existing dirt parking area located across Foresta Road from the NPS Warehouse Building by using best management practices to formalize and maximize parking within the existing footprint. Restore the informal roadside parking, which is southeast of the dirt parking area, between Foresta Road and the Merced River.	(CTA) Pave the existing dirt parking area located across Foresta Road from the NPS Warehouse Building to formalize and maximize parking within the existing footprint. Restore the informal roadside parking, which is southeast of the dirt parking area, between Foresta Road and the Merced River.
RES-4-008	4	Riparian Buffer at Abbieville and Trailer Village	Abbieville and the Trailer Village contain impacts of former development including paved roads and parking and compacted soils within 150' of the riverbanks.	Remove development, asphalt and imported fill; recontour and plant native riparian species and oaks within the 150-foot riparian buffer.	Abbieville and the Trailer Village contain impacts of former development including paved roads and parking and compacted soils within 150' of the riverbanks.	(CTA) Remove development, asphalt and imported fill; recontour and plant native riparian species and oaks within the 150-foot riparian buffer.	(CTA) Remove development, asphalt and imported fill; recontour and plant native riparian species and oaks within the 150-foot riparian buffer.	(CTA) Remove development, asphalt and imported fill; recontour and plant native riparian species and oaks within the 150-foot riparian buffer.	(CTA) Remove development, asphalt and imported fill; recontour and plant native riparian species and oaks within the 150-foot riparian buffer.	(CTA) Remove development, asphalt and imported fill; recontour and plant native riparian species and oaks within the 150-foot riparian buffer.
TRAN-4-001	4	El Portal remote visitor parking	Demand for day-use parking exceeds supply. There is also need to provide the appropriate level of day-use parking that is protective of river values.		The Abbieville and Trailer Village area is located in El Portal adjacent to the River. The area is outside the 100-year floodplain. It is used for housing for temporary NPS employees or employees that work for Park Partners. The area is underutilized and could be converted to a more efficient land use.	No new overflow day-use parking spaces would be added here. A portion of this area would be for group administrative camping removed from Yellow Pine Administrative Campground in Yosemite Valley.	No new parking spaces added at the Abbieville/Trailer Village area.	Develop El Portal remote day-use visitor parking area at the Abbieville/Trailer Village area to provide 200 spaces of visitor parking serviced by regional transit.	Develop El Portal Remote Visitor Parking Area in the Abbieville/Trailer Village area to provide 200 spaces of visitor parking serviced by regional transit.	Develop El Portal Remote Visitor Parking Area at the Abbieville/Trailer Village area to provide 200 spaces of visitor parking serviced by regional transit.
RES-5-001	5	CA-MRP-0218	Informal trails and visitor use cause ground disturbing impacts to surface and sub-surface archeological resources at CA-MRP-0218.	Remove informal trails and charcoal rings. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker).	Informal trails and visitor use cause ground disturbing impacts to surface and sub-surface archeological resources at CA-MRP-0218.	(CTA) Remove informal trails and charcoal rings. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker).	(CTA) Remove informal trails and charcoal rings. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker).	(CTA) Remove informal trails and charcoal rings. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker).	(CTA) Remove informal trails and charcoal rings. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker).	(CTA) Remove informal trails and charcoal rings. Restrict Wilderness camping in the area of the rock rings (camping allowed past particular marker).
RES-6-001	6	Wawona Impoundment: effects to free-flowing condition	Surface water withdrawals and impoundment affect the free-flowing condition of the river; excessive water withdrawals limit aquatic life.	Retain current water collection and distribution system, implementing the water conservation plan related to the minimum flow analysis for the South Fork.	Surface water withdrawals reduce the flow of water during dry summer months. The impoundment is within the bed and banks of the river.	(CTA) Retain current water collection and distribution system, implementing the water conservation plan related to the minimum flow analysis for the South Fork.	(CTA) Retain current water collection and distribution system, implementing the water conservation plan related to the minimum flow analysis for the South Fork.	(CTA) Retain current water collection and distribution system, implementing the water conservation plan related to the minimum flow analysis for the South Fork.	(CTA) Retain current water collection and distribution system, implementing the water conservation plan related to the minimum flow analysis for the South Fork.	(CTA) Retain current water collection and distribution system, implementing the water conservation plan related to the minimum flow analysis for the South Fork.
FAC-7-001	7	Wawona Maintenance yard: Riparian Impacts	The footprint of the Wawona maintenance yard extends to the riverbank. The yard is devoid of vegetation, soils are compacted and non-native fill material covers the lot. Soil and sand piles, vehicles and items such as campfire rings are stored here.	Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer and restore a native ecosystem. Provide a 150-foot wide restoration buffer.	The footprint of the Wawona maintenance yard extends to the riverbank. The yard is devoid of vegetation, soils are compacted and non-native fill material covers the lot. Soil and sand piles, vehicles and items such as campfire rings are stored here.	(CTA) Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer and restore a native ecosystem. Provide a 150-foot wide restoration buffer.	(CTA) Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer and restore a native ecosystem. Provide a 150-foot wide restoration buffer.	(CTA) Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer and restore a native ecosystem. Provide a 150-foot wide restoration buffer.	(CTA) Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer and restore a native ecosystem. Provide a 150-foot wide restoration buffer.	(CTA) Remove staged materials, abandoned utilities, vehicles, and parking lot from the riparian buffer and restore a native ecosystem. Provide a 150-foot wide restoration buffer.
FAC-7-002	7	Wawona public restrooms	There are inadequate public restroom facilities in the Wawona day-use area.	Replace the existing public restroom facilities next to the Wawona Store with larger restrooms.	There are inadequate public restroom facilities in the Wawona day-use area.	(CTA) Replace the existing public restroom facilities next to the Wawona Store with larger restrooms.	(CTA) Replace the existing public restroom facilities next to the Wawona Store with larger restrooms.	(CTA) Replace the existing public restroom facilities next to the Wawona Store with larger restrooms.	(CTA) Replace the existing public restroom facilities next to the Wawona Store with larger restrooms.	(CTA) Replace the existing public restroom facilities next to the Wawona Store with larger restrooms.
FAC-7-003	7	Wawona Hotel: Services and Facilities	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.	Retain hotel restaurant and swimming pool.	Wawona Hotel restaurant, swimming pool, and tennis courts are used by overnight guests at the Wawona Hotel.	(CTA) Retain hotel restaurant and swimming pool.Remove Wawona tennis court.	(CTA) Retain hotel restaurant and swimming pool.Remove Wawona tennis court.	(CTA) Retain hotel restaurant and swimming pool.Retain Wawona tennis court.	(CTA) Retain hotel restaurant and swimming pool.Retain Wawona tennis court.	(CTA) Retain hotel restaurant and swimming pool.Retain Wawona tennis court.

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FAC-7-004	7	Wawona Maintenance yard: Operations	The facilities and layout at the Wawona maintenance yard are not optimal for operational efficiency.	Construct a 4,500-square-foot building and grounds maintenance facility, a 6,800-square-foot combined structural and wildland fire station, and a 4,000-square-foot roads maintenance facility. Rehabilitate the existing California Conservation Corp structures for potential re-use.	The facilities and layout at the Wawona maintenance yard are not optimal for operational efficiency.	(CTA) Construct a 4,500-square-foot building and grounds maintenance facility, a 6,800 square foot combined structural and wildland fire station, and a 4,000 square foot roads maintenance facility. Rehabilitate the existing California Conservation Corp structures for potential re-use.	(CTA) Construct a 4,500-square-foot building and grounds maintenance facility, a 6,800-square-foot combined structural and wildland fire station, and a 4,000-square-foot roads maintenance facility. Rehabilitate the existing California Conservation Corp structures for potential re-use.	(CTA) Construct a 4,500-square-foot building and grounds maintenance facility, a 6,800-square-foot combined structural and wildland fire station, and a 4,000-square-foot roads maintenance facility. Rehabilitate the existing California Conservation Corp structures for potential re-use.	(CTA) Construct a 4,500-square-foot building and grounds maintenance facility, a 6,800-square-foot combined structural and wildland fire station, and a 4,000-square-foot roads maintenance facility. Rehabilitate the existing California Conservation Corp structures for potential re-use.	(CTA) Construct a 4,500-square-foot building and grounds maintenance facility, a 6,800-square-foot combined structural and wildland fire station, and a 4,000-square-foot roads maintenance facility. Rehabilitate the existing California Conservation Corp structures for potential re-use.
FAC-7-005	7	Wawona Stables	Public comments suggest that the NPS should define the environmental effects and capacity of the built environment in Yosemite for various buildings, areas and kinds of use.		The concessioner stables operation would continue in its present location, offering day rides.	The stables operation and day rides are eliminated. The Wawona stock use campground (2 sites) is relocated to this area.	The stables operation and day rides are eliminated. The Wawona stock use campground (2 sites) is relocated to this area.	The stables operation and day rides are eliminated. The Wawona stock use campground (2 sites) is relocated to this area.	The stables operation and day rides are retained. The Wawona stock use campground (2 sites) is relocated to another area near the Wawona Maintenance Yard.	The stables operation and day rides are eliminated. The Wawona stock use campground (2 sites) is relocated to this area.
ONA-7-001	7	Wawona Campground: campground activity near river	The proximity of camp sites to the river causes trampling and riverbank erosion that inhibits riparian vegetation growth.		This campground contains 97 campsites, 96 sites and 1 groups site. No administrative campsites.	Retains 64 sites and one group site. Remove 32 sites that are either within the 100-year floodplain or in culturally sensitive areas.	Retains 69 sites and one group site. Remove 27 sites that are either within 150 feet of the river or in culturally sensitive areas.	Retains 69 sites and one group site. Remove 27 sites that are either within 150 feet of the river or in culturally sensitive areas.	Retains 83 sites and one group site. Remove 13 sites that are either within 100 feet of the river or in culturally sensitive areas.	Retains 83 sites and one group site. Remove 13 sites that are either within 100 feet of the river or in culturally sensitive areas.
REC-7-001	7	Wawona Swinging Bridge area	Access at the Wawona Swinging Bridge is not well-delineated. Visitors access the river through private property. There is a lack of public amenities such as toilets and waste disposal facilities.	Provide access on the south side of the river on public land, delineating a trail and formal access that includes restrooms, waste disposal, and parking.	Access at the Wawona Swinging Bridge is not well-delineated. Visitors access the river through private property. There is a lack of public amenities, such as toilets and waste disposal facilities.	(CTA) Provide access on the south side of the river on public land, delineating a trail and formal access that includes restrooms, waste disposal, and parking.	(CTA) Provide access on the south side of the river on public land, delineating a trail and formal access that includes restrooms, waste disposal, and parking.	(CTA) Provide access on the south side of the river on public land, delineating a trail and formal access that includes restrooms, waste disposal, and parking.	(CTA) Provide access on the south side of the river on public land, delineating a trail and formal access that includes restrooms, waste disposal, and parking.	(CTA) Provide access on the south side of the river on public land, delineating a trail and formal access that includes restrooms, waste disposal, and parking.
RES-7-001	7	CA-MRP-0374	Informal trails and hazard fuel buildup cause impacts to surface and sub-surface archeological resources at CA-MRP-0374.	Rehabilitate social trail and delineate access road.	Informal trails and hazard fuel buildup cause impacts to surface and sub-surface archeological resources at CA-MRP-0374.	(CTA) Rehabilitate social trail and delineate access road.	(CTA) Rehabilitate social trail and delineate access road.	(CTA) Rehabilitate social trail and delineate access road.	(CTA) Rehabilitate social trail and delineate access road.	(CTA) Rehabilitate social trail and delineate access road.
RES-7-002	7	CA-MRP-0008/H	Informal trails and variety of operational and visitor uses cause ground disturbing impacts to surface and sub-surface archeological resources at CA-MRP-0008/H.	Remove informal trails. Relocate camp sites out of archeological site. Also, relocate the campground to the Wawona Stables.	Informal trails and a variety of operational and visitor uses cause ground disturbing impacts to surface and sub-surface archeological resources at CA-MRP-0008/H.	(CTA) Remove informal trails. Relocate camp sites out of archeological site. Also, relocate the campground to the Wawona Stables.	(CTA) Remove informal trails. Relocate camp sites out of archeological site. Also, relocate the campground to the Wawona Stables.	(CTA) Remove informal trails. Relocate camp sites out of archeological site. Also, relocate the campground to the Wawona Stables.	(CTA) Remove informal trails. Relocate camp sites out of archeological site. Also, relocate the campground to the Wawona Maintenance Yard.	(CTA) Remove informal trails. Relocate camp sites out of archeological site. Also, relocate the campground to the Wawona Stables.
RES-7-003	7	CA-MRP-0168/0329/H	Wawona Campground is potentially causing localized adverse effects to site CA-MRP-168/329/H (Camp A.E. Wood). Ground disturbing activities associated with foot traffic and camping cause impacts to shallow deposit of historic artifacts and features.	Remove 7 campsites from Wawona Campground that cause potential impacts to the archeological site.	Wawona Campground is potentially causing localized adverse effects to site CA-MRP-168/329/H (Camp A.E. Wood). Ground disturbing activities associated with foot traffic and camping cause impacts to shallow deposit of historic artifacts and features.	(CTA) Remove 7 campsites from Wawona Campground that cause potential impacts to the archeological site.	(CTA) Remove 7 campsites from Wawona Campground that cause potential impacts to the archeological site.	(CTA) Remove 7 campsites from Wawona Campground that cause potential impacts to the archeological site.	(CTA) Remove 7 campsites from Wawona Campground that cause potential impacts to the archeological site.	(CTA) Remove 7 campsites from Wawona Campground that cause potential impacts to the archeological site.
RES-7-004	7	Wawona Golf Course and Golf Shop	Public comment has expressed both interest and concern with continuing to operate the Wawona golf course in a National Park.		The 9-hole golf course associated with the Wawona Hotel, and the retail and food service at the Golf Shop, would remain in use. Golf course removed (ecological restoration, spray field remains).	Golf course removed (ecological restoration, spray field remains) Wawona Golf Shop is repurposed.	Golf course removed (ecological restoration, spray field remains) Wawona Golf Shop is repurposed.	Golf course and Wawona Golf Shop remain.	Golf course and Wawona Golf Shop remain.	Golf course and Wawona Golf Shop remain.
RES-7-005	7	South Fork side channels: Abandoned infrastructure	Abandoned metal pipes in South Fork side channels dewater the terrace.	Remove abandoned pipes.	There is abandoned metal pipe in side channels on the South Fork Merced River that dewater the terrace.	(CTA) Remove abandoned pipes.	(CTA) Remove abandoned pipes.	(CTA) Remove abandoned pipes.	(CTA) Remove abandoned pipes.	(CTA) Remove abandoned pipes.
RES-7-006	7	Wawona Campground: septic system	Wawona Campground is served by septic tanks and leach fields. When the capacity is exceeded (or ultimately fails) there is a potential for effluent to migrate into ground water and the river.	Develop a waste water collection system. Build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant.	Wawona Campground is served by septic tanks and leach fields. When the capacity is exceeded (or ultimately fails), there is a potential for effluent to migrate into ground water and the river.	(CTA) Develop a waste water collection system. Build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant.	(CTA) Develop a waste water collection system. Build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant.	(CTA) Develop a waste water collection system. Build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant.	(CTA) Develop a waste water collection system. Build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant.	(CTA) Develop a waste water collection system. Build a pump station above the Wawona Campground to connect the facility to the existing waste water treatment plant.

Action Code	Segment	Project Name	Issue Statement	Common To All	Alternative 1 ( No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
RES-7-007	7	Wawona dump station: proximity to river	Wawona dump station is very close to the banks of the river.	Relocate the dump site to the Wawona Campground away from the river. Design and construct RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the river's OHWM.	Wawona dump station is very close to the banks of the river.	(CTA) Relocate the dump site to the Wawona Campground away from the river. Design and construct RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the river's OHWM.	(CTA) Relocate the dump site to the Wawona Campground away from the river. Design and construct RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the river's OHWM.	(CTA) Relocate the dump site to the Wawona Campground away from the river. Design and construct RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the river's OHWM.	(CTA) Relocate the dump site to the Wawona Campground away from the river. Design and construct RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the river's OHWM.	(CTA) Relocate the dump site to the Wawona Campground away from the river. Design and construct RV dump station on a new sewer line near the campground entrance, at least 150 feet away from the river's OHWM.
RES-7-008	7	South Fork Wawona Picnic Area: Effects on Riparian Zone and Visitor Experience	The South Fork Wawona picnic area is not delineated and has no formal river access point. Visitors access the river by creating social trails.	Delineate picnic area. Add formal river access point and path to river that encourages visitors to walk in the more resilient areas.	The South Fork Wawona picnic area is not delineated and has no formal river access point. Visitors access the river by creating social trails.	(CTA) Delineate picnic area. Add formal river access point and path to river that encourages visitors to walk in the more resilient areas.	(CTA) Delineate picnic area. Add formal river access point and path to river that encourages visitors to walk in the more resilient areas.	(CTA) Delineate picnic area. Add formal river access point and path to river that encourages visitors to walk in the more resilient areas.	(CTA) Delineate picnic area. Add formal river access point and path to river that encourages visitors to walk in the more resilient areas.	(CTA) Delineate picnic area. Add formal river access point and path to river that encourages visitors to walk in the more resilient areas.
RES-7-009	7	Wawona Store Picnic Area: Effects on Riparian Zone and Visitor Experience	The Wawona Store Picnic Area near Pioneer History Center has visitor use levels during peak periods that exceed the design of the existing infrastructure. There is no formal river access point here, and visitor use at this steep riverbank has caused loss of riparian vegetation, social trailing, and riverbank erosion.	Increase the number of picnic benches to accommodate more picnicking near the store. Harden the three steep river access points using rockwork or staircase construction to prevent further erosion. If needed, place fencing to direct visitors to these hardened access points. Add path to river that encourages visitors to walk in the more resilient areas.	The Wawona Store Picnic Area near Pioneer History Center has visitor use levels during peak periods that exceed the design of the existing infrastructure. There is no formal river access point here, and visitor use at this steep riverbank has caused loss of riparian vegetation, social trailing, and riverbank erosion.	(CTA) Increase the number of picnic benches to accommodate more picnicking near the store. Harden the three steep river access points using rockwork or staircase construction to prevent further erosion. If needed, place fencing to direct visitors to these hardened access points. Add path to river that encourages visitors to walk in the more resilient areas.	(CTA) Increase the number of picnic benches to accommodate more picnicking near the store. Harden the three steep river access points using rockwork or staircase construction to prevent further erosion. If needed, place fencing to direct visitors to these hardened access points. Add path to river that encourages visitors to walk in the more resilient areas.	(CTA) Increase the number of picnic benches to accommodate more picnicking near the store. Harden the three steep river access points using rockwork or staircase construction to prevent further erosion. If needed, place fencing to direct visitors to these hardened access points. Add path to river that encourages visitors to walk in the more resilient areas.	(CTA) Increase the number of picnic benches to accommodate more picnicking near the store. Harden the three steep river access points using rockwork or staircase construction to prevent further erosion. If needed, place fencing to direct visitors to these hardened access points. Add path to river that encourages visitors to walk in the more resilient areas.	(CTA) Increase the number of picnic benches to accommodate more picnicking near the store. Harden the three steep river access points using rockwork or staircase construction to prevent further erosion. If needed, place fencing to direct visitors to these hardened access points. Add path to river that encourages visitors to walk in the more resilient areas.
RES-7-010	7	CA-MRP-173/372/H	Wawona Hotel maintenance and usage includes impacts from construction, structures, roads, foot traffic on/off paths, parking, utilities, landscaping. Heavily eroded areas exist along river and creeks.	Develop site management plan. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds.	Wawona Hotel maintenance and usage includes impacts from construction, structures, roads, foot traffic on/off paths, parking, utilities, landscaping. Heavily eroded areas exist along river and creeks.	(CTA) Develop site management plan. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds.	(CTA) Develop site management plan. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds.	(CTA) Develop site management plan. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds.	(CTA) Develop site management plan. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds.	(CTA) Develop site management plan. Remove shoulder and off-road parking. Limit facility and concessionaire off -road vehicle travel/parking on hotel grounds.
RES-7-011	7	Wawona Stock Camp	The Wawona Stock Campground has two sites and is located in a very sensitive resource area.		The Wawona Stock Campground has two sites and is located in a very sensitive resource area.	Two stock use campground sites relocated from sensitive resource area to Wawona Stables.	Two stock use campground sites relocated from sensitive resource area to Wawona Stables.	Two stock use campground sites relocated from sensitive resource area to Wawona Stables.	Two stock use campground sites relocated to the Wawona Maintenance Yard area.	Two stock use campground sites relocated from sensitive resource area to Wawona Stables.
RES-7-012	7	CA-MRP-0171/172/254/516/H	Shoulder and off-road parking cause impacts to archeological resources on archeological site CA-MRP-0171/172/254/516/H.	Remove informal trails and shoulder and off-road parking.	Informal trails and visitor use cause ground disturbing impacts to surface and sub-surface archeological resources at CA-MRP-0218.	(CTA) Remove informal trails and shoulder and off-road parking.	(CTA) Remove informal trails and shoulder and off-road parking.	(CTA) Remove informal trails and shoulder and off-road parking.	(CTA) Remove informal trails and shoulder and off-road parking.	(CTA) Remove informal trails and shoulder and off-road parking.
RES-7-013	7	Wawona Hotel: Clark Cottage	The Wawona Hotel National Historic Landmark is overall in "good" condition. However, Clark Cottage is currently in "fair" condition overall, with contributing elements of the exterior of the building in "fair" to "poor" condition.	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Clark Cottage to bring the building to "good" condition.	The Wawona Hotel National Historic Landmark is overall in "good" condition. However, Clark Cottage is currently in "fair" condition overall, with contributing elements of the exterior of the building in "fair" to "poor" condition.	(CTA) Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Clark Cottage to bring the building to "good" condition.	(CTA) Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Clark Cottage to bring the building to "good" condition.	(CTA) Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Clark Cottage to bring the building to "good" condition.	(CTA) Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Clark Cottage to bring the building to "good" condition.	(CTA) Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at Clark Cottage to bring the building to "good" condition.
RES-7-014	7	Wawona Hotel: Main Hotel, Manager's Cottage, Annex Building	The Wawona Hotel National Historic Landmark is overall in "good" condition. While the Main Hotel, Manager's Cottage, and Annex Building are currently in "good" condition overall, some contributing elements of the buildings are in "fair" to "poor" condition.	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at the Main Hotel, Manager's Cottage, and Annex Building to bring the buildings to "good" condition.	The Wawona Hotel National Historic Landmark is overall in "good" condition. While the Main Hotel, Manager's Cottage, and Annex Building are currently in "good" condition overall, some contributing elements of the buildings are in "fair" to "poor" condition.	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at the Main Hotel, Manager's Cottage, and Annex Building to bring the buildings to "good" condition.	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at the Main Hotel, Manager's Cottage, and Annex Building to bring the buildings to "good" condition.	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at the Main Hotel, Manager's Cottage, and Annex Building to bring the buildings to "good" condition.	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at the Main Hotel, Manager's Cottage, and Annex Building to bring the buildings to "good" condition.	Follow the recommendations from the Wawona Hotel Historic Structures Report (2012) to address contributing elements in "poor" condition at the Main Hotel, Manager's Cottage, and Annex Building to bring the buildings to "good" condition.
TRAN-7-001	7	Wawona Store/Gas Station Area	There is not enough parking in the Wawona Store area to meet the demand for the Mariposa Grove overflow parking. This has caused people to park between the store and Chilnualna Falls road is creating pedestrian/vehicle conflicts.	Roadside parking between store and Chilnualna Falls Road removed. Day use parking remains, Mariposa Grove primary parking outside corridor, all shuttles remain, formalize parking for eight tour buses at Wawona Store.	Parking between the store and Chilnualna Falls road is creating pedestrian/vehicle conflicts.	(CTA) Roadside parking between store and Chilnualna Falls Road removed. Day use parking remains, Mariposa Grove primary parking outside corridor, all shuttles remain, formalize parking for eight tour buses at Wawona Store.	(CTA) Roadside parking between store and Chilnualna Falls Road removed. Day use parking remains, Mariposa Grove primary parking outside corridor, all shuttles remain, formalize parking for eight tour buses at Wawona Store.	(CTA) Roadside parking between store and Chilnualna Falls Road removed. Day use parking remains, Mariposa Grove primary parking outside corridor, all shuttles remain, formalize parking for eight tour buses at Wawona Store.	(CTA) Roadside parking between store and Chilnualna Falls Road removed. Day use parking remains, Mariposa Grove primary parking outside corridor, all shuttles remain, formalize parking for eight tour buses at Wawona Store.	(CTA) Roadside parking between store and Chilnualna Falls Road removed. Day use parking remains, Mariposa Grove primary parking outside corridor, all shuttles remain, formalize parking for eight tour buses at Wawona Store.

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TRAN-7-002	7	Wawona Store: bus stop	The bus stop at Wawona Store was not designed (i.e., inadequate seating, no sun cover) to accommodate the volume and type of use it currently supports.	Re-design bus stop (for both tour buses and shuttles) to accommodate visitor use	The bus stop at Wawona Store was not designed (i.e., inadequate seating, no sun cover) to accommodate the volume and type of use it currently supports.	(CTA) Re-design bus stop (for both tour buses and shuttles) to accommodate visitor use	(CTA) Re-design bus stop (for both tour buses and shuttles) to accommodate visitor use	(CTA) Re-design bus stop (for both tour buses and shuttles) to accommodate visitor use	(CTA) Re-design bus stop (for both tour buses and shuttles) to accommodate visitor use	(CTA) Re-design bus stop (for both tour buses and shuttles) to accommodate visitor use
NONE	AS	Re-introduce Declining Amphibian and Reptile Species	Of the 11 native amphibians found, four amphibian species have a federal or state special status due to population declines. The foothill yellow-legged frog ( <i>Rana boylei</i> ), which is a California Species of Concern, has not been documented in the park in many years and may be extirpated. Of the 22 native reptiles found, only one has a federal or state status. The Western pond turtle ( <i>Actinemys marmota</i> ), which is a California Species of Concern, is declining in the park due to habitat loss and non-native predators, such as bullfrogs.	In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize the study the Western pond turtle and foothill yellow-legged frog.	In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed.	(CTA) In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize the study the Western pond turtle and foothill yellow-legged frog.	(CTA) In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize the study the Western pond turtle and foothill yellow-legged frog.	(CTA) In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize the study the Western pond turtle and foothill yellow-legged frog.	(CTA) In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize the study the Western pond turtle and foothill yellow-legged frog.	(CTA) In accordance with NPS Policy, management direction would continue toward removal of non-native species, and re-introduction of extirpated or declining species as priorities and opportunities are developed. Prioritize the study the Western pond turtle and foothill yellow-legged frog.
REC-AS-001	AS	boating, swimming and water play	Public comment has reflected both support for current and expanded boating opportunities as well as opposition to boating. Visitor use associated with boating has caused localized impacts to the riverbanks at the put-in and take-out, and allows easy access to sensitive riverbanks along the river.	Swimming and water play are allowed in all segments except Segment 6, impoundment.	Swimming and water play are allowed on all segments. Boating is allowed in Segment 2 between Stoneman Bridge and Sentinel Beach Picnic Area, and on the South Fork of the Merced between Swinging Bridge and the park boundary. During periods of high flows (> 6.5 feet at Sentinel Bridge,) boating in Segment 2 is prohibited for safety reasons.	Swimming and water play allowed in all segments except 6, impoundment. No permits required for private boating. No commercial boating. Boating allowed on all segments except 6, impoundment. Private use unlimited on Segment 1, 5, and 8. Private use limited to 25 trips per day in Segment 2 between the Pines Campgrounds and Sentinel Beach. 5 boats per day in Segment 3 and 5 boats per day in Segment 4. Raft put-in in Segment 2 at designated locations within Pines campgrounds and day use picnic sites; take out at Sentinel Beach.	Swimming and water play allowed in all segments except 6, impoundment. No permits required for private boating. No commercial boating. Boating allowed on all segments except 6, impoundment. Private use unlimited on Segment 1, 5, and 8. Private use limited to 50 trips per day in Segment 2 between Housekeeping Camp and Sentinel Beach. 5 boats per day in Segment 3 and 5 boats per day in Segment 4. Raft put-in in Segment 2 located at Housekeeping Camp; take-outs at Sentinel Beach and Cathedral Beach.	Swimming and water play allowed in all segments except 6, impoundment. Permits required for private boating. Commercial boating by commercial use authorization. Boating allowed on all segments except 6, impoundment. Private use limited to 5 boats per day with backcountry permit on Segment 1, 5, and 8. Private use limited to 100 trips per day in Segment 2 between put in at Clark's Bridge and take out at Cathedral Beach. Private use limited to 10 boats per day in Segment 3 and 10 boats per day in Segment 4. Private use limited to 5 boats per day in Segment 7. Commercial Use Authorization for 75 boats at one time in Segment 2, between put-in at Housekeeping Camp West Beach and take-out at Sentinel Beach.	Swimming and water play allowed in all segments except 6, impoundment. Permits required for private boating. No commercial boating. Boating allowed on all Segments, except Segment 6, impoundment and 3, Gorge. Private use limited to 10 boats per day with backcountry permit on Segment 1, 5, and 8. Private use limited to 100 trips per day in Segment 2 between put in at Lower Rivers Day Use Area and take out at Sentinel Beach. Private use unrestricted on Segment 4. Private use limited to 10 boats per day in Segment 7.	Swimming and water play allowed in all segments except 6, impoundment. Permits required for private boating. Commercial boating by concessioner. Boating allowed on all Segments, except Segment 6, impoundment and 3, Gorge. Private use limited to 10 boats per day with backcountry permit on Segment 1, 5, and 8. Private use limited to 150 trips per day in Segment 2 between put in at Clark's Bridge and take out below Pohono Bridge. Private use unrestricted on Segment 4. Private use limited to 10 boats per day in Segment 7. Concessions contract for 100 boats at one time (~250 trips per day) in Segment 2, between put-in at Housekeeping Camp and take-out at Sentinel Beach.
RES-AS-001	AS	Abandoned underground infrastructure	Abandoned underground infrastructure such as remnants of former sewer treatment facilities, sewer and water line, and man holes can alter hydrology and lead to lowered water tables in meadows and wetlands.	Remove abandoned underground infrastructure that alters hydrology including remnants of former sewer treatment facilities, sewer and water line, and man holes. Where infrastructure is removed or relocated and the area to be restored to natural conditions, soils will be decompacted and recontoured and the area revegetated with appropriate native plants. Individual actions will be subject to NHPA, Section 106 review.	Abandoned underground infrastructure such as remnants of former sewer treatment facilities, sewer and water line, and manholes can alter hydrology and lead to lowered water tables in meadows and wetlands.	(CTA) Remove abandoned underground infrastructure that alters hydrology including remnants of former sewer treatment facilities, sewer and water line, and manholes. Where infrastructure is removed or relocated and the area to be restored to natural conditions, soils will be decompacted and recontoured and the area revegetated with appropriate native plants. Individual actions will be subject to NHPA, Section 106 review.	(CTA) Remove abandoned underground infrastructure that alters hydrology including remnants of former sewer treatment facilities, sewer and water line, and manholes. Where infrastructure is removed or relocated and the area to be restored to natural conditions, soils will be decompacted and recontoured and the area revegetated with appropriate native plants. Individual actions will be subject to NHPA, Section 106 review.	(CTA) Remove abandoned underground infrastructure that alters hydrology including remnants of former sewer treatment facilities, sewer and water line, and manholes. Where infrastructure is removed or relocated and the area to be restored to natural conditions, soils will be decompacted and recontoured and the area revegetated with appropriate native plants. Individual actions will be subject to NHPA, Section 106 review.	(CTA) Remove abandoned underground infrastructure that alters hydrology including remnants of former sewer treatment facilities, sewer and water line, and manholes. Where infrastructure is removed or relocated and the area to be restored to natural conditions, soils will be decompacted and recontoured and the area revegetated with appropriate native plants. Individual actions will be subject to NHPA, Section 106 review.	(CTA) Remove abandoned underground infrastructure that alters hydrology including remnants of former sewer treatment facilities, sewer and water line, and ma holes. Where infrastructure is removed or relocated and the area to be restored to natural conditions, soils will be decompacted and recontoured and the area revegetated with appropriate native plants. Individual actions will be subject to NHPA, Section 106 review.

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RES-AS-002	AS	Informal trails	Informal trailing in meadows is common, particularly in Yosemite Valley. Informal trails lead to direct impacts such as soil compaction and vegetation trampling and may have indirect impacts such as changes to hydrology and soil moisture, a decrease in habitat quality, and the introduction of non-native species.	Informal trailing will be removed and restored to natural conditions. Fencing and signage will be used to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Through the use of closure signs, fencing, and/or other natural barriers such as rocks and logs these trails will be better defined and delineated. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants. Installation of fencing, signage, or boardwalks would not occur in areas of designated Wilderness.	Informal trailing in meadows is common, particularly in Yosemite Valley. Informal trails lead to direct impacts such as soil compaction and vegetation trampling and may have indirect impacts such as changes to hydrology and soil moisture, a decrease in habitat quality, and the introduction of non-native species.	(CTA) Informal trailing will be removed and restored to natural conditions. Fencing and signage will be used to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Through the use of closure signs, fencing, and/or other natural barriers such as rocks and logs these trails will be better defined and delineated. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants. Installation of fencing, signage, or boardwalks would not occur in areas of designated Wilderness.	(CTA) Informal trailing will be removed and restored to natural conditions. Fencing and signage will be used to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Through the use of closure signs, fencing, and/or other natural barriers such as rocks and logs these trails will be better defined and delineated. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants. Installation of fencing, signage, or boardwalks would not occur in areas of designated Wilderness.	(CTA) Informal trailing will be removed and restored to natural conditions. Fencing and signage will be used to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Through the use of closure signs, fencing, and/or other natural barriers such as rocks and logs these trails will be better defined and delineated. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants. Installation of fencing, signage, or boardwalks would not occur in areas of designated Wilderness.	(CTA) Informal trailing will be removed and restored to natural conditions. Fencing and signage will be used to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Through the use of closure signs, fencing, and/or other natural barriers such as rocks and logs these trails will be better defined and delineated. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants. Installation of fencing, signage, or boardwalks would not occur in areas of designated Wilderness.	(CTA) Informal trailing will be removed and restored to natural conditions. Fencing and signage will be used to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Through the use of closure signs, fencing, and/or other natural barriers such as rocks and logs these trails will be better defined and delineated. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants. Installation of fencing, signage, or boardwalks would not occur in areas of designated Wilderness.
RES-AS-004	AS	Eroded riverbanks	Heavy use of the riverbanks along some river reaches causes vegetation trampling and soil compaction which leads to riverbank erosion, degraded wildlife habitat and, potentially, river channel widening.	Direct visitor use along river to stable and resilient access points such as sandy beaches and low-angle slopes through delineated trails, signs, campground maps and brochures; establish fencing and signage to protect sensitive areas. Areas susceptible to erosion—steep riverbanks, and high use areas exhibiting vegetation and soil loss from compaction—will be closed and restored. Stabilize eroded riverbanks using bio-engineering techniques such as brush layering of willow cuttings. Revegetate areas of denuded vegetation with appropriate native plants. Protect re-vegetated areas using closure signs, fencing, and/or other natural barriers such as rocks and logs as deterrents. Actions that could impact wilderness character, such as installation of fencing and signage, will not be taken in areas of designated Wilderness.	Heavy use of the riverbanks along some river reaches causes vegetation trampling and soil compaction which leads to riverbank erosion, degraded wildlife habitat and, potentially, river channel widening.	(CTA) Direct visitor use along river to stable and resilient access points such as sandy beaches and low-angle slopes through delineated trails, signs, campground maps and brochures; establish fencing and signage to protect sensitive areas. Areas susceptible to erosion—steep riverbanks, and high use areas exhibiting vegetation and soil loss from compaction—will be closed and restored. Stabilize eroded riverbanks using bio-engineering techniques such as brush layering of willow cuttings. Revegetate areas of denuded vegetation with appropriate native plants. Protect re-vegetated areas using closure signs, fencing, and/or other natural barriers such as rocks and logs as deterrents. Actions that could impact wilderness character, such as installation of fencing and signage, will not be taken in areas of designated Wilderness.	(CTA) Direct visitor use along river to stable and resilient access points such as sandy beaches and low-angle slopes through delineated trails, signs, campground maps and brochures; establish fencing and signage to protect sensitive areas. Areas susceptible to erosion—steep riverbanks, and high use areas exhibiting vegetation and soil loss from compaction—will be closed and restored. Stabilize eroded riverbanks using bio-engineering techniques such as brush layering of willow cuttings. Revegetate areas of denuded vegetation with appropriate native plants. Protect re-vegetated areas using closure signs, fencing, and/or other natural barriers such as rocks and logs as deterrents. 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RES-AS-005	AS	Riparian Protection Zone	The Park has not established an official riparian protection zone to protect water quality and riparian habitat. The lack of protection has led to impacts to aquatic and riparian habitat, soil erosion, and localized impacts to water quality.	Protect riparian zone from new development within 150 feet from the ordinary high water mark. Relocate or remove all campsites at least 100' away from the ordinary high water mark.	There is no established riparian protection zone.	(CTA) Protect riparian zone from new development within 150 feet from the ordinary high water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high water mark.	(CTA) Protect riparian zone from new development within 150 feet from the ordinary high water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high water mark.	(CTA) Protect riparian zone from new development within 150 feet from the ordinary high water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high water mark.	(CTA) Protect riparian zone from new development within 150 feet from the ordinary high water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high water mark.	(CTA) Protect riparian zone from new development within 150 feet from the ordinary high water mark. Relocate or remove all campsites at least 100 feet away from the ordinary high water mark.
RES-AS-007	AS	Revetments: Project Level	Riprap impacts the hydrological ORV by preventing channel migration as well as the Biological ORV by inhibiting the establishment of riparian vegetation.	3,400 feet of riprap will be removed and revegetated with riparian species where needed. An additional 2,300 feet will be removed but replaced with bioconstructed riverbank stabilization (see map for precise locations).	There are 15,589 feet of riprap along the bed and banks of the Merced River. Riprap is considered an impediment to free flow according to the Wild and Scenic Rivers Act, Some of rip-rap is needed to stabilize banks around critical infrastructure.	(CTA) 3,400 feet of riprap will be removed and revegetated with riparian species where needed. An additional 2,300 feet will be removed but replaced with bioconstructed riverbank stabilization (see map for precise locations).	(CTA) 3,400 feet of riprap will be removed and revegetated with riparian species where needed. An additional 2,300 feet will be removed but replaced with bioconstructed riverbank stabilization (see map for precise locations).	(CTA) 3,400 feet of riprap will be removed and revegetated with riparian species where needed. An additional 2,300 feet will be removed but replaced with bioconstructed riverbank stabilization (see map for precise locations).	(CTA) 3,400 feet of riprap will be removed and revegetated with riparian species where needed. An additional 2,300 feet will be removed but replaced with bioconstructed riverbank stabilization (see map for precise locations).	(CTA) 3,400 feet of riprap will be removed and revegetated with riparian species where needed. An additional 2,300 feet will be removed but replaced with bioconstructed riverbank stabilization (see map for precise locations).

Action Code	Segment	Project Name	Issue Statement	Common To All	Alternative 1 ( No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
RES-AS-009	AS	Revetments: Programmatic	Riprap impacts the hydrological ORV by preventing channel migration as well as the Biological ORV by inhibiting the establishment of riparian vegetation.	Remove riprap where possible to restore natural river processes. Replace riprap with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.	There is riprap along the bed and banks of the Merced River, some of which is needed to stabilize banks around critical infrastructure.	(CTA) Remove riprap where possible to restore natural river processes. Replace riprap with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.	(CTA) Remove riprap where possible to restore natural river processes. Replace riprap with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.	(CTA) Remove riprap where possible to restore natural river processes. Replace riprap with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.	(CTA) Remove riprap where possible to restore natural river processes. Replace riprap with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.	(CTA) Remove riprap where possible to restore natural river processes. Replace riprap with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.
RES-AS-010	AS	Large Wood Management	Large wood has been removed from the river due to safety concerns and infrastructure protection for decades, particularly in the areas around the campgrounds and areas where rafting occurs.	Manage large wood according to "Management of Fallen Trees in the Merced River in Yosemite Valley" policy, leaving large wood that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality. In developed areas where standing hazard trees must be removed for safety, rather than cutting and removing these trees, fall them into the river. Add constructed log jams in severely widened river reaches. Large wood would not be manipulated in designated Wilderness areas of the river corridor.	Large wood has been removed from the river due to safety concerns and infrastructure protection for decades, particularly in the areas around the campgrounds and areas where rafting occurs.	(CTA) Manage large wood according to "Management of Fallen Trees in the Merced River in Yosemite Valley" policy, leaving large wood that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality. In developed areas where standing hazard trees must be removed for safety, rather than cutting and removing these trees, fall them into the river. Add constructed log jams in severely widened river reaches. Large wood would not be manipulated in designated Wilderness areas of the river corridor.	(CTA) Manage large wood according to "Management of Fallen Trees in the Merced River in Yosemite Valley" policy, leaving large wood that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality. In developed areas where standing hazard trees must be removed for safety, rather than cutting and removing these trees, fall them into the river. Add constructed log jams in severely widened river reaches. Large wood would not be manipulated in designated Wilderness areas of the river corridor.	(CTA) Manage large wood according to "Management of Fallen Trees in the Merced River in Yosemite Valley" policy, leaving large wood that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality. In developed areas where standing hazard trees must be removed for safety, rather than cutting and removing these trees, fall them into the river. Add constructed log jams in severely widened river reaches. Large wood would not be manipulated in designated Wilderness areas of the river corridor.	(CTA) Manage large wood according to "Management of Fallen Trees in the Merced River in Yosemite Valley" policy, leaving large wood that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality. In developed areas where standing hazard trees must be removed for safety, rather than cutting and removing these trees, fall them into the river. Add constructed log jams in severely widened river reaches. Large wood would not be manipulated in designated Wilderness areas of the river corridor.	(CTA) Manage large wood according to "Management of Fallen Trees in the Merced River in Yosemite Valley" policy, leaving large wood that does not compromise visitor safety or infrastructure. Incorporate large wood into riverbanks to provide structure for highly eroded riverbanks and increase habitat quality. In developed areas where standing hazard trees must be removed for safety, rather than cutting and removing these trees, fall them into the river. Add constructed log jams in severely widened river reaches. Large wood would not be manipulated in designated Wilderness areas of the river corridor.
RES-AS-012	AS	Yosemite Valley: Informal trails	There are 8 miles of informal trails documented in Yosemite Valley meadows. These trails compact soils and fragment meadow habitat. Remove and restore six miles of informal trailing through meadows to natural conditions. Use fencing and signage to direct traffic to less sensitive areas that can accommodate some use without compromising meadow health. Define and delineate accepted trails with closure signs, fencing, and/or other natural barriers such as rocks and logs.	Restore 6 miles of informal trails. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants.	There are 8 miles of informal trails documented in Yosemite Valley meadows.	(CTA) Restore 6 miles of informal trails. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants.	(CTA) Restore 6 miles of informal trails. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants.	(CTA) Restore 6 miles of informal trails. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants.	(CTA) Restore 6 miles of informal trails. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants.	(CTA) Restore 6 miles of informal trails. Remove informal trails by decompacting soils and filling ruts with native soils. Revegetate areas of denuded vegetation with appropriate native plants.
RES-MS-001	AS	Wawona: arch district impacts	Wawona archeological district is subject to impacts from park operations, visitor use, artifact collection, vandalism, and ecological processes.	(CTA) Increased monitoring frequency for affected sites. Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend National Register of Historic Places nomination to reflect district changes and impacts.	(CTA) Increased monitoring frequency for affected sites. Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend National Register of Historic Places nomination to reflect district changes and impacts.	(CTA) Increased monitoring frequency for affected sites. Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend National Register of Historic Places nomination to reflect district changes and impacts.	(CTA) Increased monitoring frequency for affected sites. Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend National Register of Historic Places nomination to reflect district changes and impacts.	(CTA) Increased monitoring frequency for affected sites. Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend National Register of Historic Places nomination to reflect district changes and impacts.	(CTA) Increased monitoring frequency for affected sites. Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend National Register of Historic Places nomination to reflect district changes and impacts.	(CTA) Increased monitoring frequency for affected sites. Increase management protection designed to counteract or minimize impacts, crafted to individual site specifications. At the districtwide level, amend National Register of Historic Places nomination to reflect district changes and impacts.

## **APPENDIX L**

### **DETERMINATION OF EXTENT NECESSARY**



## APPENDIX L

### DETERMINATION OF THE EXTENT NECESSARY FOR COMMERCIAL SERVICES IN THE WILDERNESS SEGMENTS OF THE MERCED WILD AND SCENIC RIVER CORRIDOR

#### PART 1: INTRODUCTION

The vast majority of Yosemite National Park (95%) was designated as federally protected wilderness by the California Wilderness Act of 1984.<sup>1</sup> Congress delegated management responsibility for Yosemite Wilderness to the National Park Service (NPS). In furtherance of its wilderness management responsibilities, the NPS has adopted a trailhead quota system to limit overnight visitation, implemented an extensive educational program to teach visitors how to minimize their impacts, promulgated a variety of specific regulations that mandate low impact practices, and instituted numerous monitoring programs to assess wilderness character and track potential threats to that character.

The National Park Service has not yet completed an Extent Necessary Determination for commercial services for Yosemite's entire designated wilderness. The need for this type of specialized finding has only recently been articulated, stemming from a 2004 decision by the U.S. Court of the Appeals for the Ninth Circuit in the case *High Sierra Hikers Association v. Blackwell*.<sup>2</sup> In the *Blackwell* decision, the Ninth Circuit ruled that wilderness managing agencies must complete a specialized finding of necessity prior to authorizing commercial services in wilderness. This finding must be made after considering the extent to which commercial services are necessary to achieve the purposes for which the affected wilderness area was set aside. Congress directed that Yosemite's wilderness be set aside for recreational, scenic, scientific, educational, conservation, and historical use purposes. This document evaluates the necessity for commercial services for designated wilderness portions of the Merced River corridor in light of these purposes.

The most appropriate framework for completing an assessment of an Extent Necessary Determination for commercial services in wilderness is in the park's wilderness stewardship plan, where commercial services will be addressed comprehensively for Yosemite's entire wilderness. Yosemite National Park has appropriated funding for updating its Wilderness Stewardship Plan, and has begun the initial steps in the planning process. The plan, however, will not be ready for public review for several more years. Rather than await the development of a new Wilderness Stewardship Plan, the park has elected to analyze commercial services in the wilderness portions of the Merced Wild and Scenic River corridor at this time and provide the public with an opportunity to comment.

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<sup>1</sup> California Wilderness Act, Public Law No. 98-425 (1984)

<sup>2</sup> See, e.g., *High Sierra Hikers Association v. Blackwell*, 390 F.3d 630 (9<sup>th</sup> Cir. 2004); *High Sierra Hikers Association v. Weingardt*, 521 F. Supp. 2d 1065 (2007).

## **PART 2: PURPOSE OF THIS EXTENT NECESSARY DETERMINATION AND RELATIONSHIP TO OTHER PLANS**

The purpose of this document is to determine limits on commercial services in the wilderness sections of the Merced River Corridor in accordance with the requirements of the Wilderness Act *and* NPS wilderness management policies. The limits described in this document apply only to the wilderness segments of the Merced River corridor.

As noted above, the NPS is in the early stages of updating the park's Wilderness Stewardship Plan. Limits adopted in this Extent Necessary Determination will be revisited as part of the planning process for the Wilderness Stewardship Plan, which will determine the extent of commercial services necessary throughout all of Yosemite's designated Wilderness. There will be many opportunities for public involvement in the development of the Wilderness Stewardship Plan, including the ability to provide additional input on the amount of commercial services that should be authorized.

This Extent Necessary Determination is neither a formal element nor a required component of the Wild and Scenic Rivers Act as addressed in the Merced Comprehensive River Management Plan.

Under the Wild and Scenic Rivers Act, the NPS must adopt specific limits on use within the river corridor to ensure that the kinds and amounts of visitor use protect and enhance the river's outstandingly remarkable values, free flowing condition and water quality. The MRP's capacity determinations, then, represent the maximum amount of use that can be allowed without degrading river values. The user capacities that were established in the MRP planning process were incorporated into this Extent Necessary Determination. In sections 7 and 8 below, this document analyzes those capacities in accordance with the requirements of Section 4(d) of the Wilderness Act to determine the extent to which any portion of the MRP's numeric use limits should be allocated to commercial service users. This Extent Necessary Determination therefore tiers from the capacity determinations in the MRP.

## **PART 3: LEGAL FRAMEWORK FOR EVALUATING COMMERCIAL SERVICES IN WILDERNESS**

### **A. The Wilderness Act**

The Wilderness Act was passed in 1964 to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness."<sup>3</sup> Section 4(c) of the Wilderness Act explicitly bars "commercial enterprises within designated wilderness areas."<sup>4</sup> An exception to this ban, subject to limitations, is provided for commercial services such as guides and outfitters in section 4 (d) 6, which states that "commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other

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<sup>3</sup> Wilderness Act, 16 USC 1131 (a)

<sup>4</sup> Wilderness Act, 16 USC 1133 (c)

wilderness purposes of the areas.”<sup>5</sup> “Wilderness purposes” are defined in section 4 (b) of the Act as “recreational, scenic, scientific, educational, conservation, and historical use.”<sup>6</sup>

The National Park Service has not issued regulations or formal policy guidance outlining the process for authorizing commercial services under Section 4(d) of the Act. However, the U.S. Court of Appeals for the Ninth Circuit has issued several decisions interpreting the restrictions on commercial activities found in Sections 4(c) and (d) of the Act. These decisions have informed the analysis in this Extent Necessary Determination.

In 2003, the Ninth Circuit, in *The Wilderness Society v. U.S. Fish & Wildlife Service*,<sup>7</sup> examined the overall structure of the Act and found that the Act’s broad mandate to protect wilderness areas was furthered by the prohibition provision found in Section 4(c), which among other things, prohibits commercial enterprises in wilderness. That prohibition, however, is qualified by the introductory language of Section 4(c) which states, “*Except as specifically provided for* in this [Act] . . . there shall be no commercial enterprise” within any wilderness area. (Emphasis added.) The exceptions to Section 4(c)’s prohibitions are found in Section 4(d), which is entitled “Special provisions.” Of relevance here is the exception allowing for commercial services. The commercial services exception is limited in scope. Because of the Act’s structure, in which there is a broad prohibition on commercial enterprise in Section 4(c) followed by a list of “special provisions” in Section 4(d), the Court concluded that the exceptions found in Section 4(d) are most properly read as a series of limited and express exceptions to the general prohibition found in Section 4(c) on commercial enterprises in wilderness.<sup>7</sup>

In 2004, the Ninth Circuit issued an opinion, *High Sierra Hikers Assn. v. Blackwell*, interpreting the commercial services exception found in Section 4(d)(6) of the Act. The Court examined the specific language of Section 4(d)(6), and in particular the language stating that commercial services may only be authorized “to the extent necessary,” as well as relationship between Section 4(d)(6) and other provisions of the Wilderness Act. According to the Court, the phrase “to the extent necessary” imposed a requirement on wilderness managing agencies to make a “specialized” finding of necessity before authorizing commercial services in wilderness. In this specialized finding, the agency must “show that the number of permits [or other authorizations] granted was no more than was necessary to achieve the goals of the Act.” Although it determined that a specialized finding is required, the Court recognized that the Wilderness Act is “framed in general terms and does not specify any particular form or content” for the specialized finding. Moreover, the Court recognized that wilderness managing agencies are charged with diverse and sometimes conflicting mandates under the Act. Agencies are obligated to protect and preserve wilderness areas, but the Act also embraces competing directives such as those related to the provision of opportunities for public recreation and the discretion to take actions to manage fire and insect risks.<sup>8</sup>

This Extent Necessary Determination follows the direction provided by these Court opinions. In the sections that follow, we identify the types of “activities which are proper for realizing recreational and other wilderness purposes” and then determine the numeric amount of commercial services that are

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<sup>5</sup> Wilderness Act, 16 USC 1133 (d) (5)

<sup>6</sup> Wilderness Act, 16 USC 1133 (b)

<sup>7</sup> *The Wilderness Society v. U.S. Fish & Wildlife Service*, 252 F.3d 1051, 1062 (en banc) (2003)

<sup>8</sup> *High Sierra Hikers Assn. v. Blackwell*, 390 F.3d 630 (9<sup>th</sup> Cir. 2004)

necessary to realize these purposes, ensuring that the number authorized is no more than necessary so that wilderness character will be preserved.

## **B. NPS Wilderness Management Policies**

Commercial services must be consistent with the application of the minimum requirement concept and with the objectives of the park's Wilderness Management Plan.<sup>9</sup> See Section 9 of this document for the application of the minimum requirement concept for commercial allocation.

## **C. Yosemite Wilderness Management Plan**

The Yosemite Wilderness Management Plan states that commercial packers "...may be restricted to designated park areas."<sup>10</sup>

## **PART 4: USER CAPACITY IN WILDERNESS**

In the Yosemite Wilderness, wilderness character is preserved in part through the use of the trailhead quota system, which limits the amount overnight visitation through the use of a wilderness permit system. In order to preserve wilderness character, NPS must ensure that natural resources are protected from damage that can result from overuse, and that outstanding opportunities for solitude are preserved.

The Yosemite trailhead quota system was developed in the 1970s, prior to wilderness designation.<sup>11</sup> The backcountry area of the park was divided into travel zones. For each zone a capacity was set based on the number of acres and miles of trails and desired sociological densities for campsites and trails. The capacities were then adjusted to protect ecological resources. For example, capacities were adjusted in zones with ecosystems that were rare or vulnerable (such as those with subalpine meadows), or that exhibit fragility or limited resilience following impacts (such as those with alpine meadows). Zone capacities have been adjusted periodically to reflect new or changed scientific findings regarding ecosystem health and the effect of patterns of visitor use on resources.

In concert with these zone capacities, the NPS has implemented a trailhead quota system. This type of system requires beginning a trip at a certain trailhead on a certain day, but otherwise does not generally restrict travel plans. Visitor travel patterns were studied to determine the relationship between the various trailheads and the travel zones.<sup>12</sup> By studying wilderness visitation travel patterns, managers were able to determine the percentage of visitors to each zone that are attributable to each trailhead. By limiting the number of individuals who may enter the wilderness from a given trailhead

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<sup>9</sup> NPS Management Policies 2006 6.4.4.

<sup>10</sup> National Park Service, Wilderness Management Plan, 1989, pg. 21

<sup>11</sup> van Wagtenonk, J. W. 1979. A conceptual backcountry carrying capacity model. Proc. 1st. Conf. Sci. Res. in the nat'l. Parks. USDI, Nat'l. Park Serv. Trans. and Proc. Series 5:1033-1038.

<sup>12</sup> van Wagtenonk, J.W., and J. M. Benedict. 1980. Wilderness permit compliance and validity. J. Forestry 78(1): 399-401; van Wagtenonk, J.W., and P. R. Coho. 1986. Trailhead quotas: rationing use to keep wilderness wild. J. Forestry 84(11): 22-24.

on a given day, managers limit the number of visitors to each zone such that the wilderness character of the zone, including both the physical resources and the outstanding opportunities for solitude are maintained in accordance with law.

As part of the Merced River Plan, the NPS reevaluated the wilderness zone capacities within the Merced River Corridor in light of the Wild and Scenic Rivers' Act mandate to protect and enhance Outstandingly Remarkable Values and the river's free-flowing condition. The zone capacities adopted for the river corridor guided the Extent Necessary Determination process. For six of the eight zones that include the Merced River corridor, the zone is much larger than the corridor. This extent necessary determination is for the full geographic extent of all eight zones rather than just the corridor. In addition to the use limits set by the trailhead quota system additional limits that relate to wilderness will be in place under the Merced Wild and Scenic River Plan. For example, a capacity on grazing nights for pack stock is being established for the meadow near the Merced Lake Ranger Station.

## **PART 5: DEFINITIONS**

### **A. Definition of Proper Activities**

Section 4 (d) (6) only allows commercial services which are "proper for realizing the recreational or other wilderness purposes of the areas." Not all activities are proper or allowable in wilderness areas. Section 4(c) of the Wilderness Act prohibits public use of motor vehicles, other forms of mechanical transport, motorized equipment, and landing of aircraft.<sup>13</sup> The 2006 Management Policies provide additional guidance on the types of activities that are proper in park wilderness areas. NPS policy states that recreational uses in wilderness will be of a nature that:

- Enables the areas to retain their primeval character and influence;
- Protects and preserves natural conditions;
- Leaves the imprint of man's work substantially unnoticeable;
- Provides outstanding opportunities for solitude or primitive and unconfined types of recreation; and
- Preserves wilderness in an unimpaired condition<sup>14</sup>.

These restrictions apply equally to commercial and noncommercial public use. In the Yosemite Wilderness, proper activities are those traditionally associated with wilderness recreation, including hiking, backpacking, stock use, rock climbing, photography, nature study, and others. Improper (and illegal) activities include snowmobiling, mountain biking, skateboarding, and others. For a commercial service to be considered, it must first be related to an activity that is proper in wilderness. Therefore, the only commercial services considered in this document are those related to the types of activities found to be proper in Yosemite wilderness.

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<sup>13</sup> 16 USC 1133 (c).

<sup>14</sup> NPS Management Policies 2006, 6.4.3.

The Wilderness Act directs that wilderness areas be administered “so as to provide. . .for the gathering and dissemination of information regarding their use and enjoyment as wilderness”<sup>15</sup> The making of films in wilderness is considered proper for realizing the educational and scenic purposes.

## B. Definition of Commercial Services

Before the National Park Service can determine the types of commercial services that are necessary to further wilderness purposes, we must first determine which services are commercial in nature and which are not. The Wilderness Act does not define the term “commercial service.” When Congress has failed to include definitions of important terms in a statute, agencies may rely on commonly accepted definitions. The word “commercial” is commonly defined as (1) “[o]f or relating to commerce,” *i.e.*, “[t]he buying and selling of goods, esp. on a large scale: business,” (2) “[e]ngaged in commerce,” (3) “[i]nvolved in work designed or planned for the mass market,” or (4) [h]aving profit as a primary aim.”<sup>16</sup> The word “service” is commonly defined as, “the organized system of apparatus, appliances, employees, etc., for supplying some accommodation required by the public” or “the performance of any duties or work for another; helpful or professional activity.”<sup>17</sup> Activities that are necessary and proper for realizing wilderness purposes will be evaluated to determine whether they reflect consistent, commonly understood usage of the terms “commercial” and “services.”

In addition, our determination as to what constitutes a “commercial service” is guided by an analysis of the primary purpose and effect of each service. This further layer of analysis, focused on purpose and effect, is supported by judicial precedent.<sup>18</sup> While some services are conducted for more than one purpose and may have more than one effect, the focus of our analysis is on ascertaining the primary reason for the service. Incidental or subsidiary purposes and effects do not dictate that a service be categorized as commercial.

**For purposes of this document, a commercial service is one that relates to or is connected with commerce wherein work is performed for another person or entity, if the primary purpose is the experience of wilderness through support provided for a fee or charge and if the primary effect is that the wilderness experience is guided and shaped through the use of support services provided for a fee or charge.**

The form of the organization providing the service is also not dispositive of whether the organization is offering a commercial service, for example whether it is a non-profit or not-for-profit. Rather, the definitions above, including an analysis of the activity’s purpose and effect, will guide a determination of whether a service is commercial or not.

Commercial services may be authorized under a number of different legal authorities, using a number of different instruments. Of relevance to designated wilderness areas within Yosemite National park are concession contracts, commercial use authorizations, and special use permits.

<sup>15</sup> Wilderness Act, (16 USC 1131 (a)).

<sup>16</sup> Webster’s II New College Dictionary 225 (1995); *accord* Merriam-Webster’s Collegiate Dictionary 230 (2000). *See Wilderness Society v. U.S. Fish and Wildlife Service*, 353 F.3d. 1051, 1061 (9<sup>th</sup> Cir. 2003)

<sup>17</sup> [www.dictionary.com](http://www.dictionary.com).

<sup>18</sup> *Wilderness Society v. U.S. Fish and Wildlife Service*, 353 F.3d. 1051, 1061 (9<sup>th</sup> Cir. 2003).

## **1. *Authorization Mechanisms for Commercial Services***

### **a. Concessions Contracts and Commercial Use Authorizations:**

Services authorized under concessions contracts and commercial use authorizations are considered commercial services because the entities holding these authorizations are businesses engaged in commerce, they provide a service to the public, members of the public who use these services experience Yosemite wilderness directly as a result of this commercial support, and employees of the concessioner and CUA holder direct and guide the wilderness experience of the trip participants. CUAs holders who lead either stock or hiking trips (hiking trips include those that focus on fishing, photography, Nordic skiing, and other appropriate activities which do not involve stock transport or technical climbing) are considered providers of commercial services, as is the primary park concessioner, which leads stock, hiking, and climbing trips in wilderness.

### **b. Special Use Permits:**

Special Use Permits are used to authorize a wide range of activities, many of which are not commercial. Because Special Use Permits are issued on a case by case basis, it is not possible to evaluate all of the different activities that might be requested in a special use permit in advance; however, commercial filming permits (one type of Special Use Permit) are discussed below. When a request for another type of Special Use Permit in wilderness is received, it will be evaluated in accordance with the criteria above to determine whether the activity constitutes a commercial service. If it does, a permit will only be authorized in accordance with the procedures set out below in Sections 8.

## **2. *Application of the Purpose and Effect Analysis***

For the majority of traditional wilderness outfitting and guide services the determination of commerciality is straightforward. The commerciality of some uses is not as clear, however, and those uses are analyzed here.

### **a. Scientific Research:**

Scientific research performed by faculty, postdoctoral fellows, or students enrolled in degree-granting programs in accredited colleges and universities or holding appointments with governmental agencies or scientific research institutions, even when accompanied by pack stock support, will typically not be considered commercial. Research trips using pack stock support would normally not be classified as a commercial service trip because the primary purpose and effect of the trip is the enhancement of scientific understanding of park resources, not commercial interests. The NPS will review requests for scientific research permits that involve the support of commercial outfitters to determine whether the trip is commercial. In the event that a research trip is categorized as a commercial service, it will be allowed in accordance with the procedures set out below in Sections 8.<sup>19</sup>

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<sup>19</sup> Some scientific research could involve a commercial component if it contained an element of “bioprospecting.” Any such proposals will be reviewed for legality under the Wilderness Act and commerciality under the guidelines noted above.

## **b. Commercial Filming and Photography:**

The NPS allows commercial filming and photography in national parks provided that there would not be a likelihood of resource damage, an unreasonable disruption of the public's use and enjoyment of the site, or a health or safety risk to the public.<sup>20</sup> Filming involves movement or motion of the subject whereas photography does not. The NPS Management Policies define "commercial filming" as "filming that involves the digital or film recording of a visual image or sound recording by a person, business, or other entity for a market audience." All commercial filming is subject to permitting requirements, and is limited to projects that are necessary or proper for providing educational information about wilderness uses, resources or values, or necessary for other wilderness purposes. Still photography is only subject to permitting requirements if it takes place in areas not open to the public, involves the use of models or props that are not part of the location's existing setting, or requires NPS oversight. Based on the NPS policy cited above, all commercial filming and photography will be treated as a commercial service.

## **c. Trips by Educational Institutions:**

Each year, the park receives requests for wilderness trips by student groups from accredited educational institutions which are conducting classes for course credit. These institutions range from elementary, middle and high schools to colleges and universities. The goal of these trips is to provide environmental education to students and to foster self-reliance and other qualities. In some cases, employees of the educational institution guide the trip. In others, the school retains the services of an institution with expertise in environmental education. NatureBridge, a park partner whose mission is environmental education, leads many trips of this type (A small percentage of NatureBridge's trips are not for academic credit and are considered commercial). Trips by accredited academic institutions which give course credit for completion, even if accompanied by Yosemite Institute or a similar organization, are not considered commercial services for the purposes of this Extent Necessary Determination. The primary purpose and effect of these trips is fulfilling academic goals for the students involved. The students' experience is guided and shaped by the institution's academic goals. Support services from environmental education organizations like NatureBridge do not change the essential character of the trip, which is academic not commercial.

# **C. Definition of Wilderness Purposes**

## **1. Recreation**

All visitors to the Yosemite Wilderness help to realize the recreational purpose. The recreational purpose is realized when people are engaged in proper activities in wilderness. Those activities are described in Section 5.A above. Hiking, backpacking, horseback riding, fishing, climbing, nature study, and mountaineering are just a few examples of the many ways that visitors help to realize this purpose. Yosemite National Park does not allocate capacity to particular wilderness recreational activities.<sup>21</sup>

<sup>20</sup> U.S.C. §460l-6d

<sup>21</sup> This approach is reaffirmed by a recent district court ruling which stated: "...neither fishing nor any other particular activity is endorsed by the Wilderness Act, nor is the enhancement of any particular recreational potential a necessary duty of wilderness area management." *High Sierra Hikers Assn. v. U.S. Forest Service*, 436 F.Supp.2d 1117, 1144 (E.D. Cal. 2006).



## **2. Education**

While many wilderness visitors are engaged in some type of informal, self-directed education, formal education is also necessary to realize the educational purpose.

Examples of formal education that realize the educational purpose of wilderness include, but are not limited to the following:

“How to” education on such topics as:

- Equipment selection
- Navigation
- Wilderness first aid
- Travel and camping skills

More advanced “skills” training on such topics as:

- Rock climbing
- Mountaineering
- Backcountry skiing

Coursework on wilderness values, ethics or philosophy including:

- Natural history
- Human or cultural history
- Wilderness values
- Environmental social or political history
- Environmental philosophy

Coursework on scientific aspects of wilderness, such as:

- Biology
- Geology
- Zoology
- Fire ecology

Programs specifically designed to teach residents of urban areas, particularly youth, wilderness skills, including:

- Self reliance
- Survival
- Independence
- Physical fitness and agility
- Mental toughness
- Problem-solving
- Adaptability

Making of educational films about wilderness, including but not limited to those about wilderness:<sup>22</sup>

- Wilderness values
- Natural history
- Human or cultural history
- Famous wilderness defenders such as John Muir
- Endangered species preservation
- Instructional films covering wilderness skills and techniques

Exception:

- Leave No Trace training is considered a fundamental prerequisite for all wilderness visitors and as such will *not* be considered formal education.

### 3. *Scenic*

Wilderness possesses a particular type of scenery-natural and untrammeled. The scenic purpose is realized when visitors observe the natural landscape of wilderness. It is also realized when people take photographs of scenery and share them with others outside of the wilderness. As with the educational purpose, however, there is a more formal appreciation of scenery that is enjoyed by photographers and other artists. Commercial services provide necessary support for this purpose if they offer photography, painting, or even writing workshops that focus on appreciating and interpreting the scenery. Commercial filming, videography, audiography, and photography also realize the scenic purpose if they focus on wilderness scenery and soundscape.

### 4. *Conservation*

Conservation means actions that help to maintain the wilderness in a largely natural and untrammeled state, with native biodiversity intact and natural processes uninterrupted.

Examples of activities in wilderness that help to realize the conservation purpose include, but are not limited to:

- Ecological restoration projects
- Trail building and maintenance
- Species preservation activities
- Eradication or removal of non-native invasive species

Realizing the conservation purpose is primarily an agency responsibility. Occasionally a visitor group conducts a “service trip” that includes conservation work. In Yosemite, however, these groups are not able to work independently of NPS control and supervision. They are designated as volunteers, and are thus agents of the National Park Service. This purpose is realized by the agency, not by commercial

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<sup>22</sup> Films focused on displaying scenic beauty rather than providing education on a topic may more properly be considered to fulfill the “scenic” purpose described below at Section 5.B.3.

services. If the primary purpose of the service trip is to construct, implement or maintain a conservation project, then the purpose and effect is non-commercial.

## **5. *Historic***

“Historic uses” are defined as those uses which emphasize the wild, untrammeled, and natural character of the land in its historic state. Visitors help to realize the historic purpose when they encounter the land as did those of earlier historical periods. The historic purpose is realized by maintaining the wilderness character of the land, by primitive recreation in the wilderness, by the provision of opportunities for solitude, and by enjoying the scenic wonders of the natural and untrammeled landscape. The realization of this purpose is consistent with the realization of the conservation and recreational purposes.

The courts have directly addressed the meaning of “historic uses” as used in the Wilderness Act, and have uniformly construed “historic use” to mean use of the primeval or ancient wilderness in its natural state. The U.S. Court of Appeals for the 11th Circuit found that “the only reasonable reading of “historical use” in the Wilderness Act refers to experiencing the natural, rather than man made, features.”<sup>23</sup> This decision was followed by the district court in *Olympic Park v. Mainella*, which held that:

[t]he Park Service references the historic pattern of shelter construction and recreational use in concluding that the “setting, association, and feeling are significant aspects of historic use within the park” (AR 416-17), but while this may be true, this type of usage is in the past and a new value has been placed on the land by the creation of the Olympic Wilderness....a different “feeling” of wilderness is sought to be preserved for future generations to enjoy, a place “where the earth and its community of life are untrammeled by man” and which retains “its primitive character and influence.”<sup>24</sup>

Thus, “historic use” refers to preserving the wilderness character of the land so that each visitor may encounter it in its historic state, as undeveloped as it was when modern humans first experienced it. No commercial services are necessary for the realization of the historical purpose because its realization is congruent with the realization of the conservation purpose.

## **6. *Scientific***

The natural and untrammeled qualities of wilderness make an area valuable to science. Realizing the scientific purpose means allowing scientific research and monitoring to take place in wilderness. Unlike conservation activities, scientific activities fall on a spectrum from administrative to independent: Some are conducted by the agency, some are conducted by academics but sponsored or overseen by the agency, and some are conducted by independent academics or graduate students. Research conducted by or for the NPS is considered administrative, not commercial. On rare occasions an independent researcher might require commercial services to pack in supplies. However

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<sup>23</sup> *Wilderness Watch v. Mainella*, 2004, need correct cite format, followed by *Olympic Park Associates v. Mainella*, 2005 WL 1871114 (D. Wash. 2005)

<sup>24</sup> *Olympic Park Associates v. Mainella*, 2005 WL 1871114 (D. Wash. 2005)

as discussed above in Section 5, the incidental use of pack services to support a research trip typically would not convert a research trip into a commercial service.

In the Yosemite Wilderness, research is reviewed by an interdisciplinary permit committee and limited though a process articulated in *An Interagency Framework to Evaluate Proposals for Scientific Activities in Wilderness*.<sup>25</sup> This framework, including the application of the minimum requirement concept, provides methods to quantify the impacts and benefits of research, compare costs and benefits, and prioritize research proposals.

## PART 6: EXTENT NECESSARY DETERMINATION

This section describes the thresholds and methods used to determine limits on commercial services in the wilderness portions of the Merced River corridor. As noted above, no commercial services are needed for the realization of the historic, scientific, or conservation purposes. All proposed commercial trips in wilderness will be assessed to see which purposes they fulfill (see section on the application process, below).

### A. Overnight Use

The wilderness portions of the Merced River corridor are overlaid with eight wilderness management zones. Each zone has an established capacity and trailhead limits are enforced. The extent necessary determination for overnight trips analyzes use in each zone by month.

#### 1. Recreational Purpose

Under the Wilderness Act, the NPS can only authorize commercial services in wilderness if they are necessary to realize wilderness purposes. Therefore it is important to understand the amount of non-commercial use that is occurring in relation to established capacities. If a wilderness zone is substantially full with noncommercial visitors, then commercial visitors are not needed to realize the recreational purpose. To determine whether an area is “substantially full,” the following method is used:

Each zone is accessed by a number of trailheads, each with a daily quota for overnight use (see capacity discussion above in Part 4). For each zone, permit records for all trailheads that provide more than 10% of the overnight visitors to that zone are tallied (minus permits for commercial groups) and compared to the trailhead quotas. The number of days per month that those trailhead quotas are at least 90% full is tallied. Those days are considered “full.” 90% was chosen instead of 100% because visitors are frequently turned away before 100% of the quota is reached—for example, if only one spot is left, groups of two or greater will be turned away. On many days reserved permits are cancelled, or groups with a reservation arrive with a smaller group than planned. When this happens late in the day, utilization is slightly less than the quota even though many groups may have been turned away.

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<sup>25</sup> See Landres, P., Fincher, M., Sharman, L., et al, *An Interagency Framework to Evaluate Proposals for Scientific Activities in Wilderness*, 2009 at [wilderness.net/toolboxes](http://wilderness.net/toolboxes).

This analysis is done by month, using a five year average of wilderness permit data from 2005-2009. If a zone is “full” more than 66% of the days in a month, that zone is considered substantially full, and will be considered a “restricted” zone. Those zones where the trailheads serving the zone are full 33% to 65% of the time are “weekend restricted” zones. Typically the full days fall on weekend nights, with Fridays and Saturdays the most likely to be substantially full.

Webster’s Dictionary defines “realized” as “to bring into concrete existence.” It is not necessary that a zone be filled to capacity in order for the recreational purpose of that zone to be realized. However, “realization” implies a level of “concrete” use beyond the minimum. Many zones are popular destinations with great demand for access from both the public and commercial outfitters. A zone threshold of 66% for “realization” of the recreational purpose means that all wilderness permits for that zone are issued 4.6 days per week throughout the month. This means that every weekend and holiday as well as many weekdays is filled to capacity for that zone. Additionally, in many popular zones even those days on which utilization falls below 90% it often exceeds 80%. This means that the overall percentage of a quota utilized for a given month may be significantly higher than the percentage of “full” days. The level at which a purpose is realized necessarily entails an exercise of management judgment. This definition of “realization” balances the competing factors of access for commercial recreational groups against the overall preference expressed in the Wilderness Act for noncommercial recreational visitation.

A zone threshold of 33% to 65% for a “weekend restricted” zone means that this zone is filled to capacity between 10 and 19 days per month. This means that every weekend and holiday is filled to capacity for that zone. Noncommercial public recreational demand is dramatically increased on weekends. The “weekend restricted” designation maintains commercial recreational access to desirable areas by permitting it on weekdays, when it helps realize the recreational purpose, while maximizing noncommercial recreational access on weekends.

The results of the overnight commercial recreational capacity analysis are shown on map 1. Overnight commercial groups will be allowed to travel through restricted or weekend restricted zones as long they spend the night outside of such zones.

## ***2. Educational Purpose***

The educational purpose is considered realized when there are opportunities for both informal and formal education taking place in the wilderness. Informal education is self-directed learning available to all wilderness visitors. The realization of the “informal” component of the educational purpose can be considered as numerically congruent with the realization of the recreational purpose: All those who are recreating are in some way engaged in informal education. Directed, formal education is also a proper activity in wilderness and also realizes the educational purpose. Formal education presented by a qualified instructor can promote a deeper, more comprehensive understanding of wilderness related subjects. An allocation of 10% of capacity is necessary to ensure that there is sufficient opportunity for formal education and classes, including the making of educational films. Trips that realize the educational purpose also, by definition, also realize the recreational purpose and therefore educational trips in excess of 10% of capacity would be allowed in non-restricted zones to help realize the recreational purpose.

The percent of capacity allocated to formal education is small for a number of reasons:

- The educational purpose is largely being realized through informal education
- NPS Management Policies directs that “. . . the service will, to the extent practicable, afford visitors ample opportunity for inspiration, appreciation, and enjoyment through their own personalized experiences-without the formality of program or structure.”<sup>26</sup>
- Commercial educational use in restricted and weekend-restricted zones will displace non commercial use. Under the overall structure of the Wilderness Act, denial of access to non commercial visitors in favor of commercial visitors should be minimized.

Classes offered by accredited schools for which students receive academic credit are not considered commercial and are not restricted by this allocation (see section 5).

For restricted zones, and weekend restricted zones on weekends, formal education conducted by noncommercial entities such as the NPS, and accredited schools, colleges, and universities conducting classes for academic credit is also realizing the educational purpose, and will first be subtracted from that 10% of capacity. The remaining allocation, if any, will be available for commercial formal education in order to realize the educational purpose.

### ***3. Scenic Purpose***

All visitors are engaging in informal appreciation of wilderness scenery, as are individuals located outside of wilderness who are looking in from a road or other developed area. Formal appreciation of wilderness scenery, such as art and photography workshops, can foster a more structured understanding of scenery and is also necessary to realize a purpose of the Wilderness Act. An allocation of 5 % of capacity is necessary to ensure that there is sufficient opportunity for formal appreciation of wilderness scenery, including the making of films that focus on wilderness scenery. Trips that realize the Scenic purpose also, by definition, also realize the recreational purpose and therefore Scenic trips in excess of 5% of capacity would be allowed in non-restricted zones to help realize the recreational purpose.

The percent of capacity allocated to formal appreciation of scenery is small for a number of reasons:

- The scenic purpose is largely being realized through informal appreciation, both inside and outside of wilderness
- Policy guidance, noted above, that directs that non-formal opportunities be “ample.”
- Commercial scenic use in restricted and weekend-restricted zones will displace non commercial use. Under the overall structure of the Wilderness Act, denial of access to non commercial visitors in favor of commercial visitors should be minimized.

Art and photography classes offered by accredited schools for course credit are not considered commercial and are not restricted by this allocation (see section 5).

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<sup>26</sup> NPS Management Policies 2006 8.2

## **B. Day Use**

The only significant day use in the Merced River Corridor is in the Little Yosemite Valley area. Nearly all of this day use is on the one mile section of the John Muir Trail from the top of Nevada Fall to where the trail leaves the corridor near the designated camping area. An analysis of commercial use from 2005-2009 shows that all commercial day use in the corridor was limited to hikes to Half Dome. That use has already been limited through an Extent Necessary Determination for the Half Dome Stewardship Plan. That plan limits commercial day use to a maximum of 30 people per day for trips that realize the educational purpose and 15 people per day for trips that realize the scenic purpose. Those limits are appropriate for realizing the educational scenic purposes of wilderness in the Merced River corridor while protecting other wilderness values.

## **C. High Sierra Camps**

In 1984, when Congress designated the Yosemite Wilderness, it allowed the continuation of the High Sierra Camps as a non-conforming use and designated the immediate areas of the camps as potential wilderness additions. The only High Sierra Camp in the Merced River corridor is Merced Lake.

The camps are a commercial operation and offer seasonal, rustic accommodations. Under the preferred alternative of the Draft Merced River Plan the Merced Lake High Sierra Camp will provide 42 guest beds, offer full meal service to guests, and sell sundry items to both camp guests and other visitors. It is typically open from early July to early September. The National Park Service, in conjunction with the concessioner, conducts commercial educational “loop trips” to the High Sierra Camps and provides formal interpretative educational programs to both High Sierra Camp guests and backpackers from nearby campgrounds.

The Merced Lake High Sierra Camp is a substantial commercial presence and affects the wilderness experience of visitors in the area, as do the visitors, employees, support personnel, and supply trips going to and from the camp. The nature of the camp, with a nonconforming level of development and services, means that the Merced Lake zone is highly commercialized compared to those zones that have only more traditional, conforming outfitter and guide services. To prevent further commercialization of this area, the Merced Lake zone will be managed as “restricted” during July and August when the camp is open, and the commercial formal education provided by the NPS-concession loop trips will be subtracted from the overnight use allocations for such use, as well as noncommercial educational use.

## **D. Disabled Access**

NPS Management Policies states that the agency must “make available equal opportunities for people with disabilities in all programs and activities.”<sup>27</sup> For some people who are mobility impaired, commercial stock services may provide the only reasonable way to access the wilderness. This Extent Necessary Determination only prohibits some types of commercial use in two wilderness management

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<sup>27</sup> NPS Management Policies 6.4.10

zones (there are 53 such zones in the entire wilderness; 8 in the Merced River corridor) for a part of the use season. Like persons without mobility impairments, mobility impaired visitors may not be able to gain access to their preferred destination as part of a commercial trip during the restricted period. However, Yosemite has many other areas where visitors can take stock-assisted trips. As such, there are “equal opportunities” for mobility impaired individuals to use commercial stock trips to visit the Yosemite Wilderness.

## E. Other Commercial Use Limits

In order to honor the clearly expressed legislative intent in the Wilderness Act to limit commercialization of wilderness, and the legislative mandate to permit commercial use only to the extent necessary to realize the wilderness purposes, the following policies will be implemented:

- In the Yosemite Wilderness, off-trail areas are managed to provide outstanding opportunities to enjoy solitude as well as a more pristine natural environment: Group size is limited to eight instead of fifteen to provide enhanced opportunities for solitude, and stock use is generally prohibited to prevent stock impacts in areas without the protection of properly designed and hardened trails. Off-trail areas in the Merced River Corridor zones of the Yosemite Wilderness will be commercial-free areas. No commercial use will be allowed more than ¼ mile from a maintained trail, authorized cross country stock route, or public access road (as shown on the latest version of U.S.G.S. topographic maps.)
- Overnight commercial trips are limited to two per zone per night. There are three reasons for this limit. First, this limit is necessary to protect areas from impacts due to displacement from restricted and weekend restricted zones. Such displacement, if not properly managed, could result in undesirable physical impacts from grazing or from the creation of new campsites large enough to accommodate large commercial groups of 12-15 people, as well as the social impacts of increased numbers of large groups. Second, this limit will help to prevent “harmful spikes in use”<sup>28</sup> and protect the wilderness character of areas to which commercial use may be displaced under the operation of this plan.<sup>29</sup> If three or more large commercial groups are all displaced to the most desirable unrestricted zone, it could create crowding that detracts from the wilderness experience of noncommercial visitors sharing a zone with such groups.<sup>30</sup> A limit of two commercial trips per day in unrestricted zones will prevent this from occurring. Third, this limit will prevent commercial groups from dominating any one area and therefore further the intent of the Wilderness Act.

These limits apply in all zones at all times in addition to the other restrictions noted above.

<sup>28</sup> See *High Sierra Hikers v. Blackwell*, 390 F.3d 630 (9th Cir. 2004); *High Sierra Hikers Association v. Weingardt*, 521 F. Supp. 2d 1065 (2007) (holding invalidates the USFS commercial use needs assessment in part because it failed to control harmful spikes in use).

<sup>29</sup> For a review of the research demonstrating that harms caused by new impacts to areas not previously impacted are more extensive than harms to previously impacted areas (the “impact curve”), see Hammit, W. & Cole, D. (1998) *Wildland Recreation: Ecology and Management*, 2d ed., New York: John Wiley

<sup>30</sup> Recent empirical research on visitor experience in the Yosemite Wilderness has documented a visitor preference not to encounter stock parties and large campsites. See Newman, P., Manning, R. E., Dennis, D. F., & McKonly. (2005). Informing carrying capacity decision making in Yosemite National Park, USA using stated choice modeling. *Journal of Park and Recreation Administration*, 23(1), 75-89.



## **PART 7: EXTENT NECESSARY CALCULATIONS FOR THE MERCED RIVER CORRIDOR**

The following is an application of the rules in Part 7 to the wilderness portions of the Merced River corridor. They apply only to the Merced River corridor, and do not apply to commercial use associated with the High Sierra Camps. The allocations are summarized in Table 1. Some trips may realize all three purposes. Such trips will be allocated according to the purpose allocation that is most favorable to the commercial service provider.<sup>31</sup>

### **A. Limits on all Commercial Use:**

- No camping or travel by commercial groups allowed more than ¼ mile from a maintained trail or public access road. No camping allowed in the Mount Lyell zone (The entire zone is off trail.) No more than two overnight commercial groups per night per zone.
- All commercial stock trips are limited to a 1:1.5 stock to person ratio. Accordingly, for every multiple of 3 persons (including employees), only two pack animals are allowed in addition to 3 riding stock. See section 9 B.

### **B. Limits on Commercial Trips that only Realize the Recreational Purpose:**

#### **1. Overnight Use**

- Restricted zones (LYV, June, July and August only; Merced Lake, July and August only): No overnight commercial use allowed.
- Weekend restricted zones (LYV, May and September only; Merced Lake, September only): Commercial use allowed on weekdays; but prohibited on weekends and holidays. (This means no overnight stays on Friday and Saturday nights or Sunday night before a Monday holiday. July 4th will only be treated as a holiday during years when the federal holiday forms a three day weekend.
- Commercial trips allowed in the Washburn Lake, Clark Range, South Fork, Johnson Creek, and Chilnualna Creek zones all year. Commercial trips allowed in the LYV zone October through April and the Merced Lake zones October through June.

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<sup>31</sup> Such trips are also favorably evaluated under the minimum requirements analysis described in section 9 below because they help to realize multiple purposes at a lower impact than would multiple trips.

**TABLE 1. COMMERCIAL RESTRICTIONS SUMMARY**

Overnight Use								
	Other Zones			Weekend Restricted Zones			Restricted Zones	
For commercial groups that realize:	<ul style="list-style-type: none"><li>Washburn Lake, Clark Range, South Fork, Johnson Creek, and Chilnualna Creek</li><li>LYV zone October through April and the Merced Lake zones October through June</li></ul>			<ul style="list-style-type: none"><li>LYV, May and September only; Merced Lake, September only</li></ul>			<ul style="list-style-type: none"><li>LYV, June, July and August only; Merced Lake, July and August only</li></ul>	
Only the recreational purpose	<ul style="list-style-type: none"><li>No off-trail travel</li><li>1:1.5 stock to person ratio</li><li>Two commercial groups per zone per night</li></ul>			<ul style="list-style-type: none"><li>No off-trail travel</li><li>1:1.5 stock to person ratio</li><li>Two commercial groups per zone per night Monday-Thursday nights. No overnight use on weekend and holiday nights.</li></ul>			<ul style="list-style-type: none"><li>No overnight use</li></ul>	
The recreational and educational purposes	<ul style="list-style-type: none"><li>No off-trail travel</li><li>1:1.5 stock to person ratio</li><li>two commercial groups per zone per night</li></ul>			<ul style="list-style-type: none"><li>No off-trail travel</li><li>1:1.5 stock to person ratio</li><li>Two commercial groups per zone per night</li><li>Merced Lake zone: Limited to 44 weekend use nights per month.</li><li>LYV zone: Limited to 131 weekend use nights per month.</li></ul>			<ul style="list-style-type: none"><li>No off-trail travel</li><li>Merced Lake zone: No commercial use allowed.</li><li>LYV zone: Limited to 465 use nights per month.</li></ul>	
The recreational and scenic purposes	<ul style="list-style-type: none"><li>No off-trail travel</li><li>1:1.5 stock to person ratio</li><li>Two commercial groups per zone per night</li></ul>			<ul style="list-style-type: none"><li>No off-trail travel</li><li>1:1.5 stock to person ratio</li><li>Two commercial groups per zone per night</li><li>Merced Lake zone: Limited to 22 weekend use nights per month.</li><li>LYV zone: Limited to 65 weekend use nights per month.</li></ul>			<ul style="list-style-type: none"><li>No off-trail travel</li><li>Two commercial groups per zone per night</li><li>Merced Lake zone: Limited to 78 use nights per month.</li><li>LYV zone: Limited to 233 use nights per month.</li></ul>	
Merced River Corridor Summary								
Month	Zone							
	South Fork	Johnson Creek	Chilnualna Creek	Clark Range	Washburn Lake	Mount Lyell	Merced Lake	LYV
May						No Camping		Weekend Restricted
June						No camping		Restricted
July						No camping	Restricted	Restricted
August						No camping	Restricted	Restricted
September						No camping	Weekend Restricted	Weekend Restricted

## **C. Limits on Commercial Trips that Realize the Recreational and Educational Purposes:**

### **1. Overnight Use**

- Restricted zones (LYV, June, July and August only; Merced Lake, July and August only):  
Merced Lake zone: Commercial use prohibited because commercial education associated with the High Sierra Camp Loop Trips conducted by the National Park Service exceeds 10% of capacity, which makes it unnecessary to allocate additional capacity for commercial use in support of the educational purpose on this trail corridor. LYV zone: A negligible amount of noncommercial formal education is occurring. Commercial use limited to 465 use nights per month.<sup>32</sup>
- Weekend restricted zones (LYV, May and September only; Merced Lake, September only):  
Commercial use allowed on weekdays. For weekends and holidays (as defined above) commercial use limited to 131 weekend use nights per month in the LYV zone<sup>33</sup> and 44 weekend use nights per month in the Merced Lake zone.<sup>34</sup> Commercial use allowed on weekdays.
- Commercial trips allowed in the Washburn Lake, Clark Range, South Fork, Johnson Creek, and Chilnualna Creek zones all year. Commercial trips allowed in the LYV zone October through April and the Merced Lake zones October through June.

## **D. Limits on Commercial Trips that Realize the Recreational and Scenic Purposes:**

### **1. Overnight Use**

- Restricted zones (LYV, June, July and August only; Merced Lake, July and August only):  
Merced Lake zone: A negligible amount of noncommercial, formal scenic use is occurring. Use limited to 78 use nights per month.<sup>35</sup> LYV zone: A negligible amount of noncommercial scenic use is occurring. Commercial use limited to 233 use nights per month.<sup>36</sup>

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<sup>32</sup> Calculated as follows: Capacity for LYV is 150 people per night.  $150 \times 31$  (number of nights/month) equals 4650 use nights. 10% of 4650 equals 465 use nights. Average noncommercial educational use nights (college classes, etc), average, 2009-2010 is 0 use nights. 465 minus 0 equals 465 use nights available for commercial education.

<sup>33</sup> Calculated as follows: Capacity for LYV is 150 people per night.  $150 \times 8.7$  (average number of weekend nights/month) equals 1305 use nights. 10% of 1305 equals 131 use nights. Average noncommercial educational use nights (college classes, etc), average, 2009-2010 is 0 use nights. 131 minus 0 equals 131 use nights available for commercial formal education.

<sup>34</sup> Calculated as follows: Capacity for Merced Lake is 50 people per night.  $50 \times 8.7$  (average number of weekend nights/month) equals 435 use nights. 10% of 435 equals 44 use nights. Average noncommercial educational use nights (college classes, etc), average, 2009-2010 is 0 use nights. 44 minus 0 equals 44 use nights available for commercial formal education.

<sup>35</sup> Calculated as follows: Capacity for Merced Lake is 50 people per night.  $50 \times 31$  nights per month equals 1550 use nights. 5% of 1550 equals 78 use nights. Average noncommercial scenic use nights (college classes, etc), average, 2009-2010 is 0 use nights. 78 minus 0 equals 78 use nights available for commercial scenic use.

<sup>36</sup> Calculated as follows: Capacity for LYV is 150 people per night.  $150 \times 31$  nights per month equals 4650 use nights. 5% of 4650 equals 233 use nights. Average noncommercial scenic use nights (college classes, etc), average, 2009-2010 is 0 use nights. 233 minus 0 equals 233 use nights available for commercial scenic use.

- Weekend restricted zones (LYV, May and September only; Merced Lake, September only): Commercial use allowed on weekdays. For weekends and holidays (as defined above), commercial use limited to 65 use nights per month in the LYV zone<sup>37</sup> and 22 use nights per month in the Merced Lake zone.<sup>38</sup>
- Commercial trips allowed in the Washburn Lake, Clark Range, South Fork, Johnson Creek, and Chilnualna Creek zones all year. Commercial trips allowed in the LYV zone October through April and the Merced Lake zones October through June.

## PART 8: THE COMMERCIAL USE APPLICATION PROCESS

### A. Procedures Applicable to All Commercial Services in Wilderness

Implementation of this Extent Necessary Determination will be integrated into Yosemite's CUA and SUP application procedures and concession management operations. All entities, including concessioners CUA holders, and SUP holders desiring to provide commercial services in the designated wilderness of the Merced River corridor shall do the following:

- (1) The concessioner, CUA, or Special Use Permit holder must submit a proposed trip itinerary to the Yosemite Wilderness Office by May 1 or as soon as is feasible. The itinerary must be received prior to any trip entry into the park. The itinerary must provide a schedule of planned trips. For overnight trips, the itinerary must include the dates, point of entry and exit, each night's camping location, and the group size (including employees). Day trips must include the date, group size, trailhead, and destination. Itineraries received prior to May 1 will be used to assign trips for the summer season and may include a second and third choice of trips.
- (2) For educational and scenic trips, the applicant must submit an explanation of the manner in which the proposed commercial trip meets the educational or scenic purposes, along with copies of, or internet links to, all advertising and other promotional materials related to that trip and submit educational syllabus for trip and documentation showing that employees are trained and qualified to provide such education.

### B. The Minimum Requirement Concept

By policy, the National Park Service must apply the minimum requirement concept to decisions about commercial use in wilderness.<sup>39</sup> The minimum requirement concept is a two part process that determines "if administrative actions, projects, or programs undertaken by the Service or its agent and affecting wilderness character, resources, or the visitor experience are necessary, and, if so how to minimize impacts."<sup>40</sup>

<sup>37</sup> Calculated as follows: Capacity for LYV is 150 people per night.  $150 \times 8.7$  (average number of weekend nights/month) equals 1305 use nights. 5% of 1305 equals 65 use nights. Average noncommercial scenic use nights, average, 2009-2010 is 0 use nights. 65 minus 0 equals 65 use nights available for commercial scenic use.

<sup>38</sup> Calculated as follows: Capacity for Merced Lake is 50 people per night.  $50 \times 8.7$  (average number of weekend nights/month) equals 435 use nights. 5% of 435 equals 22 use nights. Average noncommercial scenic use nights, average, 2009-2010 is 0 use nights. 22 minus 0 equals 22 use nights available for commercial scenic use.

<sup>39</sup> NPS Management Policies 2006 6.4.4

<sup>40</sup> NPS Management Policies 2006 6.3.5

As part of the minimum requirement process, the National Park Service weighs the impacts and benefits to wilderness character. Commercial trips that realize more than one purpose accrue more benefit to wilderness character than those that only realize one purpose but have the same amount of impact. For this reason trips that realize a higher number of purposes will receive preference over those realizing a lower number of purposes when allocating access.

Part of a minimum requirement decision is determining whether an activity is wilderness dependent. Wilderness dependence as used here means if the activity can occur outside of wilderness with little loss of value, it should not take place in wilderness. The wilderness dependence criteria will be used during the application screening process. Commercial trips whose primary purpose is teaching a subject that is not wilderness dependent will be treated as recreational rather than educational. Examples of such topics are weight loss and cooking.

Consistent with this concept, when two commercial groups that are realizing the same number of purposes are competing for the same date in the same location, the lower impact trip will be given preference. When comparing otherwise equivalent commercial stock trips preference will be given to the trip with the lower stock-to-client ratio.

In order to minimize the impacts of commercial stock use, all commercial stock trips are limited to a 1:1.5 stock to person ratio. Accordingly, for every multiple of 3 persons (including employees), only two pack animals are allowed in addition to 3 riding stock.

### **C. Process for Allocating Proposed Trips**

In the event that there is more than one entity that desires to provide Commercial Services on the same date in the same zone, priority shall be determined by the application of the following steps, in order:

- (1) Each proposed commercial trip shall be awarded one (1) point for each wilderness public purpose (i.e., recreational, educational, scenic) that it realizes. Priority shall be granted to proposed trips with higher point totals;
- (2) Proposed commercial trips that utilize a lower-impact mode of transportation will be given priority over those using higher impact modes of transportation; and
- (3) In the case of otherwise comparable stock trips, the trip with the lowest stock to client ratio will be given priority.
- (4) Any remaining conflicting proposed commercial trips after the application of steps (1) through (3) above will be resolved through a lottery for proposed commercial trips that will be conducted on May 1 of each calendar year.

All trips proposed after the May 1 lottery will be allocated on a first come first served basis. With respect to trips requested on the same date, any conflicts over requested dates and trailheads will be resolved by the application of steps (1) through (4) above.

## **D. Compliance**

Wilderness Rangers routinely check on Commercial Trips in the field to assure compliance with park regulations. An assessment of the extent to which a Commercial Service provider has met its objective with respect to satisfaction of wilderness purposes will be added to the CUA contact form, for example to evaluate the claim that wilderness education is being provided by qualified personnel in addition to recreation.

Failing to provide promised educational or scenic opportunities may be grounds for limiting a commercial service provider's ability to provide future commercial trips in the Yosemite Wilderness.

## **PART 9: THE REASSESSMENT PROCESS**

The limits on commercial use imposed by this plan will be recalculated when significant changes in use patterns occur. Two current actions may affect this process. The first is research on wilderness travel patterns that was completed in 2010. Trailhead quotas will be adjusted based on the results of this study. As a result, travel patterns may change in a way that would affect the results of an Extent Necessary Determination. In addition, the National Park Service has taken the initial steps of rewriting the Yosemite Wilderness Stewardship Plan which will include an Extent Necessary Determination for the entire wilderness. At that time both visitor use patterns and the Extent Necessary methodology will be reevaluated.

**APPENDIX M**

**CHANGES TO THE ORVS OVER TIME**

## APPENDIX M

### COMPARISON OF MERCED RIVER OUTSTANDINGLY REMARKABLE VALUES OVER TIME (1986-PRESENT)

#### SEGMENT 1: Main Stem Wilderness (Headwaters To Top Of Nevada Fall)

##### Geologic/Hydrologic Outstandingly Remarkable Values (ORVs)

1986 Sierra National Forest Draft Land and Resource Management Plan	Most spectacular glaciated valley in world, granite cliffs and Domes
1996 Draft Yosemite Valley Housing Plan	Glaciation, cirques, "Lost" and "Twin Bridges" hanging valley separated by cascades; world's largest concentrations of granite domes  River gradient from 13,000 to 6,000 feet, glaciers, pristine water quality, log jams
2000 and 2005 Merced River Plans	U-shaped, glacially carved canyon, cascades and soda springs below Washburn Lake  Free flowing, gradient drop, glacial remnants, logjam, numerous cascades
2008 Draft ORVs	Glacial processes  River gradient drop, rapid snowmelt producing high-volume spring flows
2010 Draft ORVs	Large-scale, U-shaped glacially carved canyon, above Brunell Point shows relationship between geology and river course
2011 Spring Draft Baseline Conditions Report	Following the path of the ancient Merced River, glaciers gouged a textbook U-shaped canyon with sheer granite walls rising steeply above
2011 Fall Planning Workbook	The upper Merced River canyon is a textbook example of a canyon that was carved by glaciers
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	The upper Merced River canyon is a textbook example of a glacially-carved canyon
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** The cascades, soda springs, and logjam were removed as they are not rare, unique, or exemplary. Free-flowing conditions are an established river value. Geology experts have noted that the canyon is not U-shaped, yet it remains a textbook example of a glacially-carved granite canyon. The geologic and hydrologic river values were merged in the 2010 *Draft ORV* report because these values overlap and are best described and managed as a single value.



## SEGMENT 1: Main Stem Wilderness (Headwaters To Top Of Nevada Fall)

### Biological ORV

1986 Sierra National Forest Draft Land And Resource Management Plan	Vegetation: state listed rare species
1996 Draft Yosemite Valley Housing Plan	Large specimens of western juniper above Washburn Lake, white fir above LYV, rare plant: Eriophyllum congdonii, rare wildlife: Mt. Lyell salamander, mountain yellow-legged frog, Yosemite toad
2000 and 2005 Merced River Plans	Sierra riverine environments, high-quality riparian, meadow, aquatic habitats, special status-species such as mountain yellow-legged frog
2008 Draft ORVs*	Riparian and wetland habitats, rare and special-status plant and animal species: willow flycatcher, Sierra Nevada yellow-legged frog, harlequin duck, black swift, and Tompkin's sedge
2010 Draft ORVs	Meadows, riparian habitats, annual flooding, 8 of 9 special status animal species
2011 Spring Draft Baseline Condition Report	Numerous, exquisite small meadows and relatively intact adjacent riparian habitats support several rare bird and mammal species
2011 Fall Planning Workbook	The Merced River creates numerous, small meadows and relatively intact adjacent riparian habitats
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	The Merced River contains numerous small meadows and riparian habitat with high biological integrity

**Rationale:** Special-status species were removed because they are not strictly river related or river dependent. The ORV was revised to include the meadow and riparian habitat in its entirety that, in addition, to existing U.S. Fish and Wildlife Service and California Department of Fish and Game protocol, would serve to protect special status species and other riparian and meadow species found along the Merced River corridor.

## SEGMENT 1: Main Stem Wilderness (Headwaters To Top Of Nevada Fall)

### Recreational ORV

1986 Sierra National Forest Draft Land and Resource Management Plan	No Recreational ORV
1996 Draft Yosemite Valley Housing Plan	Travel and camping in LYV, Merced Lake, Washburn Lake
2000 and 2005 Merced River Plans	Solitude, primitive & unconfined, day hiking, backpacking, horseback riding and packing, camping, enjoyment of natural river sounds, untrailed sections
2008 Draft ORVs	Hiking, backpacking, writing, contemplation, nature study, photography, artistic expression, fishing, camping, and picnicking--create memories, traditions, and bonding
2010 Draft ORVs	Hiking and backpacking, wilderness experiences, solitude, personal reflection, closeness to nature, independence, self-reliance, primitive travel, camping, exploration, and adventure.

Spring 2011 Draft Baseline Conditions Report	The Merced River, spectacular High Sierra landscape, dramatic scenery, natural sounds, and abundant opportunities for solitude combine to produce a variety of exceptional wilderness-oriented recreational activities.
2011 Fall Planning Workbook	Visitors to federally-designated Wilderness in the corridor engage in a variety of activities in an iconic High Sierra landscape, where opportunities for primitive and unconfined recreation, self-reliance, and solitude shape the experience
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** All specific activities were removed from the title of the ORV and an emphasis was placed on the river-related elements of wilderness character that are exemplary in this river segment.

## SEGMENT 1: Main Stem Wilderness (Headwaters To Top Of Nevada Fall)

### Scenic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	One of the most spectacular scenic canyons in the world, waterfalls
1996 Draft Yosemite Valley Housing Plan	Glaciated Merced Lake, Washburn Lake river Canyon; Bunnell Cascades and confluences of tributaries, Clark and Cathedral ranges
2000 and 2005 Merced River Plans	Views of glaciated river canyon, Merced Lake, Washburn Lake Bunnell Cascades, confluence of tributaries, granite domes, Clark and Cathedral ranges
2008 Draft ORVs	Seasonal and daily changes, lighting on granite walls, domes, meadows, calm water, rushing cascades, scenic experience encourages interpretation and education
2010 Draft ORVs	Patternoster Lakes, Montane forest, U-shaped glacial valley, several scenic landmarks listed, natural setting, exceptional scenery
Spring 2011 Draft Baseline Conditions Report	Same as 2010
2011 Fall Planning Workbook	Visitors to this Wilderness segment experience scenic views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Visitors to this Wilderness segment experience exemplary views of serene montane lakes, pristine meadows, slickrock cascades, and High Sierra peaks

**Rationale:** Views of Bunnell Cascades and paternoster lakes were removed as they are not rare, unique or exemplary. Views of the Clark and Cathedral Ranges were removed as they are not always visible from the river corridor. A more appropriate and accurate list of exemplary High Sierra scenic views was subsequently developed.

## SEGMENT 1: Main Stem Wilderness (Headwaters To Top Of Nevada Fall)

### Cultural ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Cultural ORV
1996 Draft Yosemite Valley Housing Plan	Prehistoric, trans-Sierran route used for 3-4 thousand years, 24 archeological sites, 28 historic structures at Merced Lake
2000 and 2005 Merced River Plans	Prehistoric, trans-Sierran route used for thousands of years, prehistoric sites, homestead sites, trails, river crossings, HSC, and structures
2005 MRP	Same as 2000
2008 Draft ORVs	Trails along Merced for trade and cultural exchange for thousands of years, archeological sites, American Indian spiritual associations
2010 Draft ORVs	No Cultural ORV
2011 Fall Planning Workbook	No Cultural ORV
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	No Cultural ORV
2013 Draft Comprehensive Management Plan and EIS	No Cultural ORV

**Rationale:** The prehistoric, trans-Sierran route used for thousands of years, prehistoric sites, homestead sites, trails, river crossings, and the Merced Lake High Sierra Camp and structures were excluded from the list of ORVs as they are not rare, unique, or exemplary in a regional or national context.

## SEGMENT 2: Yosemite Valley, Top Of Nevada Fall To Former Cascades Diversion Dam

### Geologic/Hydrologic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Most spectacular glaciated valley in world, granite cliffs & Domes
1996 Draft Yosemite Valley Housing Plan	Largest glaciated valley in Sierra, hanging valleys, terminal moraine, exfoliation, exposed granite monoliths World-class waterfalls, flood regime, oxbows, Mirror Lake
2000 and 2005 Merced River Plans	Glaciated U-shaped valley, mature meandering river, hanging valleys listed, glaciation (moraines) Meandering river, world-renowned waterfalls, flood regime, oxbows, wetlands, fluvial processes
2008 Draft ORVs	Glacial processes formed U-shaped valley, Giant Staircase, El Cap moraine, active rock falls Meandering river, hanging valleys, world-renowned waterfalls
2010 Draft ORVs	Giant Staircase, El Cap Moraine, Glacial action creating hanging valleys and world-renowned waterfalls, meandering and alluvial river (gentle gradient, flood regime, woody debris, riparian vegetation)
Spring 2011 Draft Baseline Conditions	The "Giant Staircase," which includes Vernal and Nevada Falls, is one of

Report	the finest examples of stair-step river morphology in the country. Yosemite Valley has exemplary glacial geology on display, from spectacular hanging valleys to textbook recessional moraines. From Happy Isles to the west end of the valley, the Merced River is a rare example of a mid-elevational alluvial river.
2011 Fall Planning Workbook	The "Giant Staircase," which includes Vernal and Nevada Falls, is one of the finest examples in the western United States of stair-step river morphology.  The El Capitan Moraine is an extraordinary example of a recessional moraine.  The Merced River from Happy Isles to the west end of Yosemite Valley provides an outstanding example of a rare, mid-elevation alluvial river.
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	The "Giant Staircase," which includes Vernal and Nevada Falls, is one of the finest examples in the western United States of stair-step river morphology.  The Merced River from Happy Isles to the west end of Yosemite Valley provides an outstanding example of a rare, mid-elevation alluvial river.

**Rationale:** Oxbows, wetlands, and fluvial processes are included in the biological ORV or are included within the expression "meandering and alluvial river." Woody debris and riparian vegetation were added because they are examples of alluvial river functions. In the fall 2011 workbook, The El Capitan Moraine and Giant Staircase were identified as independent ORVs because the management of these values is different than the management of the alluvial river. In the November 2012 draft environmental impact statement, the El Capitan Moraine ORV was removed because moraines are widespread across the Sierra Nevada and it is not unique or exemplary, nor is it strictly river related.

## SEGMENT 2: Yosemite Valley (Top Of Nevada Fall To Former Cascades Diversion Dam)

### Biological ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Vegetation: state-listed rare species Wildlife: peregrine falcon
1996 Draft Yosemite Valley Housing Plan	Half of all plant species in the park found in Valley, riparian and meadow areas, California black oak, wildlife habitat, listing several rare species, including indigenous rainbow trout
2000 and 2005 Merced River Plans	Riparian and meadow areas, riparian wetland, riverine areas, habitat for river-related species, special-status species, neo-tropical songbirds, bat species
2008 Draft ORVs	Riparian and wetland habitats, rare and special-status plant and animal species: willow flycatcher, Sierra Nevada yellow-legged frog, harlequin duck, black swift, and Tompkin's sedge, Happy Isles fen
2010 Draft ORVs	Meadows, riparian vegetation, high water table, eight rare wildlife species, bat species, sedge species- all due to year-round water availability

Spring 2011 Draft Baseline Conditions Report	The large, moist meadows and associated riparian communities comprise one of the largest mid-elevation meadow complexes in the Sierra Nevada, supporting an exceptional diversity of plant and animal species.
2011 Fall Planning Workbook	The meadows and riparian communities of Yosemite Valley comprise one of the largest mid-elevation meadow complexes in the Sierra Nevada.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** The Happy Isles fen and neotropical songbirds were removed because they are not river related or dependent. Special status species were also removed because they are not strictly river related or dependent. The ORV was subsequently revised to include the meadow and riparian habitat in its entirety, which, in addition to existing US Fish and Wildlife Service and California Department of Fish and Game protocol, will serve to protect special status species in addition to other riparian and meadow species found along the Merced River corridor.

## SEGMENT 2: Yosemite Valley (Top Of Nevada Fall To Former Cascades Diversion Dam)

### Recreational ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Premier outdoor recreation area in world, picnicking, fishing, swimming, river rafting
1996 Draft Yosemite Valley Housing Plan	Hiking, picnicking, camping, climbing, skiing, fishing, photography, swimming, nature study, horseback riding, biking, sightseeing, and boating
2000 and 2005 Merced River Plans	River-related rec activities, nature study & sightseeing to hiking, one of the premier outdoor rec areas in the world
2008 Draft ORVs	Hiking, backpacking, writing, contemplation, nature study, photography, artistic expression, fishing, camping, and picnicking--create memories, traditions, and bonding, Mist Trail, swimming and floating
2010 Draft ORVs	World-renowned destination, World Heritage Site, outdoor river-related recreation, active pursuits listed, creative pursuits listed, opportunities for all ages and abilities
Spring 2011 Draft Baseline Conditions Report	The Valley's incredible setting – with its striking cliffs and waterfalls towering above a meandering river and extensive moist meadows – provides for a variety of active, creative, educational, social, and reflective experiences.
2011 Fall Planning Workbook	Visitors to Yosemite Valley enjoy a wide variety of river-related recreational activities in the Valley's extraordinary setting along the Merced River
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** All specific activities were removed from the title of the ORV and an emphasis was placed on the river-related elements of wilderness character that are exemplary in this river segment.

## SEGMENT 2: Yosemite Valley (Top Of Nevada Fall To Former Cascades Diversion Dam)

### Scenic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	One of most spectacularly scenic canyons in the world, waterfalls
1996 Draft Yosemite Valley Housing Plan	Specific examples of Waterfalls, rock cliffs, & meadows, black oak woodlands, interface of river, rock, meadow, and forest, 18 identified historic vistas
2000 and 2005 Merced River Plans	Specific examples of waterfalls, rock cliffs, & meadows; interface of river, rock, meadow, and forest
2008 Draft ORVs	Specific valley views listed, depictions of the valley in early tourism posters encourage the creation of the NPS, scenic experience encourages interp and education
2010 Draft ORVs	Famous landmarks listed, compound oxbows, wetlands, and meadows, Montane forest and sheer rock faces create intense contrast and scenic river-related views
Spring 2011 Draft Baseline Conditions Report	Crashing over Nevada and Vernal Falls and then meandering quietly under 2,000-foot cliffs, the Merced forms a placid foreground to some of the world's most iconic scenery.
2011 Fall Planning Workbook	Visitors to Yosemite Valley experience scenic views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Visitors to Yosemite Valley experience views of some of the world's most iconic scenery, with the river and meadows forming a placid foreground to towering cliffs and waterfalls.

**Rationale:** This ORV has remained generally consistent over time.

## SEGMENT 2: Yosemite Valley (Top Of Nevada Fall To Former Cascades Diversion Dam)

### Cultural ORVs

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Indian sites along river, Miwok area
1996 Draft Yosemite Valley Housing Plan	100 archeological sites, prehistoric people habitation, traditionally used plants, spiritual areas, prehistoric trail junctions, first land area and river designated for preservation in US, historical resources and landscapes
2000 and 2005 Merced River	Thousands of years of human occupation, archeological sites, continuing traditional use, designed landscapes & developed areas, historic buildings,

Plans	circulation systems providing access to natural features that are culturally valuable
2008 Draft ORVs	Trails along Merced for trade and cultural exchange for thousands of years, cultural landscapes reflecting human footprint, archeological sites, American Indian spiritual associations
2010 Draft ORVs	Traditional Cultural Property representing people in area before 1851 to present, traditionally used plants, village sites, and spiritual areas, archeological sites, river-dependent culture
Spring 2011 Draft Baseline Conditions Report	<p>The Yosemite Valley Archeological District is a nearly continuous, river-related archeological landscape containing dense concentrations of resources that reflect thousands of years of settlement.</p> <p>The Yosemite Valley potential Traditional Cultural Property (TCP) represents a rare connection of places and people that began before 1851 and continues to the present, with the river at the heart of this cultural system.</p>
2011 Fall Planning Workbook	<p>The Yosemite Valley Archeological District is a nearly continuous, river-related archeological landscape containing dense concentrations of resources that reflect thousands of years of settlement.</p> <p>The Yosemite Valley potential Traditional Cultural Property (TCP) represents a rare connection of places and people that began before 1851 and continues to the present, with the river at the heart of this cultural system.</p>
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	<p>The Yosemite Valley Archeological District is a linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River.</p> <p>Yosemite Valley American Indian ethnographic resources include a linked landscape of specifically mapped, traditional-use plant populations and other ongoing cultural practices.</p>
2013 Draft Comprehensive Management Plan and EIS	<p>The Yosemite Valley Archeological District is an unusually rich and linked landscape that contains dense concentrations of resources that represent thousands of years of human settlement along this segment of the Merced River.</p> <p>Yosemite Valley American Indian ethnographic resources include a linked landscape of specifically mapped, traditional-use plant populations, as well as the ongoing traditional cultural practices that reflect the intricate continuing relationship between indigenous peoples of the Yosemite region and the Merced River in Yosemite Valley.</p> <p>Yosemite Valley Historic Resources: Represent a linked landscape of river-related or river dependent, rare, unique or exemplary buildings and structures that bear witness to the historical significance of the river system.</p>

**Rationale:** Prehistoric trail junctions and circulation systems were removed as they are not rare, unique, or exemplary.

Historic buildings were removed because they are not river related or dependent.

Circulation systems were removed because they are not rare, unique, or exemplary; most river-canyon circulation systems are structured similarly.

The Yosemite Valley Archeological District was identified as a separate ORV from the ethnographic resources because the management strategies for these values can be different. The Yosemite Valley

Archeological District encompasses a complete interrelated landscape of archeological resources that must be managed as a district.

The term American Indian is the preferred term.

The Yosemite Valley Historic Resources ORV was added to recognize the significance of this exemplary river related historic landscape and to better protect it in its entire context along the Merced River corridor.

### SEGMENT 3: Merced Gorge (Former Cascades Diversion Dam To Western Park Boundary)

#### Geologic/Hydrologic

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Geologic/Hydrologic ORV
1996 Draft Yosemite Valley Housing Plan	Transition from U-shaped, glaciated valley to V-shaped gorge "Young river"
2000 and 2005 Merced River Plans	Transition from U-shaped valley to V-shaped gorge with steep gradient Exceptionally steep gradients (2,000 foot elevation drop in 6 miles)
2008 Draft ORVs	Glacial Processes River gradient drop, rapid snowmelt producing high-volume spring flows, rock-fall driven morphology resulting in the deposition of enormous boulders
2010 Draft ORVs	No Geologic/Hydrologic ORV
Spring 2011 Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2011 Fall Planning Workbook	No Geologic/Hydrologic ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2013 Draft Comprehensive Management Plan and EIS	No Geologic/Hydrologic ORV

**Rationale:** Transition from U-shaped valley to V-shaped gorge with steep gradient was removed as it is not rare, unique, or exemplary; most Sierra rivers have such a transition.

### SEGMENT 3: Merced Gorge (Former Cascades Diversion Dam To Western Park Boundary)

#### Biological ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Vegetation: state-listed rare species Wildlife: peregrine falcon
1996 Draft Yosemite Valley Housing Plan	Diverse riparian areas intact and almost entirely undisturbed, canyon live oak research, indigenous rainbow trout



2000 and 2005 Merced River Plans	Rich and diverse riparian habitat associated with intact special status species that are relatively undisturbed
2008 Draft ORVs	Riparian and wetland habitats, rare and special-status plant and animal species: willow flycatcher, Sierra Nevada yellow-legged frog, harlequin duck, black swift, & Tompkin's sedge
2010 Draft ORVs	No Biological ORV
Spring 2011 Draft Baseline Conditions Report	No Biological ORV
2011 Fall Planning Workbook	No Biological ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Biological ORV
2013 Draft Comprehensive Management Plan and EIS	No Biological ORV

**Rationale:** Rich and diverse riparian habitat associated with intact special status species that are relatively undisturbed was removed as it is not rare, unique, or exemplary.

### **SEGMENT 3: Merced Gorge (Former Cascades Diversion Dam To Western Park Boundary)**

#### **Recreational ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Recreational ORV
1996 Draft Yosemite Valley Housing Plan	Picnicking, climbing, fishing, photography, and sightseeing
2000 and 2005 Merced River Plans	River-related recreational opportunities: Picnicking, fishing, photography, and sightseeing
2008 Draft ORVs	Views of granite cliffs, roar and vibrations of river during spring runoff, picnicking--create memories, traditions, and bonding
2010 Draft ORVs	Scenic driving and access to several pools and beaches for swimming, fishing, and picnicking; natural setting and opportunities for solitude
Spring 2011 Draft Baseline Conditions Report	The rushing and cascading river, interspersed with scheduled holes, provides the setting for relaxing river-related activities.
2011 Fall Planning Workbook	No Recreational ORV
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	No Recreational ORV
2013 Draft Comprehensive Management Plan and EIS	No Recreational ORV

**Rationale:** The recreational ORV was removed from this segment because none of the river-related or dependent activities are rare, unique, or exemplary.

### SEGMENT 3: Merced Gorge (Former Cascades Diversion Dam To Western Park Boundary)

#### Scenic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	One of most spectacularly scenic canyons in the world, waterfalls
1996 Draft Yosemite Valley Housing Plan	View of Pulpit Rock and Rainbow, views of specific waterfalls and rocks listed, V-shaped gorge; the river and its cascades
2000 and 2005 Merced River Plans	Views of the Cascades, spectacular rapids among giant boulders, views of specific waterfalls and rocks listed
2008 Draft ORVs	Seasonal and daily changes, lighting on granite walls, calm water, rushing cascades, scenic experience encourages interpretation and education
2010 Draft ORVs	Narrow gorge, massive boulders, canyon walls and cliffs, waterfalls, parades of color
Spring 2011 Draft Baseline Conditions Report	Descending 2,000 feet in 14 miles, the river is a continuous cascade under spectacular Sierra granite outcrops and domes.
2011 Fall Planning Workbook	The Merced River drops 2,000 feet over 14 miles; a continuous cascade under spectacular Sierra granite outcrops and domes.
2012 Preliminary Concepts Workbook and Draft Baseline Condition Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	The Merced River drops 2,000 feet over 14 miles, a continuous cascade under exemplary Sierra granite outcrops and domes.

**Rationale:** Present language is consistent with statements made in the past.

### SEGMENT 3: Merced Gorge (Former Cascades Diversion Dam To Western Park Boundary)

#### Cultural ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Indian sites along river, Miwok area
1996 Draft Yosemite Valley Housing Plan	Archeological sites in the Cascades area
2000 and 2005 Merced River Plan	Prehistoric sites and historic sites & structures such as those relating to historic engineering projects
2008 Draft ORVs	Trails along Merced for trade and cultural exchange for thousands of years, archeological sites, American Indian spiritual associations
2010 Draft ORVs	No Cultural ORV
Spring 2011 Draft Baseline Conditions Report	No Cultural ORV
2011 Fall Planning Workbook	No Cultural ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Cultural ORV
2013 Draft Comprehensive Management Plan and EIS	No Cultural ORV

**Rationale:** Prehistoric sites and historic sites & structures such as those relating to historic engineering projects were removed as they are not rare, unique, or exemplary.

#### **SEGMENT 4: El Portal (Parkline To El Portal Administrative Site Boundary)**

##### **Geologic/Hydrologic ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Contact between metasedimentary & granitic rocks
1996 Draft Yosemite Valley Housing Plan	Transition from igneous to meta-sedimentary rocks--possibly oldest in Sierra Nevada Continuous rapids throughout segment
2000 and 2005 Merced River Plans	Transition from igneous to metasedimentary rocks--among oldest in Sierra Nevada Continuous rapids
2008 Draft ORVs	Glacial Processes
2010 Draft ORVs	No Geologic/Hydrologic ORV
Spring 2011 Draft Baseline Conditions Report	Changing river gradients, glacial history, and powerful floods created a boulder bar whose huge boulders are much larger than typically found in such deposits.
2011 Fall Planning Workbook	No Geologic/Hydrologic ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	The boulder bar in El Portal was created by changing river gradients, glacial history, and powerful floods. These elements have resulted in accumulation of extraordinary, large boulders, which are rare in such deposits.
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** The language was revised to more clearly explain the origin of the boulder bar in El Portal.

Transition from igneous to meta-sedimentary rocks--among oldest in Sierra Nevada was removed as it is not rare, unique, or exemplary (occurring on most rivers flowing west from the Sierra crest).

#### **SEGMENT 4: El Portal (Parkline To El Portal Administrative Site Boundary)**

##### **Biological ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Vegetation: state-listed rare species
1996 Draft Yosemite Valley Housing Plan	Rare plant species listed, valley elderberry longhorn beetle and its habitat, spotted owl habitat, riparian zone for wildlife species

2000 and 2005 Merced River Plans	Riverine habitats: riparian woodlands associated with special-status species, Tompkin's sedge and Valley elderberry longhorn beetle and its habitat; riparian zone for wildlife species
2008 Draft ORVs	Riparian and wetland habitats, rare and special-status plant and animal species: willow flycatcher, Sierra Nevada yellow-legged frog, harlequin duck, black swift, & Tompkin's sedge
2010 Draft ORVs	No Biological ORV
Spring 2011 Draft Baseline Conditions Report	Valley oaks ( <i>Quercus lobata</i> ), a regionally rare species, thrive in this area due to its high water table.
2011 Fall Planning Workbook	No Biological ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Valley oaks ( <i>Quercus lobata</i> ), a regionally rare species, occur in the El Portal area.
2013 Draft Comprehensive Management Plan and EIS	No Biological ORV

**Rationale:** Tompkin's sedge and valley elderberry longhorn beetle were removed because they are not river related or dependent. Riverine habitats: riparian woodlands associated with special-status species were removed as they are not rare, unique, or exemplary.

Valley oaks (*Quercus lobata*) were initially added due to public correspondence. In the January 2013 draft environmental impact statement, the valley oaks ORV was removed as valley oaks are widespread across California and the Sierra Nevada foothills and, while commonly located along drainages and in low lying wet areas, are not strictly river related or dependent. The EL Portal stand of valley oaks were determined to not be rare or exemplary as larger specimens of valley oaks occur in the greater Yosemite Region, along the Merced River, downstream of the park and along river tributaries.

#### SEGMENT 4: El Portal (Parkline To El Portal Administrative Site Boundary)

##### Recreational ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	Whitewater boating
1996 Draft Yosemite Valley Housing Plan	Whitewater use (class III to V) and fishing
2000 and 2005 Merced River Plans	Range of river-related rec opportunities, white-water rafting and kayaking (class III to V) and fishing
2008 Draft ORVs	Hiking, backpacking, writing, contemplation, nature study, photography, artistic expression, fishing, camping, and picnicking--create memories, traditions, and bonding
2010 Draft ORVs	No Recreational ORV
Spring 2011 Draft Baseline Conditions Report	The largely natural setting of the rivers provides for memorable active, contemplative, and creative pursuits.
2011 Fall Planning Workbook	No Recreational ORV
2012 Preliminary Concepts Workbook	No Recreational ORV

and Draft Baseline Conditions Report	
2013 Draft Comprehensive Management Plan and EIS	No Recreational ORV

**Rationale:** Recreational ORV in this segment has been removed because the representative activities were not rare, unique, or exemplary.

#### SEGMENT 4: El Portal (Parkline To El Portal Administrative Site Boundary)

##### Scenic ORV

**Rationale:** The Scenic ORV was included in the 2008 *Draft ORVs* but removed as the scenery in this segment was determined not to be unique, rare or exemplary.

#### SEGMENT 4: El Portal (Parkline To El Portal Administrative Site Boundary)

##### Cultural ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	El Portal, old mining town, rail-road exhibit
1996 Draft Yosemite Valley Housing Plan	Native American habitation; 17 archeological sites, including burials, historic structures; logging railroad incline
2000 and 2005 Merced River Plans	Some of the oldest archeological sites in Yosemite, historic Indian villages and gathering places, historic structures related to early tourism and industrial development
2008 Draft ORVs	Trails along Merced for trade and cultural exchange for thousands of years, archeological sites, American Indian spiritual associations
2010 Draft ORVs	Important place of settlement, subsistence, and trade along the River; village sites; some of the oldest archeological deposits in the Sierra foothills (9,500 years), Johnny Wilson Ranch (American Indian Homestead)
Spring 2011 Draft Baseline Conditions Report	With its temperate climate and abundant subsistence resources, El Portal was a crossroads of life and trade, with the river linking the lifeways of peoples from the historic and prehistoric past, both in California and beyond.
2011 Fall Planning Workbook	The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region and the Johnny Wilson Ranch, a regionally rare historic-era American Indian Homestead.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade.
2013 Draft Comprehensive Management Plan and EIS	The El Portal Archeological District contains dense concentrations of resources that represent thousands of years of occupation and evidence of continuous, far-reaching traffic and trade. This segment includes some of the oldest deposits in the region, including the archeological remains of the Johnny Wilson Ranch, a regionally rare historic-era American Indian Homestead.

**Rationale:** Historic structures related to early tourism and industrial development were removed as they are not rare, unique, or exemplary, occurring in many resort areas along rivers in the country. The Johnny Wilson Ranch was added because it is rare, unique, and exemplary. The El Portal Archeological District was identified as a Cultural ORV because it encompasses a complete interrelated landscape of archeological resources that must be managed as a district.

## SEGMENT 5: South Fork Merced River Above Wawona (Headwaters To Top Of Pool At Wawona Impoundment)

### Geologic/Hydrologic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	The South Fork was not included in the 1986 ORVs
1996 Draft Yosemite Valley Housing Plan	V-Shaped canyons due to extremely hard rock, moraine meadows, hot sulphur springs above Gravelly Ford, Paternoster lakes Free-flowing river and pristine water quality
2000 and 2005 Merced River Plans	Glaciated valleys in high country and V-shaped canyons above Wawona; moraine meadows and soda springs above Gravelly Ford are river-related geologic features Free-flowing river and excellent water quality
2008 Draft ORVs	Glacial Processes River gradient drop, rapid snowmelt producing high-volume spring flows
2010 Draft ORVs	No Geologic/Hydrologic ORV
Spring 2011 Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2011 Fall Planning Workbook	No Geologic/Hydrologic ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2013 Draft Comprehensive Management Plan and EIS	No Geologic/Hydrologic ORV

**Rationale:** The glaciated valleys in the high country, and V-shaped canyons above Wawona, and moraine meadows and soda springs above Gravelly Ford were removed as they are not rare, unique, or exemplary. Free-flowing conditions and water quality are established river values.

## SEGMENT 5: South Fork Merced River Above Wawona (Headwaters To Top Of Pool At Wawona Impoundment)

### Biological ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Biological ORV
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1996 Draft Yosemite Valley Housing Plan	Rare wildlife species, including Wawona riffle beetle & mountain yellow-legged frog
2000 and 2005 Merced River Plans	Riverine environments typical of Sierra; examples of special-status species, including Wawona riffle beetle & mountain yellow-legged frog
2008 Draft ORVs	Riparian and wetland habitats, rare and special-status plant and animal species: willow flycatcher, Sierra Nevada yellow-legged frog, harlequin duck, black swift, & Tompkin's sedge
2010 Draft ORVs	Meadows, riparian habitats, depend on annual flooding, 8 of the 9 special status animal species.
Spring 2011 Draft Baseline Conditions Report	No Biological ORV
2011 Fall Planning Workbook	No Biological ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	The Merced River creates numerous, exquisite small meadows and relatively intact adjacent riparian habitats.
2013 Draft Comprehensive Management Plan and EIS	The Merced River sustains numerous small meadows and riparian habitat with high biological integrity.

**Rationale:** Wawona riffle beetle and mountain yellow-legged frog were removed because they are not river related or dependent.

## **SEGMENT 5: South Fork Merced River Above Wawona (Headwaters To Top Of Pool At Wawona Impoundment)**

### **Recreational ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Recreational ORV
1996 Draft Yosemite Valley Housing Plan	Pristine wilderness values; no trails along river
2000 and 2005 Merced River Plan	River-related solitude, enjoyment of natural river sounds, primitive & unconfined recreation; predominantly without trails, except 4 bridgeless trail crossings in the upper segment
2008 Draft ORVs	Hiking, backpacking, writing, contemplation, nature study, photography, artistic expression, fishing, camping, and picnicking--create memories, traditions, and bonding
2010 Draft ORVs	Dramatic scenery, natural sounds, hiking & backpacking, wilderness experiences, solitude, personal reflection, closeness to nature, independence, self-reliance, primitive travel, camping, exploration, & adventure.
Spring 2011 Draft Baseline Conditions Report	The Merced River, spectacular High Sierra landscape, dramatic scenery, natural sounds, and abundant opportunities for solitude combine to produce a variety of exceptional wilderness-oriented recreational activities.
2011 Fall Planning Workbook	No Recreational ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Recreational ORV
2013 Draft Comprehensive Management Plan and EIS	No Recreational ORV

**Rationale:** The recreational ORV in this segment has been removed because the representative activities were not rare, unique, or exemplary.

## SEGMENT 5: South Fork Merced River Above Wawona (Headwaters To Top Of Pool At Wawona Impoundment)

### Scenic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Scenic ORV
1996 Draft Yosemite Valley Housing Plan	Views of Triple Divide Peak and Sierra Crest
2000 & 2005 Merced River Plan	Views of unique river features: large pothole pools in slick rock cascades, old growth forest, and meadows
2008 Draft ORVs	Seasonal and daily changes, lighting on granite walls, domes, meadows, calm water, rushing cascades, scenic experience encourages interpretation and education
2010 Draft ORVs	Largely inaccessible; few trail crossings; unspoiled Sierra Nevada river valley views dominated by forest-cloaked hills, distant peaks, and an untamed river; some of the wildest views possible in the Sierra Nevada.
Spring 2011 Draft Baseline Conditions Report	Passing through an untrammelled forested wilderness, the South Fork Merced River forms the centerpiece of some of the Sierra's wildest scenery.
2011 Fall Planning Workbook	The South Fork Merced River passes through a vast area of natural scenic beauty.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	The South Fork Merced River passes through a vast area of exemplary and wild scenic beauty.

**Rationale:** This ORV has remained generally consistent over time.

## SEGMENT 5: South Fork Merced River Above Wawona (Headwaters To Top Of Pool At Wawona Impoundment)

### Cultural ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Cultural ORV
1996 Draft Yosemite Valley Housing Plan	Archeological sites and historical properties; large expanse of wilderness



2000 and 2005 Merced River Plan	River-related prehistoric sites and resources; historic stock use and cavalry activities
2008 Draft ORVs	Trails along Merced for trade and cultural exchange for thousands of years, archeological sites, American Indian spiritual associations
2010 Draft ORVs	Finding seasonal trade, travel, and subsistence opportunities along the South Fork Merced, Native Americans left behind regionally rare rock ring features with wooden remains.
Spring 2011 Draft Baseline Conditions Report	Finding seasonal trade, travel, and subsistence opportunities along the South Fork Merced, American Indians left behind regionally rare, prehistoric rock-ring features with wooden remains.
2011 Fall Planning Workbook	The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade.  The South Fork of the Merced River includes regionally rare evidence of indigenous settlement including prehistoric rock ring features with wooden remains.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade.  This segment includes regionally rare evidence of indigenous settlement along the South Fork Merced River, including prehistoric rock ring features with wooden remains.
2013 Draft Comprehensive Management Plan and EIS	The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade.  This segment includes regionally rare archeological features representing indigenous settlement and use along the South Fork Merced River at archeological sites with rock ring features.

**Rationale:** Historic stock use and cavalry activities were removed because they are not river related or dependent, nor are they rare, unique, or exemplary.

The term American Indian is the preferred term.

It was specified that the rare rock ring features are prehistoric.

The Wawona Archeological District was added because it encompasses a complete interrelated landscape of archeological resources that must be managed as a district. This district spans Segments 5-8.

## **SEGMENT 6: Wawona Impoundment (Top Of Pool At Wawona Impoundment To 200 Feet Below Dam)**

### **Geologic/Hydrologic ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	The South Fork was not included in the 1986 ORVs
1996 Draft Yosemite Valley Housing Plan	Excellent water quality

2000 and 2005 Merced River Plans	Same as 1996
2008 Draft ORVs	No Geologic/Hydrologic ORV
2010 Draft ORVs	No Geologic/Hydrologic ORV
Spring 2011 Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2011 Fall Planning Workbook	No Geologic/Hydrologic ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2013 Draft Comprehensive Management Plan and EIS	No Geologic/Hydrologic ORV

**Rationale:** Water quality was removed as it is an established river value.

## **SEGMENT 6: Wawona Impoundment (Top Of Pool At Wawona Impoundment To 200 Feet Below Dam)**

### **Recreational ORV**

**Rationale:** Sightseeing, fishing, photography, and hiking were included as an ORV in 1996 *Draft Yosemite Valley Housing Plan* but removed from subsequent drafts as these recreational activities are not strictly river related or dependent.

## **SEGMENT 6: Wawona Impoundment, Top Of Pool At Wawona Impoundment To 200 Feet Below Dam**

### **Scenic ORV**

**Rationale:** Views of the river and Wawona Dome were included as an ORV in the 1996 Draft Yosemite Valley Plan but removed because they were determined not to be rare, unique or exemplary.

## **SEGMENT 6: Wawona Impoundment (Top Of Pool At Wawona Impoundment To 200 Feet Below Dam)**

### **Cultural ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Cultural ORV
1996 Draft Yosemite Valley Housing Plan	Archeological sites and historic properties

2000 & 2005 Merced River Plan	No Cultural ORV
2008 Draft ORVs	No Cultural ORV
2010 Draft ORVs	No Cultural ORV
Spring 2011 Draft Baseline Conditions Report	No Cultural ORV
2011 Fall Planning Workbook	The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** The Wawona Archeological District was added as an independent ORV because it encompasses a complete interrelated landscape of archeological resources that must be managed as a district. This district spans Segments 5-8.

## SEGMENT 7: Wawona (200 Feet Below Dam Wawona Impoundment To Squirrel Creek)

### Geologic/Hydrologic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	The South Fork was not included in the 1986 ORVs
1996 Draft Yosemite Valley Housing Plan	Moraines; geomorphology of Wawona Meadow; Wawona Dome Excellent water quality
2000 and 2005 Merced River Plan	Excellent water quality
2008 Draft ORVs	Glacial Processes Low gradient slows river, rapid snowmelt producing high-volume spring flows
2010 Draft ORVs	No Geologic/Hydrologic ORV
Spring 2011 Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2011 Fall Planning Workbook	No Geologic/Hydrologic ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2013 Draft Comprehensive Management Plan and EIS	No Geologic/Hydrologic ORV

**Rationale:** ORV was removed as water quality is an established river value. Low-gradient and high-volume spring flows are not rare, unique, or exemplary.

**SEGMENT 7: Wawona (200 Feet Below Dam Wawona Impoundment To Squirrel Creek)****Biological ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Biological ORV
1996 Draft Yosemite Valley Housing Plan	Rare wildlife species and rare plant species listed (including <i>Myrica hartwegii</i> ); Wawona Meadow rare—threatened plant community in California, contains high species diversity, wetlands, & specialized habitats
2000 and 2005 Merced River Plans	Diversity of river-related species, wetlands, and riparian habitats; Special status species, including Wawona riffle beetle
2008 Draft ORVs	Riparian and wetland habitats, rare and special-status plant and animal species: willow flycatcher, Sierra Nevada yellow-legged frog, harlequin duck, black swift, & Tompkin's sedge
2010 Draft ORVs	Sierra sweet bay ( <i>Myrica hartwegii</i> ), a rare plant found exclusively on river banks in the central Sierra, occurs along the South Fork in this segment
Spring 2011 Draft Baseline Conditions Report	Same as 2010
2011 Fall Planning Workbook	The Sierra sweet bay ( <i>Myrica hartwegii</i> ) is a rare plant found along the South Fork Merced River.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** Diversity of river-related species, wetlands, and riparian habitats were removed as they are not rare, unique, or exemplary, with the exception of *Myrica hartwegii*. Special-status species, including Wawona riffle beetle, were removed because they are not river related or dependent.

**SEGMENT 7: Wawona (200 Feet Below Dam Wawona Impoundment To Squirrel Creek)****Recreational ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Recreational ORV
1996 Draft Yosemite Valley Housing Plan	Hiking, picnicking, camping, skiing, fishing, photography, swimming, nature study, horseback riding, biking, sightseeing, and boating
2000 and 2005 Merced River Plans	Opportunities to experience a spectrum of river-related recreational activities, from nature study and photography to hiking
2008 Draft ORVs	Hiking, backpacking, writing, contemplation, nature study, photography, artistic expression, fishing, camping, and picnicking--create memories, traditions, and bonding
2010 Draft ORVs	Largely natural setting allowing visitors to easily connect with river; several pools and beaches; swimming, relaxing, and fishing; camping allows visitors to be close to river overnight

Spring 2011 Draft Baseline Conditions Report	The largely natural setting of the rivers provides for memorable active, contemplative, and creative pursuits.
2011 Fall Planning Workbook	No Recreational ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Recreational ORV
2013 Draft Comprehensive Management Plan and EIS	No Recreational ORV

**Rationale:** The recreational ORV in this segment has been removed because the representative activities were not rare, unique, or exemplary.

## **SEGMENT 7: Wawona (200 Feet Below Dam Wawona Impoundment To Squirrel Creek)**

### **Scenic ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Scenic ORV
1996 Draft Yosemite Valley Housing Plan	Views of Wawona Dome; the free-flowing river; historic vistas; view of confluence and cascades of Chilnualna Creek; confluence of Big Creek
2000 and 2005 Merced River Plans	Views of Wawona Dome
2008 Draft ORVs	Seasonal and daily changes, lighting on granite walls, domes, meadows, calm water, rushing cascades, scenic experience encourages interpretation and education
2010 Draft ORVs	No Scenic ORV
Spring 2011 Draft Baseline Conditions Report	No Scenic ORV
2011 Fall Planning Workbook	No Scenic ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Scenic ORV
2013 Draft Comprehensive Management Plan and EIS	No Scenic ORV

**Rationale:** Views of Wawona Dome were removed as they are not rare, unique, or exemplary.

## **SEGMENT 7: Wawona (200 Feet Below Dam Wawona Impoundment To Squirrel Creek)**

### **Cultural ORV**

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Cultural ORV
1996 Draft Yosemite Valley Housing Plan	Over 60 prehistoric and historic archeology sites, traditional plant gathering; historic structures: Wawona hotel, pioneer historic center, Galen Clark homestead, Stella Lake; historic sites in Wawona Meadow

*Comparison of Merced River ORVs Over Time (1986-present)*

2000 and 2005 Merced River Plans	Thousands of years of human occupation, including numerous prehistoric and historic Indian villages; historic sites, structures, and landscape features related to tourism, early Army and NPS admin, and homesteading
2008 Draft ORVs	Trails along Merced for trade and cultural exchange for thousands of years, archeological sites, American Indian spiritual associations; covered bridge built by Galen Clark in 1868 as an open truss span (covered in 1875)
2010 Draft ORVs	Flowing through a broad basin, the South Fork Merced provided the water and location necessary for prehistoric settlements, for the African-American buffalo soldiers, and for more recent settlers, who left behind evidence of far-reaching traffic and trade, significant archeological sites, and one of very few covered bridges in the region.
Spring 2011 Draft Baseline Conditions Report	<p>With its year-round water and level terrain for settlement, the Wawona Archeological District is composed of dense clusters of historic and prehistoric river-related sites that provide evidence of far-reaching traffic and trade.</p> <p>Physical remnants of U.S. Army Cavalry Camp A. E. Wood document the unique Yosemite legacy of the African-American Buffalo Soldiers, who founded their camps near the river's strategic water source and related ecological habitat.</p> <p>Built to connect human developments on both sides of the South Fork Merced River, the Wawona Covered Bridge is one of only a few covered bridges in the region.</p>
2011 Fall Planning Workbook	<p>The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade.</p> <p>In this segment, remains of the U.S. Army Cavalry Camp A. E. Wood document the unique Yosemite legacy of the African-American Buffalo Soldiers and the strategic placement of their camp near the Merced River.</p> <p>The Wawona Covered Bridge is one of the few covered bridges in the region.</p>
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	<p>The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including unusually rich evidence of continuous, far-reaching traffic and trade. In this segment, remains of the U.S. Army Cavalry Camp A.E. Wood document the unique Yosemite legacy of the African-American Buffalo Solider and the strategic placement of their camp near the Merced River.</p> <p>The Wawona Historic Resources ORV includes one of the few covered bridges in the region and the National Historic Landmark Wawona Hotel complex. The Wawona Hotel complex is the largest existing Victorian hotel complex within the boundaries of a national park, and one of the few remaining in the United States with this high level of integrity.</p>

**Rationale:** The Wawona Archeological District was added as an independent ORV because it encompasses a complete interrelated landscape of archeological resources that must be managed as a district. This district spans Segments 5-8. Camp A.E. Wood was added as an independent ORV because it represents a specific archeological resource that merits protection under this plan.

## SEGMENT 8: South Fork Merced River Below Wawona (Squirrel Creek To Western Park Boundary)

### Geologic/Hydrologic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	The South Fork was not included in the 1986 ORVs
1996 Draft Yosemite Valley Housing Plan	Transition from glaciated to un-glaciated canyon Continual whitewater cascades and excellent water quality
2000 and 2005 Merced River Plans	Transition from Paleozoic Era igneous to Cretaceous Period meta-sedimentary rock (among oldest in Sierra) Free-flowing river with continual white-water cascades
2008 Draft ORVs	Glacial processes White water cascades in a deep, narrow canyon through a wild environment; rock fall-driven morphology resulting in deposition of enormous boulders, rapid snowmelt producing high-volume spring flows
2010 Draft ORVs	No Geologic/Hydrologic ORV
Spring 2011 Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2011 Fall Planning Workbook	No Geologic/Hydrologic ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Geologic/Hydrologic ORV
2013 Draft Comprehensive Management Plan and EIS	No Geologic/Hydrologic ORV

**Rationale:** Transition from Paleozoic Era igneous to Cretaceous Period metasedimentary rock (among oldest in Sierra) was removed as it is not rare, unique, or exemplary. Free-flowing condition is an established river value. Additionally, white water cascades are not rare, unique or exemplary.

## SEGMENT 8: South Fork Merced River Below Wawona (Squirrel Creek To Western Park Boundary)

### Biological ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Biological ORV
1996 Draft Yosemite Valley Housing Plan	Rare plant species listed (but not <i>Myrica hartwegii</i> ); rare wildlife species, including Wawona riffle beetle and rainbow trout
2000 and 2005 Merced River Plans	Diverse riparian areas that are intact and undisturbed by humans; special-status species, including Wawona riffle beetle
2008 Draft ORVs	Riparian and wetland habitats, rare and special-status plant and animal species: willow flycatcher, Sierra Nevada yellow-legged frog, harlequin duck, black swift, and Tompkin's sedge
2010 Draft ORVs	Sierra sweet bay ( <i>Myrica hartwegii</i> ), a rare plant found exclusively on river

	banks in the central Sierra, occurs along the South Fork in these segments.
Spring 2011 Draft Baseline Conditions Report	Same as 2010
2011 Fall Planning Workbook	The Sierra sweet bay ( <i>Myrica hartwegii</i> ), is a rare plant found along the South Fork Merced River.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** *Myrica hartwegii* was added because it is rare and river-dependent, found on the S. Fork river banks and those of a few other streams in the Sierra. Wawona riffle beetle was removed because it is not river related or dependent.

## SEGMENT 8: South Fork Merced River Below Wawona (Squirrel Creek To Western Park Boundary)

### Recreational ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Recreational ORV
1996 Draft Yosemite Valley Housing Plan	Fishing and wilderness inaccessibility and solitude
2000 and 2005 Merced River Plans	Outstanding opportunities for river-related solitude, enjoyment of natural river sounds, primitive & unconfined recreation in an untrailed, undisturbed environment; river related recreation includes hiking, fishing, & white-water kayaking.
2008 Draft ORVs	Hiking, backpacking, writing, contemplation, nature study, photography, artistic expression, fishing, camping, and picnicking--create memories, traditions, and bonding.
2010 Draft ORVs	Hiking and backpacking, wilderness experiences, solitude, personal reflection, closeness to nature, independence, self-reliance, primitive travel, camping, exploration, & adventure; off-trail hiking and class V kayaking.
Spring 2011 Draft Baseline Conditions Report	The Merced River, spectacular High Sierra landscape, dramatic scenery, natural sounds, and abundant opportunities for solitude combine to produce a variety of exceptional wilderness-oriented recreational activities.
2011 Fall Planning Workbook	No Recreational ORV
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	No Recreational ORV
2013 Draft Comprehensive Management Plan and EIS	No Recreational ORV

**Rationale:** The Recreation ORV was removed from this segment because the representative activities were not rare, unique, or exemplary.



## SEGMENT 8: South Fork Merced River Below Wawona (Squirrel Creek To Western Park Boundary)

### Scenic ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Scenic ORV
1996 Draft Yosemite Valley Housing Plan	Views of continual whitewater cascades in a deep and narrow canyon
2000 and 2005 Merced River Plans	Views of continual white-water cascades in the deep and narrow river canyon in untrailed, undisturbed environment
2008 Draft ORVs	Seasonal and daily changes, calm water, rushing cascades, scenic experience encourages interpretation and education
2010 Draft ORVs	Largely inaccessible; no trail crossings; unspoiled Sierra Nevada river valley views dominated by forest-cloaked hills, distant peaks, and an untamed river; some of the wildest views possible in the Sierra Nevada.
Spring 2011 Draft Baseline Conditions Report	Passing through an untrammeled forested wilderness, the South Fork Merced River forms the centerpiece of some of the Sierra's wildest scenery.
2011 Fall Planning Workbook	The South Fork Merced River passes through a vast area of exemplary and wild scenic beauty.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** Views of continual white-water cascades in the deep and narrow river canyon in untrailed, undisturbed environment were removed because they are not rare, unique, or exemplary. The ORV was revised to include the overall scenic beauty of this segment of the river.

## SEGMENT 8: South Fork Merced River Below Wawona (Squirrel Creek To Western Park Boundary)

### Cultural ORV

1986 Sierra National Forest Draft Forest Land and Resource Management Plan	No Cultural ORV
1996 Draft Yosemite Valley Housing Plan	Archeological sites and historic properties
2000 and 2005 Merced River Plans	Archeological sites and historic resources such as trail segments representing early cavalry activity
2008 Draft ORVs	Trails along Merced for trade and cultural exchange for thousands of years, archeological sites, American Indian spiritual associations
2010 Draft ORVs	No Cultural ORV

Spring 2011 Draft Baseline Conditions Report	No Cultural ORV
2011 Fall Planning Workbook	The Wawona Archeological District encompasses numerous clusters of resources spanning thousands of years of occupation, including evidence of continuous, far-reaching traffic and trade.
2012 Preliminary Concepts Workbook and Draft Baseline Conditions Report	Same as fall 2011
2013 Draft Comprehensive Management Plan and EIS	Same as 2012

**Rationale:** This ORV was revised to include the entire Wawona Archeological District.

## SEGMENTS 1-8

### Air Quality and Scientific Resource ORVs

**Rationale:** Air Quality was included as an ORV in the *1996 Draft Yosemite Valley Housing Plan* and was removed as it was determined to be inconsistent with Interagency Council criteria and not strictly river related or river dependent. The Scientific Resource ORV, also included in the 1996 housing plan and the 2000, and 2005 draft Merced River plans, was removed. It was determined that this ORV was vague and non-specific. Science is inherent to other specific values.

\* The 2008 *Draft ORVs* were formulated under a "corridorwide" scale. Examples were cited but not intended to be all inclusive

**APPENDIX N**

**DRAFT BIOLOGICAL ASSESSMENT**

**APPENDIX N**  
**BIOLOGICAL ASSESSMENT**

Biological Assessment on the  
Merced River Plan/DEIS

National Park Service  
Department of the Interior  
November 2012

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## CHAPTER I. INTRODUCTION

### Purpose and Need

The National Park Service in Yosemite has prepared the *Merced Wild and Scenic River Comprehensive Management Plan/Draft Environmental Impact Statement (Merced River Plan/DEIS)* to provide a comprehensive management plan for the protection of the Merced River's free-flowing condition, water quality, and the values that make the river worthy of designation. The purpose of this Biological Assessment is to review the *Merced River Plan /DEIS* in sufficient detail to determine effects of the plan on federal and state-listed threatened or endangered species, federal and state species of concern, state-listed rare species, and species that are locally rare or threatened. All of these species are also referred to as special-status species throughout this document.

The *Merced River Plan/DEIS* aims to protect and further restore degraded areas of the river to its natural free-flowing condition and encourage resource-based recreational and educational opportunities along the river corridor. The plan would contribute to subsequent planning that would manage crowding through careful design, relocation, or removal of specific facilities and by setting use limits, dispersing visitor impacts, and establishing other measures to protect river resources and the diversity of visitor experiences. The plan also proposes to reduce traffic congestion by identifying optimal road locations and facilities, parking areas, turnouts, and other transportation facilities in the river corridor. Many of these functions would move to the El Portal Administrative Site on the western boundary of the park.

This Biological Assessment will evaluate the Preferred Alternative in the *Merced River Plan/DEIS*, Alternative 5. The areas that could be affected by the Preferred Alternative include East and West Yosemite Valley, Wawona, Merced Lake High Sierra Camp, El Portal and Old El Portal. These areas are designated as the project area. Detailed maps of the project area are available in Vol. I, *Merced River Plan/DEIS*.

This Biological Assessment will:

- Evaluate and document the effects of the Preferred Alternative on special-status species or their critical habitat that are known to be or could be present within the project area
- Determine the need for consultation and conference with the U.S. Fish and Wildlife Service (USFWS)
- Conform to requirements of the Endangered Species Act (19 USC 1536 [c], 50 CFR 402) and the National Environmental Policy Act (42 USC 4321 et seq., implemented at 40 CFR Parts 1500-1508)



## U.S. Fish and Wildlife Service Consultation

The Endangered Species Act (Section 7 [a][2]) directs federal agencies to consult with the responsible agency (in this case, the USFWS) to determine whether proposed actions are likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat. The NPS initiated informal consultation with the USFWS and obtained an updated species list from the USFWS on October 18, 2012. NPS obtained lists of federally listed endangered or threatened species within the Mount Lyell, Merced Peak, Sing Peak, Timber Know, Half Dome, El Capitan, Wawona, Mariposa Grove, El Portal, and Kinsley U.S. Geological Survey quadrangles that may be present or may be affected by actions proposed in the *Merced River Plan/DEIS*. Based on these lists and professional judgment by the park staff, seven federally listed threatened, endangered, proposed, or candidate species have been identified as known to occur or as having the potential to occur in the study area: one invertebrate species, two amphibian species, and three mammal species, and one plant species (see table N-1). Consultation with the USFWS will continue throughout the environmental compliance process for the Merced River Plan, and the NPS will consult with the USFWS to obtain an updated list of federally endangered or threatened species prior to project implementation.

Other species considered in this biological assessment include species identified by the California Department of Fish and Game (CDFG) as endangered, threatened, or a candidate species; and CDFG species of concern, rare species, or fully protected species. Additionally, species considered rare by the National Park Service are also included in this biological assessment. Based on these lists, previous studies, recent surveys, and professional judgment by the park staff, 33 special status wildlife species are known to occur or have the potential to occur in the study area: one invertebrate species (beetle), one fish species, three amphibian species, 14 bird species, and 14 mammal species.

Botanical surveys have identified one federal candidate plant species and two state-listed plants within the Merced River corridor in Yosemite. Therefore, for purposes of this analysis, special status plant species generally include mainly those species identified as such by the park. Park-designated sensitive plant species are those that have (1) extremely limited distributions in the park and may represent relict populations from past climatic or topographic conditions; or (2) may be at the extreme extent of their range in the park or represent changes in species genetics. These species may be included on lists such as the CNPS Inventory of Rare and Endangered Plants. 50 special status plant species are known to occur or have the potential to occur in the study area.

## Species Evaluated in this Biological Assessment

### *Federally Listed Species*

The Endangered Species Act defines an endangered species as any species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Of the Federally listed species that could be affected by the *Merced River Plan/DEIS*, one is endangered: Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*); and one is threatened: Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*).

**TABLE N-1: SPECIES CONSIDERED IN THIS BIOLOGICAL ASSESSMENT**

Federal Threatened Species
<b>Invertebrates</b>
Valley elderberry longhorn beetle ( <i>Desmocerus californicus dimorphus</i> )
Federal Candidate Species
<b>Mammals</b>
Pacific fisher ( <i>Martes pennanti pacifica</i> )
<b>Reptiles and Amphibians</b>
Yosemite toad ( <i>Bufo canorus</i> )
Sierra Nevada yellow-legged frog ( <i>Rana sierrae</i> )
<b>Plants</b>
Whitebark pine ( <i>Pinus albicaulis</i> )
California State Endangered Species
<b>Birds</b>
Willow flycatcher ( <i>Empidonax traillii</i> )
Bald eagle ( <i>Haliaeetus leucocephalus</i> )
<b>Mammals</b>
Sierra Nevada bighorn sheep ( <i>Ovis canadensis sierrae</i> )
California State Threatened Species
<b>Mammals</b>
California wolverine ( <i>Gulo gulo</i> )
Sierra Nevada red fox ( <i>Vulpes vulpes necator</i> )
California State Fully Protected Species
<b>Birds</b>
Golden eagle ( <i>Aquila chrysaetos</i> )
Peregrine Falcon ( <i>Falco peregrinus</i> )
Bald eagle ( <i>Haliaeetus leucocephalus</i> )
California State Rare Species
<b>Plants</b>
Thompkins' sedge ( <i>Carex tompkinsii</i> )
Congdon's woolly-sunflower ( <i>Eriophyllum congdonii</i> )
Congdon's lewisia ( <i>Lewisia congdonii</i> )
California State Species of Special Concern
<b>Birds</b>
Northern goshawk ( <i>Accipiter gentilis</i> )
Long-eared owl ( <i>Asio otus</i> )
Vaux's swift ( <i>Chaetura vauxi</i> )
Northern harrier ( <i>Circus cyaneus</i> )
Olive-sided flycatcher ( <i>Contopus cooperi</i> )
Black swift ( <i>Cypseloides niger</i> )
Yellow warbler ( <i>Setophaga petechia</i> )
Harlequin duck ( <i>Histrionicus histrionicus</i> )
Great gray owl ( <i>Strix nebulosa</i> )
California spotted owl ( <i>Strix occidentalis occidentalis</i> )

**TABLE N-1: SPECIES CONSIDERED IN THIS BIOLOGICAL ASSESSMENT (CONTINUED)**

## California State Species of Special Concern (cont.)

**Fish**Hardhead (*Mylopharodon conocephalus*)**Mammals**Pallid bat (*Antrozous pallidus*)Sierra Nevada mountain beaver (*Aplodontia rufa californica*)Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)Spotted bat (*Euderma maculatum*)Greater western mastiff bat (*Eumops perotis californicus*)Western red bat (*Lasiurus blossevillei*)Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*)Western white-tailed jackrabbit (*Lepus townsendii townsendii*)Pacific fisher (*Martes pennanti pacifica*)Mount Lyell shrew (*Sorex lyellii*)American badger (*Taxidea taxus*)**Reptiles and Amphibians**Yosemite toad (*Bufo canorus*)Western pond turtle (*Emys marmorata*\*)Mount Lyell salamander (*Hydromantes platycephalus*)Foothill yellow-legged frog (*Rana boylei*)Sierra Nevada yellow-legged frog (*Rana sierrae*)

## Park Rare Species

**Plants**Spurred snapdragon (*Antirrhinum leptaleum*)Lemmon's wild ginger (*Asarum lemmonii*)California bolandra (*Bolandra californica*)Threadleaf beakseed (*Bulbostylis capillaris*)Mono Hot Spring evening primrose (*Camissonia sierrae* ssp. *alticola*)Sierra suncup (*Camissonia sierrae* ssp. *sierrae*)Buxbaum's sedge (*Carex buxbaumii*)Silvery sedge (*Carex canescens*)Cleft sedge (*Carex fissuricola*)Yosemite sedge (*Carex sartwelliana*)Thompkins' sedge (*Carex tompkinsii*)Bolander's woodreed (*Cinna bolanderi*)Narrow leaf collinsia (*Collinsia linearis*)Short-bracted bird's beak (*Cordylanthus rigidus* ssp. *brevibracteus*)Mountain lady's slipper (*Cypripedium montanum*)Stream orchid (*Epipactis gigantea*)Congdon's wooly sunflower (*Eriophyllum congdonii*)Purple fawn-lily (*Erythronium purpurascens*)Northern mannagrass (*Glyceria borealis*)California sunflower (*Helianthus californicus*)Common mare's tail (*Hippuris vulgaris*)Redray alpinegold (*Hulsea heterochroma*)Western quillwort (*Isoetes occidentalis*)Sierra laurel (*Leucothoe davisiae*)Congdon's lewisia (*Lewisia congdonii*)False pimpernel (*Lindernia dubia* var. *anagallidea*)Tanoak (*Lithocarpus densiflorus* var. *echinoides*)Northern bugleweed (*Lycopus uniflorus*)Yellow and white monkeyflower (*Mimulus bicolor*)Inconspicuous monkeyflower (*Mimulus inconspicuus*)Cutleaf monkeyflower (*Mimulus laciniatus*)

**TABLE N-1: SPECIES CONSIDERED IN THIS BIOLOGICAL ASSESSMENT (CONTINUED)**

<p>Park Rare Species (cont.)</p> <p>Pansy monkeyflower (<i>Mimulus pulchellus</i>)</p> <p>Sierra sweet-bay (<i>Myrica hartwegii</i>)</p> <p>California bog asphodel (<i>Narthecium californicum</i>)</p> <p>Azure penstemon (<i>Penstemon azureus</i> ssp. <i>angustissimus</i>)</p> <p>Purdy's foothill penstemon (<i>Penstemon heterophyllus</i> var. <i>purdyi</i>)</p> <p>Tansy leafed phacelia (<i>Phacelia tanacetifolia</i>)</p> <p>Coleman's piperia (<i>Piperia colemanii</i>)</p> <p>Torrey's popcornflower (<i>Plagiobothrys torreyi</i> var. <i>torreyi</i>)</p> <p>Nuttall's pondweed (<i>Potamogeton epihydrus</i> ssp. <i>nuttallii</i>)</p> <p>Valley oak (<i>Quercus lobata</i>)</p> <p>Wood saxifrage (<i>Saxifraga mertensiana</i>)</p> <p>Oregon saxifrage (<i>Saxifraga oregana</i>)</p> <p>Bolander's skullcap (<i>Scutellaria bolanderi</i>)</p> <p>Clark's ragwort (<i>Senecio clarkianus</i>)</p> <p>Small bur reed (<i>Sparganium natans</i>)</p> <p>Sierra bladdernut (<i>Staphylea bolanderi</i>)</p> <p>Narrowleaf wakerobin (<i>Trillium angustipetalum</i>)</p> <p>California red huckleberry (<i>Vaccinium parvifolium</i>)</p> <p>Hall's wyethia (<i>Wyethia elata</i>)</p>
<p>*Believed to be extirpated from the Merced River corridor.</p>

The Sierra Nevada bighorn sheep formerly ranged throughout the high elevations of the Sierra Nevada. By the beginning to the 20th century, however, their numbers had been decimated by overhunting, competition for forage with domestic sheep, and especially by diseases contracted from domestic sheep. By 1999, fewer than 200 Sierra Nevada bighorn sheep were left in the entire range, prompting its listing that year as endangered. Currently, the Sierra Nevada bighorn sheep occurs primarily along the Sierra Crest in the northeast portion of Yosemite Park. Most of the herd inhabits Forest Service land adjacent to the park.

The Valley elderberry longhorn beetle was listed by the USFWS as threatened on August 8, 1980. This listing was primarily a result of destruction of riparian habitat in the San Joaquin Valley that removed the beetle's host plant, the elderberry (*Sambucus* sp.). Critical habitat has been designated for the beetle in two areas: along the American River near the Sacramento metropolitan area and along Putah Creek in Solano County. However, the beetle also occurs up to 3,000 feet in elevation in the Sierra Nevada.

### ***Special-Status Species***

Special-status species that could be affected by this plan are listed in table N-1. There are 50 special status plant species and 33 special status wildlife species known to occur or having the potential to occur within Yosemite National Park's Merced River corridor. The species on this list include the federally listed species in the ten U.S. Geological Survey quadrangles that encompass the project area for the plan (see USFWS Consultation), species listed in the California Natural Diversity Data Base, and "park rare" plants identified by National Park Service. Park rare plants include those that are:

- locally rare natives

- listed by the California Native Plant Society
- endemic to the park or local vicinity
- at the furthest extent of their range
- of special importance to the park (identified in legislation or park management objectives)
- the subject of political concern or unusual public interest
- vulnerable to local population declines
- subject to human disturbance during critical portions of their life cycle

There is no classification of “park rare” for any wildlife species.

### Species Removed from Further Analysis

The following species are on the list of “Endangered and Threatened Species that may occur or be Affected by Projects in the USFWS 7 ½ Minute Quads” that was provided by the USFWS. However, the National Park Service has determined that they would not be affected by the *Merced River Plan/DEIS* because they do not occur in the project area nor were they historically found in the project area. Therefore, there is no effect on these species from the Preferred Alternative in the *Yosemite Valley Plan/DEIS*, nor are they potentially indirectly or cumulatively affected by the Preferred Alternative. These species will not be evaluated further in this Biological Assessment.

- Delta smelt, *Hypomesus transpacificus* (Federal Threatened)
- Lahontan cutthroat trout, *Oncorhynchus* (=Salmo) *clarki henshawi* (Federal Threatened)
- Paiute cutthroat trout, *Oncorhynchus* (=Salmo) *clarki seleniris* (Federal Threatened)
- Central Valley steelhead, *Oncorhynchus mykiss* (Federal Threatened)
- California red-legged frog, *Rana draytonii* (Federal Threatened)

### Critical Habitat

Critical habitat is a specific area or type of area that is considered to be essential for the survival of a species, as designated by the USFWS under the Endangered Species Act. No critical habitat occurs in Yosemite National Park or the El Portal Administrative Site.

## CHAPTER II. CURRENT MANAGEMENT DIRECTION

### Authorities

The following legislation and policies address the management of special-status species in the park: the National Park Service Organic Act, the Endangered Species Act, the National Environmental Quality Act, the California Endangered Species Act, the Migratory Bird Conservation Act, the Fish and Wildlife Coordination Act, the Wild and Scenic Rivers Act, and the Wilderness Act.

The USFWS normally takes the lead departmental responsibility of coordinating and implementing provisions of the Federal Endangered Species Act for all listed endangered, threatened, and candidate species. This Biological Assessment is prepared in accordance with Section 7 of the Federal Endangered Species Act of 1973, as amended, as part of the consultation process with the USFWS.

### Policy and Program Objectives

The following National Park Service policies and program objectives prescribe the management of special-status species:

- The *Natural Resources Management Guideline* NPS-77 (1991) states:  
“Management affects the distribution, abundance, and ecological relationships of and among species. Whereas preservation can be accomplished by a zoo, botanical garden, or other non-natural refugium, the National Park Service’s goal is the long-term preservation of species and their ecological role and function as part of a “natural ecosystem.” It is, therefore, critical that ecological aspects of management prevail in dealing with threatened and endangered species. An understanding of factors limiting the distribution and abundance of the species of concern must be well understood and incorporated into any management action.”
- National Park Service *Management Policies* (1988) states:  
“Consistent with the purposes of the Endangered Species Act (16 USC 1531 et seq.), the National Park Service will identify and promote the conservation of all federally listed threatened, endangered, or candidate species within park boundaries and their critical habitats.”  
  
“The National Park Service also will identify all state and locally listed threatened, endangered, rare, declining, sensitive, or candidate species that are native to and present in the parks, and their critical habitats. These species and their critical habitats will be considered in National Park Service planning activities.”
- The 1980 *General Management Plan* for Yosemite states:  
“Protect threatened and endangered plant and animal species and reintroduce, where practical, those species eliminated from the natural ecosystems.”

## CHAPTER III. THE MERCED RIVER PLAN/DEIS

### **The Preferred Alternative – Enhanced Visitor Experiences and Essential Riverbank Restoration**

The Preferred Alternative of the *Merced River Plan/DEIS* would include significant restoration within 100 feet of the river and in meadow and riparian areas, maintaining daily visitation in Yosemite Valley to accommodate the same peak levels observed in recent years, reducing unnecessary facilities and services, and converting facilities from administrative use to public use where feasible. This alternative would restore approximately 203 acres of currently disturbed or developed habitats throughout the Merced River corridor to natural conditions by removing infrastructure and development from sensitive areas such as meadows, riparian habitat, and riverbanks. Much of the development within 100 feet from the ordinary high water mark of the Merced River would be removed under this alternative. 6,135 linear feet of riprap would be removed from the banks of the Merced River. Targeted infrastructure within the bed and banks of the river would be removed. Sugar Pine Bridge would be removed to promote free-flowing conditions of the river and channel complexity would be enhanced below other bridges. Restoration actions also include filling ditches and removing informal trails from meadows to improve hydrology and reduce meadow fragmentation. Collectively, these actions would enhance meadow and floodplain connectivity and the free-flowing condition of the river.

Actions to manage visitor use and facilities under Alternative 5, specifically those concerning vehicle access and overnight accommodations, would result in a 2% increase in lodging accommodations. The campsite inventory would increase by 29% in the Merced River corridor and 37% in Yosemite Valley. All campsites within 100 feet of the river would be removed. Campsite losses would be offset with the addition of new camping adjacent to Upper Pines Campground and east of the Camp 4 Campground, as well as new sites west of Backpackers Campground, in the former Upper Rivers Campground area, and east of El Capitan Picnic Area at Eagle Creek. Under Alternative 5, there would be a net increase of 13% in Yosemite Valley overnight use. This would largely result from the increase in units at Curry Village. Management actions related to lodging would focus on removing lodging from the ordinary high water mark and Housekeeping Camp, and slightly reducing lodging in wilderness. Tent cabins in the Boys Town area would be replaced with hard-sided lodging in Curry Village to increase the availability of year-round accommodations.

Alternative 5 would restore approximately 203 acres of vegetation, including 40.52 acres of wetlands, as a result of actions common to Alternatives 2-6 in conjunction with actions specific to Alternative 5. Actions to manage visitor use and facilities would result in the loss of approximately 36.89 acres of vegetation and 2.67 acres of wetlands as a result of actions specific to Alternative 5.

For a detailed description of the Preferred Alternative, refer to Vol. I, Chapter 9 of the *Merced River Plan/DEIS* (NPS 2012).

## CHAPTER IV. EXISTING ENVIRONMENT

### Habitat Descriptions

#### *The Merced River and Yosemite National Park*

The Merced River is one of 23 wild and scenic rivers in California and one of six wild and scenic rivers on the western slope of the Sierra Nevada. It is one of 15 major river systems in the Sierra Nevada mountain range of California. Originating in the alpine peaks of the central Sierra Nevada, the river flows west for 145 miles to its confluence with the San Joaquin River in the Central Valley of California, encompassing a drainage basin of about 1,700 square miles. The first 122 miles of the Merced River, beginning at its Sierran headwaters, are designated as wild and scenic; the National Park Service manages 81 miles of the river through Yosemite National Park and the El Portal Administrative Site, including both the main stem and the South Fork Merced River (together referred to as *the Merced River*). In Yosemite National Park, the main stem of the Merced River flows freely through a wilderness landscape of alpine peaks, glacially carved valleys, and high-elevation meadows. As the gradient lessens into Yosemite Valley, the Merced River meanders through the rich meadow and riparian habitat. These wetlands and riparian areas are distinct and important types of vegetation communities that contribute to the outstandingly remarkable biological river values as well as values to biological communities.

Yosemite National Park, one of the largest and least-fragmented habitat blocks in the Sierra Nevada range, supports a diverse and abundant assemblage of wildlife. It plays an important role in protecting the long-term survival of certain species and the overall biodiversity of wildlife in the Sierra Nevada region. The Merced River corridor also serves an essential ecological role in linking wildlife habitats across the park's landscape and gradients of elevation.

Yosemite Valley is a glacier-carved valley with sheer granite cliffs rising over 2,000 feet above the valley floor. Alluvial deposits are found to a depth of about 2,000 feet below the soil surface, creating a huge underground aquifer. Habitats in Yosemite Valley can be loosely grouped into meadow, riparian, and upland. Mammals resident or transient in Yosemite Valley include deer mouse, California ground squirrel, western gray squirrel, broad-footed mole, Botta's pocket gopher, mink, ringtail, raccoon, coyote, bobcat, mule deer, mountain lion, and black bear.

#### *Regional Vegetation and Habitats*

The major vegetation zones of the Sierra Nevada region form readily apparent, large-scale, north-south elevational bands along the axis of the Sierra Nevada range. In the Yosemite region, these vegetation zones include foothill-woodland, lower montane forest, upper montane forest, subalpine forest, and alpine zones; they are distributed from the lowest elevations on the western boundary of the park to the highest elevations from 9,500 feet along the crest of the Sierra Nevada range. Major east-west watersheds that dissect the Sierra Nevada range into steep canyons form a secondary pattern of vegetation.



### Merced River Habitats

All eight major vegetation types supported by Yosemite National Park occur within the Merced River corridor and are presented in **table N-2**, below. It is estimated that half of all plant species in the park occur within the Merced River corridor. The *Special Status Plant Species Report* (NPS, 2011b) concluded that the characteristic pattern of special status species occurrence along the Merced River corridor within Yosemite National Park was found to be within unique habitat types that are often restricted in size. These habitat types are typically associated with specific kinds of water availability, such as waterfall spray zones, braided river channel oxbow cutoffs, gravel bars resulting from periodic flooding, water seepage on rock walls, vernal pools resulting from snowmelt flooding, and the average high water margin of streams and rivers. Although riparian and wetland habitats are not classified independently under the eight broad-scale vegetation types used in the parkwide vegetation map of the Merced River Plan/DEIS, their value as biological communities warrants a thorough discussion. Therefore, they are discussed in-depth below. Additionally, because meadow habitats are integral in connecting upland and aquatic habitats, they are also discussed in-depth in this assessment.

**TABLE N-2: VEGETATION TYPES WITHIN THE MERCED RIVER CORRIDOR**

Vegetation Type	Area per Segment (acres)								Total
	1	2	3	4	5	6	7	8	
Alpine (9,500 to 11,800 feet)*	87.8	0	0	0	6.5	0	0	0	94.3
Meadow (2,000 to 11,000)	1,801.3	324.1	67.6	28.8	389.0	0	140.6	0.9	2,752.3
Chaparral (2,000 to 10,000 feet)	1,669.1	991.4	2,270.6	74.9	694.0	0	166.4	66.6	5,933.0
Subalpine Coniferous Forest (8,000 to 9,500 feet)	9,610.4	45.8	0	0	3,108.9	0	0	0	12765.1
Upper Montane Coniferous Forest (6,000 to 8,000 feet)	16,525.7	3,697.0	1,572.0	0	11,611.8	23.3	990.5	28.4	34,448.7
Lower Montane Coniferous Forest (3,000 to 6,000 feet)	3,505.6	7,248.5	4,785.3	151.4	6,010.4	72.0	4,969.0	1,980.8	28,723.0
Lower Montane Broadleaf Forest (3,000 to 6,000 feet)	461.6	3,331.4	2,982.7	569.7	816.7	3.4	761.1	397.0	9,323.6
Foothill Woodland (1,800 to 3,000 feet)	0	0	9.8	324.8	0	0	0	0	334.6
Barren (1,800 to 11,800 feet)	14,143.4	2,319.5	455.7	27.6	2586.4	2.9	170.2	2.6	19,708.3
Developed	0.3	150.0	59.3	54.5	8.1	0.2	82.2	10.3	364.9
*Elevation ranges are approximated									
SOURCE: NPS 1997; NPS 2007x									

**Meadows.** Meadow habitats within the Merced River corridor include alpine, subalpine, and montane meadows and seeps. The meadows in Yosemite National Park play a particularly critical role in the Merced River ecosystem. There are approximately 2,752.3 acres of meadow habitat within the Merced River corridor. Meadows serve as a transition zone, linking aquatic and riparian habitats along the Merced River to drier upland habitats such as California black oak. High spring flows create wet areas in side channels, low-lying wetlands, meadows, and cutoff channels. These areas support the

concentration of organic matter, nutrients, microorganisms, and aquatic invertebrates throughout the relatively dry summer. When the flush of winter or spring flooding occurs, this stored aquatic biomass is washed into the main river channel, forming the base of the aquatic food chain.

Meadows in Yosemite Valley were maintained in the past by natural flooding and by frequent, low-intensity broadcast fires set by Native American residents of the Valley. Today, prescribed fire is used as a tool to clear the meadows of encroaching conifers and release nutrients into the soil.

Special-status species that use meadows, seeps, and other wetlands in Yosemite Valley for foraging and/or reproduction include the Yosemite toad, Mount Lyell salamander, western pond turtle, northern harrier, olive-sided flycatcher, peregrine falcon, great gray owl, special-status bats, California wolverine, Mount Lyell shrew, Sierra Nevada red fox, special-status sedges and grasses, stream orchid, purple fawnlily, California sunflower, false pimpinell, among others (see table N-3 for a complete listing of special-status species that have been found or could occur in Yosemite Valley).

**Riparian Habitats.** There are approximately 180.7 acres of riparian habitat within the Merced River corridor. Riparian zones extend outward from the banks of the Merced River and its tributaries toward adjacent meadow and forest communities. Broadleaf deciduous trees such as white alder, black cottonwood, and willow characterize riparian zones in Yosemite Valley. Riparian vegetation along moving water is frequently disturbed and constantly responds to the deposition and removal of soil. Riparian vegetation actively colonizes new areas and is made up of a wide range of ages and types of vegetation. This in turn provides a wide range of foraging, nesting, and resting opportunities for wildlife.

Special-status species that are representative of riparian habitats in Yosemite Valley include amphibians (foothill yellow-legged frog, Sierra Nevada yellow-legged frog), reptiles (western pond turtle), birds (yellow warbler, willow flycatcher, harlequin duck), and mammals (special-status bats, Mount Lyell shrew), among others. Special-status plants occurring in riparian habitats include the Sierra sweet bay, stream orchid, purple fawnlily, and Sierra laurel, among others (see Table N-3 for a complete listing of special-status species that have been found or could occur in Yosemite Valley).

**Upland Habitats.** Upland plant communities are found where soil moisture conditions are average to dry and where soils are not periodically flooded or saturated. Upland habitats within the Merced River corridor are comprised of Chaparral, Foothill Woodland, Lower Montane Broadleaf Forest, Lower Montane Coniferous Forest, Subalpine Coniferous Forest, Alpine, and Barren (table N-2, above). In-depth descriptions of each habitat type within each segment of the Merced River are described in Chapter 9 of the Merced River Plan/DEIS (NPS, 2012).

## Segment 1

At its headwaters, the Merced River begins in the lower alpine/subalpine forest zone. The river then descends through the upper montane forest zone and concludes in Little Yosemite Valley within the lower montane forest zone. Vegetation in the upper main stem river corridor is classified into seven broad vegetation types: meadow, chaparral, lower montane broadleaf forest, lower montane coniferous forest, upper montane coniferous forest subalpine coniferous forest, and alpine plant

communities. Special-status species that are representative in upland habitat within the Merced River corridor above Nevada Falls include northern goshawk, golden eagle, northern harrier, yellow warbler, California spotted owl, special-status bat species, California wolverine, western white-tailed jackrabbit, Mount Lyell shrew, Sierra Nevada red fox, and Pacific fisher. Special-status plants occurring in upland habitat within this segment includes California bolandra, redray alpinegold, and Coleman's piperia (see table N-3 for a complete listing of special-status species that have been found or could occur in Segment 1).

## Segment 2

Yosemite Valley is a broad, flat-bottomed valley formed by glaciation and subsequent alluvial deposition. The river corridor includes the Merced River in addition to portions of Illilouette Creek, Tenaya Creek, Yosemite Creek, Sentinel Creek, Ribbon Creek, and Bridalveil Creek. Upland habitats cover about 75% of Yosemite Valley and are dominated by mixed conifer, canyon live oak, California black oak, and microhabitats on steep granite walls (Acree 1994).

Mixed conifer communities in Yosemite Valley are typically dominated by ponderosa pine, but may have significant numbers of incense-cedar, Douglas-fir, white fir, California black oak, and an occasional sugar pine. The mixed conifer community is naturally adapted to low-intensity, frequent fires. Nearly 100 years of fire suppression has resulted in a change from open forest to dense thickets of shade-tolerant tree species such as incense-cedar and white fir. Under natural conditions, the return interval for fire is estimated at 8 to 12 years (NPS 1990). Most undeveloped, mixed conifer areas of Yosemite Valley are now managed through a combination of mechanical removal of hazardous fuel and prescribed burning. These treatments simulate the natural and Native American – maintained fire regimes of the Valley and help decrease forest densities to more natural levels.

Canyon live oak communities grow on both north- and south-facing talus slopes. They often form pure or almost pure stands. Fires in this community are infrequent but intense, with a fire return interval of 20 to 50 years on south-facing slopes. Most trees and shrubs in this community resprout after fires.

In addition to being a component of the mixed conifer community, California black oaks in Yosemite Valley form pure, open stands of large trees with a herbaceous understory. These pure stands are found between the upland forest communities and lower-lying meadow and riparian communities. These stands are unique to the Valley due to thousands of years of Native American activities, including annual burning and removal of young conifers. California black oaks also grow in dense stands on talus slopes near drainages.

Special-status species that are representative of upland habitats in Yosemite Valley include Special-status species that are representative in upland habitat within Yosemite Valley include long-eared owl, Vaux's swift, northern harrier, olive-sided flycatcher, yellow warbler, bald eagle, great gray owl, California spotted owl, special-status bat species, Sierra Nevada mountain beaver, western white-tailed jackrabbit, and American badger. Special-status plants occurring in upland habitat within this segment includes Sierra suncup, Buxbaum's sedge, short-bracted bird's beak, purple fawnlily, tanoak,

monkeyflowers, penstemons, redray alpinegold, and wood saxifrage, among others (see table N-3 for a complete listing of special-status species that have been found or could occur in Yosemite Valley).

### **Segment 3 and 4**

The Merced River gorge travels through the lower montane forest zone and into the foothill-woodland zone, where it enters the El Portal area. Vegetation in the Merced River gorge and El Portal river corridor is classified into four broad vegetation types: chaparral, foothill woodland, lower montane broadleaf forest, and lower montane coniferous forest. Valley oak woodland (foothill woodland) occurs in the El Portal area.

El Portal lies in the Merced River canyon at 2,000 feet in elevation. The Merced River in this segment is lined with a narrow band of riparian vegetation with occasional wider floodplains. A dense mosaic of chaparral and foothill woodland communities lines the steep canyon walls. Many factors shape this unique biological environment, including natural floods and lightning-ignited fire. Soils derived in the contact zone between metamorphic and granitic rock form a unique substrate for vegetation. Many special-status plants are concentrated in this unique area. Steep canyon walls that are almost inaccessible to human passage create secluded refuges for wildlife. Extremely hot and dry summer weather places a critical importance on riparian habitat for many wildlife species.

Special-status species that have been found or could occur in El Portal include the long-eared owl, bald eagle, and Townsend's bigeared bat. Special-status plants with the potential to occur in this segment include Thompkin's sedge, mountain lady's slipper, narrowleaf collinsia, Congdon's woolly-sunflower, tanoak, Congdon's lewisia, northern bugleweed, small flowered monkeyflower, valley oak, and Sierra bladdernut (see table N-3 for a complete listing of special-status species that have been found or could occur in El Portal).

### **Segments 5 and 8**

These segments include nearly a full range of environments typical to the Sierra Nevada. Vegetation zones along the upper South Fork (Segment 5) include the alpine, subalpine, upper montane forest, and lower montane forest zones. Vegetation in the upper South Fork is classified into six broad vegetation types: meadow, chaparral, lower montane broadleaf forest, lower montane coniferous forest, upper montane coniferous forest and subalpine coniferous forest.

Vegetation zones along the lower South Fork (Segment 8) include the lower montane forest and foothill-woodland zones. Vegetation in the lower South Fork is classified into three broad vegetation types: chaparral, lower montane broadleaf forest, and lower montane coniferous forest. These segments of the river are designated as wilderness.

Special-status species with the potential to occur within these segments include the northern goshawk, golden eagle, long-eared owl, olive-sided flycatcher, yellow warbler, California spotted owl, special-status bats, Sierra Nevada mountain beaver, California wolverine, Sierra Nevada snowshoe hare, western white-tailed jackrabbit, Pacific fisher, and Sierra Nevada red fox. Special-status upland plants with the potential to occur along the upper and lower South Forks include the small flowered monkeyflower.

## Segments 6 and 7

Major vegetation zones in the central South Fork (Wawona) include the upper montane forest and lower montane forest zones. Vegetation in the central South Fork is classified into four broad categories: meadow, chaparral, lower montane broadleaf forest, and lower montane coniferous forest.

Special-status species that are representative of these areas include the golden eagle, long-eared owl, Vaux's swift, northern harrier, olive-sided flycatcher, bald eagle, great gray owl, California spotted owl, special-status bats, Sierra Nevada mountain beaver, western white-tailed jackrabbit, pacific fisher, and American badger. Special-status plants representative of these areas include spurred snapdragon, mountain lady's slipper, narrow leaf collinsia, small flowered monkeyflower, Sierra sweet-bay, California red huckleberry, and Hall's mule ears (see **table N-3** for a complete listing of special-status species that have been found or could occur in the Wawona area).

## Species Accounts

**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS**

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in Project Area Segment
<b>Invertebrates</b>			
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	FT	Breeds and forages exclusively on elderberry shrubs ( <i>Sambucus</i> spp.) typically associated with riparian forests, riparian woodlands, elderberry savannas, and other Central Valley and foothill habitats below 3,000 feet in elevation.	3,4,
<b>Fish</b>			
<i>Mylopharodon conocephalus</i> Hardhead	CSC	Inhabits larger middle- and low elevation streams and rivers, from sea level to 4,750 feet. Typically found in undisturbed streams with clear, deep pools that have sand-gravel-boulder substrates and slow water velocities.	4,6,7
<b>Amphibians</b>			
<i>Hydromantes platycephalus</i> Mount Lyell salamander	CSC	Occurs in massive rock areas between 4,000 and 12,139 feet in elevations, in rock fissures, seeps, shade, and low-growing plants. Commonly found in talus slopes of granite where water is flowing. Also found near streams and within the spray zones of waterfalls, under rocks and moss.	1,2,5
<i>Anaxyrus canorus</i> Yosemite toad	FC/CSC	Restricted to wet mountain meadows, lakes, ponds, and shallow spring channels in the central high Sierra Nevada, between 4,790 - 11,910 feet. Wet meadow habitat is the focal habitat for this species	1,5
<i>Rana boylei</i> * Foothill yellow-legged frog	CSC	Primarily found in streams with riffles, rocky substrates and open banks from sea level to 6,390 feet.	2,3,4,6,7,8
<i>Rana sierrae</i> Sierra Nevada yellow- legged frog	FC/CCE/CSC	High mountain lakes, ponds, tarns and streams at elevations ranging from 5,500 to 12,000 feet; rarely found more than 3 feet from water.	1,5

**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS (CONTINUED)**

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in Project Area Segment
<b>Reptiles</b>			
<i>Emys marmorata</i> * Western pond turtle	CSC	Inhabit a wide range of permanent and ephemeral aquatic habitats including ponds, marshes, rivers, streams, and ditches to about 6,700 feet, but are uncommon anywhere above 5,000 feet. Prefers open, grassy south-facing slopes for nest sites.	2,3,4,6,7,8
<b>Birds</b>			
<i>Histrionicus histrionicus</i> Harlequin duck	CSC	Breeds along large, swift-moving mountain rivers with vegetated banks for cover. At the conclusion of the breeding season, they move back to the coast where they forage in intertidal areas.	1-8
<i>Accipiter gentilis</i> Northern goshawk	CSC	Favors moderately dense coniferous forests broken by meadows, and other openings, between 5,000 and 9,000 feet in elevation. Typically nest in mature conifer stands near streams. Forage in mature and old-growth forests that have relatively dense canopies and open understories, but also hunt among a variety of vegetative cover, including meadow edges.	1,5
<i>Aquila chrysaetos</i> Golden eagle	CFP	Forages in open terrain such as grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats; nests in canyons and large trees in open habitats. In the Sierra Nevada, golden eagles favor grasslands and areas of shrubs or saplings, and open-canopied woodlands of young blue oaks.	1-8
<i>Circus cyaneus</i> Northern harrier	CSC	Favors open areas such as grasslands, meadows, wetlands, and agricultural clearings. Rarely seen migrant that passes through Yosemite.	2,7
<i>Haliaeetus leucocephalus</i> Bald eagle	FD/CE/CFP	Nests in tall trees, usually over 100 feet in height, or on cliffs, usually near water. Favor lakes and rivers with abundance prey (mostly fish).	2,3,4,7
<i>Falco peregrinus</i> Peregrine falcon	CFP	Nests on vertical cliff habitat, with large potholes or ledges, that is inaccessible to land predators. Hunts in a wide variety of habitats including meadows, woodlands, marshes, and mudflats.	1,2,3,5,7
<i>Asio otus</i> Long-eared owl	CSC	In the Sierra Nevada, this species is found from blue oak savannah up to ponderosa pine and black oak habitats, usually in association with riparian habitats.	2,3,4,5,6,7,8
<i>Strix nebulosa</i> Great gray owl	CE	Entire California population of this species is restricted to the Yosemite region. Breeds in mixed conifer/red fir forests bordering meadows. Winters in mixed conifer down to blue oak woodlands.	2,7
<i>Strix occidentalis occidentalis</i> California spotted owl	CSC	Strongly associated with areas of mature and old forest with thick dense canopy closure that contains many dense, old, live trees and snags and fallen logs.	1,2,3,5,7
<i>Chaetura vauxi</i> Vaux's swift	CSC	Inhabits redwood and Douglas-fir habitats. Utilizes large hollow trees and snags, especially tall, burned-out stubs for nest sites. Breeding occurs in Yosemite Valley, usually in forested habitat near meadows.	2,3,7,8

**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS (CONTINUED)**

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in Project Area Segment
<b>Birds (cont.)</b>			
<i>Cypseloides niger borealis</i> Black swift	CSC	In Yosemite, black swifts only nest near or behind waterfalls, through elsewhere in their range nests are found on sea cliffs or other sheer rock faces.	2
<i>Contopus cooperi</i> Olive-sided flycatcher	CSC	Breeds in montane and northern coniferous forests, at forest edges and openings, such as meadows and ponds. Winters at forest edges and clearings where tall trees or snags are present.	1,2,5,7
<i>Empidonax traillii</i> Willow flycatcher	CE	Breeds in moist, shrubby areas, often with standing or running water. Winters in shrubby clearings and early successional growth. Deciduous trees and shrubs interspersed with open areas enhances the quality of foraging habitat	2,6,7
<i>Setophaga petechia</i> Yellow warbler	CSC	Prefers riparian woodlands, but also breeds in chaparral, ponderosa pine, and mixed conifer habitats with substantial amounts of brush.	1-8
<b>Mammals</b>			
<i>Sorex lyelli</i> Mount Lyell shrew	CSC	Found primarily in wetland communities, near streams, in grassy areas, under willows, and in sagebrush steppe communities. Requires moist soil and uses logs, stumps, and other surface objects for cover.	1,5
<i>Antrozous pallidus</i> Pallid bat	CSC	Common species of low elevations in California. Occupies grasslands, desert, shrublands, woodlands, and forests from sea level up through mixed conifer forests. This species is quite versatile in its choice of roosting sites, and has been documented using tree hollows, rock crevices, caves, abandoned mines, and structures.	1-8
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	CSC	Found in all habitat types from low to moderate elevations. Not found in high elevation subalpine and alpine habitats. Requires caves, mines, or buildings for roosting. Prefers mesic habitats where it gleans from brush or trees along habitat edges.	2,3,4,7,8
<i>Euderma maculatum</i> Spotted bat	CSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. In montane habitats, the spotted bat forages over meadows, along forest edges, or in open coniferous woodland. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	1,2,5,7
<i>Lasiurus blossevillii</i> Western red bat	CSC	Typically found in trees, hedgerows, and forest edges. Roosts in foliage in summer.	1-8
<i>Eumops perotis</i> Western mastiff bat	CSC	Found in a variety of habitats, from desert scrub and chaparral to montane coniferous forest. Typically found in rocky cliff and canyon areas. Its presence is determined by the availability of significant rock features offering suitable roosting habitat.	1,2,5,7

**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS (CONTINUED)**

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in Project Area Segment
<b>Mammals (cont.)</b>			
<i>Lepus americanus tahoensis</i> Sierra Nevada snowshoe hare	CSC	Boreal riparian areas in the Sierra Nevada. Thickets of deciduous trees in riparian areas and thickets of young conifers.	1,5
<i>Lepus townsendii townsendii</i> Western white-tailed jackrabbit	CSC	Inhabits a variety of habitats, including sagebrush, perennial grasslands, alpine dwarf-shrub, early successional conifer habitats, and wet meadows to timberline and above.	1,5
<i>Aplodontia rufa californica</i> Sierra Nevada mountain beaver	CSC	Dense growth of small deciduous trees and shrubs, wet soil, and abundance of forbs in the Sierra Nevada and east slope. Needs dense understory for food and cover. Burrows into soft soil. Needs abundant supply of water.	1,5
<i>Vulpes vulpes necator</i> Sierra Nevada red fox	CT	Occupied habitats are typical of the high Sierra Nevada: high elevation barren, conifer and shrub habitats, montane meadows, talus slopes, subalpine woodlands, and fell-fields. Found mostly above 7,000 feet and rarely below elevations of 5,000 feet.	1,5
<i>Gulo gulo</i> California wolverine	FC/CT/CSC	Habitats used in the southern Sierra Nevada include red fir, mixed conifer, lodgepole, subalpine conifer, alpine dwarf-shrub, barren, wet meadows, montane chaparral, and Jeffrey pine, from 6,400 to 10,800 feet. Uses caves, hollows in cliffs, logs, rock outcrops, and burrows for cover and denning.	1,5
<i>Martes pennanti pacifica</i> Pacific fisher	FC/CSC	Dens and bears young in the cavities of large trees or snags and strongly associated with mid-elevation mature and late successional coniferous or mixed forests. Generally found in stands with high canopy closure, large trees and snags, large woody debris, large hardwoods, and multiple canopy layers.	1,2,5,7
<i>Taxidea taxus</i> American badger	CSC	Drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	7
<i>Ovis canadensis sierrae</i> Sierra Nevada bighorn sheep	FE/CE/CFP	Occurs primarily along the Sierra Crest in the northeast portion of the park. Most of the herd inhabits Forest Service land adjacent to the park.	5
<p>STATUS:</p> <p>FE – Federal Endangered</p> <p>FT – Federal Threatened</p> <p>FC – Federal Candidate</p> <p>FD – Federal Delisted</p> <p>CE – California Endangered</p> <p>CT – California Threatened</p> <p>CCE – California Candidate Endangered</p> <p>CFP – California Fully Protected Species</p> <p>CSC – California Species of Concern</p> <p>*Believed to be extirpated from the Merced River Corridor</p> <p>SOURCE: <i>Special Status Wildlife Species Report for the Merced River Corridor in Yosemite National Park</i> (NPS 2011a)</p>			



**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS (CONTINUED)**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Potential to Occur in Project Area Segment
<b>Plants and Fungi</b>			
<i>Antirrhinum leptaleum</i> Spurred snapdragon	SSP	Small washes, shallow ditches, disturbed areas, in foothill woodland, yellow pine forest; historic collection from Wawona; elevations between 300-2100 meters.	7
<i>Asarum lemmonii</i> Lemmon's wild ginger	SSP	Shady wet places along creeks, north-facing river banks; Yosemite Valley, Wawona; elevations between 1100-1900 meters.	2,7
<i>Bolandra californica</i> California bolandra	SSP/4.3	Lower and upper montane coniferous forest, mesic, rocky shaded places; Lyell Fork Merced River; elevations between 2000-3000 meters.	1
<i>Bulbostylis capillaris</i> Threadleaf beakseed	SSP/4.2	Meadows and seeps, meadow habitats, vernal moist gravel pans; Yosemite Valley; elevations between 1000-2000 meters.	2
<i>Camissonia sierrae</i> ssp. <i>alticola</i> Mono Hot Spring evening primrose	SSP/1B.2	On vernal moist gravel and sand pans; Merced Lake; elevations between 2000 - 2350 meters.	1
<i>Camissonia sierrae</i> ssp. <i>sierrae</i> Sierra suncup	SSP/4.3	Granite gravel seepage areas; Yosemite Valley; elevations between 500-1300 meters.	2
<i>Carex buxbaumii</i> Buxbaum's sedge	SSP/4.2	Montane and subalpine fens; Coastal Prairie, Yellow Pine Forest, Red Fir Forest, Lodgepole Forest, Subalpine Forest, Meadows and seeps, wet conditions in meadow habitats. Yosemite Valley; elevations between 1200-3300 meters.	2
<i>Carex canescens</i> Silvery sedge	SSP	Lake margins, drainages in wet meadows; historic collection from Clark's Wawona; elevations between 1000-3200 meters.	7
<i>Carex fissuricola</i> Cleft sedge	SSP	Meadow slopes and flats, among rocks, wet areas, spray zones; Nevada Falls; elevations between 1500-3500 meters.	1
<i>Carex sartwelliana</i> Yosemite sedge	SSP	Moist forest openings and meadow borders; Wildcat Creek; elevations between 1200-2600 meters.	1,2,5,7
<i>Carex tompkinsii</i> Thompkins' sedge	SSP/4.3/ Rare	Canyon slopes and river bottomlands under conifer-oak woodland canopy; El Portal area; elevations between 1200-1800 meters.	4
<i>Cinna bolanderi</i> Bolander's woodreed	SSP/1B.2	Montane stringer meadows and fens; Wawona & Little Yosemite Valley; elevations between 1670-2440 meters.	1,7
<i>Collinsia linearis</i> Narrow leaf collinsia	SSP	Rocky, metamorphic substrates of broad-leaved upland forest, chaparral, cismontane woodland; El Portal & Wawona; elevations between 200-2000 meters.	4,7

**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS (CONTINUED)**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Potential to Occur in Project Area Segment
<b>Plants and Fungi (cont.)</b>			
<i>Cordylanthus rigidus</i> ssp. <i>brevibracteatus</i> Short-bracted bird's beak	SSP/4.3	North side Yosemite Valley, dry sandy roadside full sun, 1 mi E Cascade Creek; elevations between 1100-2500 meters.	2
<i>Cypripedium montanum</i> Mountain lady's slipper	SSP/4.2	Deep humus and shade of canyon bottoms; Wawona & below Yosemite Valley; elevations between 200-2200 meters.	3,7
<i>Epipactis gigantea</i> Stream orchid	SSP	Moist conditions in meadows, streambank habitats & cliff basins; Yosemite Valley; elevations between 1500-2600 meters.	2
<i>Eriophyllum congdonii</i> Congdon's woolly sunflower	SSP/1B.2/Rare	Sunny rocky slopes on metamorphic talus; next to river in El Portal; elevations between 500-1900 meters.	4
<i>Erythronium purpurascens</i> Purple fawnlily	SSP	Open forests, meadows, rocky places; Yosemite Valley - possibly extinct; elevations between 1500-2700 meters.	2
<i>Glyceria borealis</i> Northern mannagrass	SSP	Marshes and shallow lake borders; Yosemite Valley; elevations between 800-1250 meters.	2
<i>Helianthus californicus</i> California sunflower	SSP	Meadows, seeps, streambanks, seasonally inundated areas; Wawona; elevations between 1600-2000 meters.	7
<i>Hippuris vulgaris</i> Common mare's tail	SSP	Lakes, ponds, springs, rivers. Little Yosemite Valley; elevations between 0-2600 meters.	1
<i>Hulsea heterochroma</i> Redray alpinegold	SSP	Chaparral, openings in yellow pine forest, Yosemite Valley, 5 miles above Nevada Fall; elevations between 300-2500 meters.	1,2
<i>Isoetes occidentalis</i> Western quillwort	SSP	Mountain lakes and rivers; In Merced River Little Yosemite Valley; elevations between 1500-2500 meters.	1
<i>Leucothoe davisiae</i> Sierra laurel	SSP	Moist, shaded drainage bottoms along creeks and rivers; Yosemite Valley; elevations between 1300-2600 meters.	2
<i>Lewisia congdonii</i> Congdon's lewisia	SSP/1B.3/Rare	Lower montane coniferous forest, metamorphic cliffs; El Portal; elevations between 500-2800 meters.	3,4
<i>Lindernia dubia</i> var. <i>anagallidea</i> False pimpernel	SSP	Exposed margins of lakes and ponds, mudflats; Yosemite Valley; elevations between 500-1600 meters.	2
<i>Lithocarpus densiflorus</i> var. <i>echinoides</i> Tanoak	SSP	Dry shady forest conditions in slope habitats; Merced River below Yosemite Valley; elevations between 600-2000 meters.	2,3
<i>Lycopus uniflorus</i> Northern bugleweed	SSP/4.3	Moist areas, marshes, near springs; Merced River banks from El Portal up; elevations between 1600-2000 meters.	3,4

**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS (CONTINUED)**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Potential to Occur in Project Area Segment
<b>Plants and Fungi (cont.)</b>			
<i>Mimulus bicolor</i> Yellow and white monkeyflower	SSP	Occurs under vernal moist conditions; usually in non-wetlands, but occasionally found on wetlands & river bottomlands; Wawona; elevations between 360-2100 meters.	7
<i>Mimulus inconspicuus</i> Small flowered monkeyflower	SSP/4.3	Chaparral, cismontane woodland, lower montane coniferous forest, mesic, shady areas; mouth of Moss Creek; elevations between 160-2000 meters.	2,3,7,8
<i>Mimulus laciniatus</i> Cutleaf monkeyflower	SSP/4.3	Chaparral, lower and upper montane coniferous forest, mesic areas of granitic substrate, vernal moist seepage areas; Yosemite Valley; elevations between 900-2000 meters.	2
<i>Mimulus pulchellus</i> Yellowlip pansy monkeyflower	SSP/1B.2	Lower montane coniferous forest, vernal mesic meadows; Yosemite Valley; elevations between 600-2000 meters.	2
<i>Myrica hartwegii</i> Sierra sweet bay	SSP	Stream and riverbanks; Along Merced below Wawona; elevations between 300-1500 meters.	7,8
<i>Narthecium californicum</i> California bog asphodel	SSP	Fens, seeps; occurs under wet conditions by streams and waterfalls; Bridalveil Falls; elevations between 700-2600 meters.	2
<i>Penstemon azureus</i> ssp. <i>angustissimus</i> Azure penstemon	SSP	Chaparral, Yellow Pine Forest, Sagebrush Scrub, Foothill Woodland; occurs under dry conditions in slope habitats. Yosemite Valley; elevations between 300-700 meters.	2
<i>Penstemon heterophyllus</i> var. <i>purdyi</i> Purdy's foothill penstemon	SSP	Chaparral, Foothill Woodland, Yellow Pine Forest; occurs under dry conditions in slope habitats. Yosemite Valley; elevations between 50-1600 meters.	2
<i>Phacelia tanacetifolia</i> Tansy leafed phacelia	SSP	Habitat variable, occurs in slope habitats; Bridalveil Falls, Yosemite Valley; elevations between 1000-2000 meters.	2
<i>Pinus albicaulis</i> Whitebark pine	FC	Cold, windy high elevation sites between 3,000 meters-3,750 meters	1,2,5
<i>Piperia colemanii</i> Coleman's piperia	G3/4.3	Chaparral, lower montane coniferous forest. Little Yosemite Valley; elevations between 1200-2300 meters.	1
<i>Plagiobothrys torreyi</i> var. <i>torreyi</i> Torrey's popcornflower	SSP/1B.2	Moist meadows and flats, forest edges; Yosemite Valley; elevations between 1200-3400 meters.	2
<i>Potamogeton epihydrus</i> ssp. <i>nuttallii</i> Nuttall's pondweed	SSP/2.2	Freshwater marshes, tanks; Yosemite Valley; elevations between 400-1900 meters.	2
<i>Quercus lobata</i> Valley oak	SSP	Deep soil on slopes and in valleys. Known from a few majestic specimens in El Portal; elevation 720 meters.	4

**TABLE N-3: PRESENTS A SUMMARY OF SPECIAL-STATUS WILDLIFE AND PLANT SPECIES ADDRESSED IN THIS ANALYSIS (CONTINUED)**

Scientific Name Common Name	Listing Status: Park/CNPS/ State	General Habitat	Potential to Occur in Project Area Segment
<b>Plants and Fungi (cont.)</b>			
<i>Saxifraga mertensiana</i> Wood saxifrage	SSP	Mossy rocks, cliffs; Yosemite Valley; elevations between 1000-2500 meters.	2
<i>Saxifraga oregana</i> Oregon saxifrage	SSP	Meadows and seeps; occurs under wet conditions in meadow habitats; Yosemite Valley & Little Yosemite Valley; elevations between 150-2500 meters.	1,2
<i>Scutellaria bolanderi</i> ssp. <i>bolanderi</i> Sierra skullcap	SSP	Gravelly soils, stream & riverbanks, meadows in oak or pine woodland; Wawona; elevations between 300-2000 meters.	7
<i>Senecio clarkianus</i> Clark's ragwort	SSP	Damp montane meadows; Wawona; elevations between 1400-2700 meters.	7
<i>Sparganium natans</i> Small bur reed	SSP/4.3	Freshwater wetlands, in lake margin and edge habitats, tanks in meadows; tributaries of Merced River; elevations between 2000-2500 meters.	2,7
<i>Staphylea bolanderi</i> Sierra bladder nut	SSP	Chaparral, Foothill Woodland, Yellow Pine Forest; occurs in shaded canyon habitats; Merced River Canyon in El Portal; elevations between 240-1720 meters.	3,4
<i>Trillium angustipetalum</i> Narrowpetal wakerobin	SSP	Shaded bottomlands; Wawona, Yosemite Valley; elevations between 100-2000 meters.	2,7
<i>Vaccinium parvifolium</i> California red huckleberry	SSP	Moist, shaded drainage bottoms along creeks and rivers; Merced River Wawona area; elevations between 1400-2500 meters.	7
<i>Wyethia elata</i> Hall's mule ears	SSP/4.3	Open woodland, forest; Wawona; elevations between 1000-1400 meters.	7
<p>STATUS:</p> <p>FC – Federal Candidate</p> <p>Rare: Designated as rare by the State of California</p> <p>SSP: Park Designated Special Status Species</p> <p>CNPS RANKINGS:</p> <p>List 1A: Plants presumed extinct in California</p> <p>List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere</p> <p>List 2: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere</p> <p>List 3: Need more information</p> <p>List 4: Plants of Limited Distribution</p> <p>Threat Ranks:</p> <p>.1: Seriously endangered in California</p> <p>.2: Fairly endangered in California</p> <p>.3: Not very endangered in California</p> <p>SOURCE: Special Status Plant Species in the Merced River Corridor within Yosemite National Park (NPS 2011b)</p>			

## Federal Endangered Species

### *Mammals*

#### **Sierra Nevada bighorn sheep** *Ovis canadensis sierrae*

**Status.** Federal Endangered, California Endangered, California Fully Protected

**General Distribution.** Sierra Nevada bighorn sheep use habitats ranging from the highest elevations along the crest of the Sierra Nevada (4,000 meters [13,120 feet]) to winter ranges at the eastern base of the range as low as 1,450 meters (4,760 feet) (USFWS 2007). The Sierra Nevada bighorn sheep population has increased from a low of 100 individuals in 1995 to more than 400 animals since the species was listed as endangered under the federal ESA in 1999. The Yosemite Recovery Unit consists of approximately 40 individuals at high elevations along the northeastern section of Yosemite.

**Habitat Requirements.** Habitats used by Sierra Nevada bighorn sheep include alpine dwarf-shrub, low sage, sagebrush, bitterbrush, pinyon-juniper, palm oasis, desert riparian, desert succulent shrub, desert scrub, subalpine conifer, perennial grassland, montane chaparral, and montane riparian (DeForge 1980, Monson and Sumner 1980, Wehausen 1980). Bighorn sheep use rocky, steep terrain for escape and bedding and remain near rugged terrain while feeding in open habitat (Zeiner et al. 1990). Low-elevation winter ranges provide this species an important source of high quality forage early in the growing season (USFWS 2007). They use steep, rugged slopes and canyons for lambing areas (Wehausen 1980).

**Status in Merced River Corridor.** Historically, bighorn sheep occupied alpine and subalpine areas along the Sierra Crest and in the Cathedral Range. It is generally believed that they seasonally migrated from the crest to winter on the eastern escarpment. Given that they occupied the Cathedral Range, it is very likely that bighorn sheep historically occupied the upper reaches of the Merced River drainage. A Museum of Vertebrate Zoology specimen was taken from the east lobe of Lyell Glacier within 1 kilometer (0.62 mile) of the Merced River corridor in October 1933. Another specimen was taken within 3 kilometers of the river corridor east of Crescent Lake near Wawona in 1921 (Museum of Vertebrate Zoology Database 2011). In 1976, a bighorn sheep was sighted near Donohue Pass, approximately 3.5 kilometers northeast of the Merced River corridor (Yosemite Wildlife Observation Database 2011). Although rams might occasionally (rarely) wander into the upper (along the crest) Merced River drainage, it is highly unlikely that bighorn sheep currently occupy the Merced River drainage (Chow, pers. comm.). In addition, bighorn sheep critical habitat (designated in 2008 by USFWS) does not occur within the Merced River corridor.

## Federal Threatened Species

### *Invertebrates*

#### **Valley elderberry longhorn beetle** *Desmoscerus californicus dimorphus*

**Status.** Federally threatened

**General Distribution.** The valley elderberry longhorn beetle is found in areas below 915 meters (3,000 feet) in elevations that support species of elderberry (*Sambucus* sp.). At the time of listing in 1980, the beetle was known from fewer than 10 locations on the American River, Putah Creek, and Merced River. Current distribution ranges from southern Shasta County to Fresno County.

**Habitat Requirements.** The valley elderberry longhorn beetle is an invertebrate species that is completely dependent on its host plant, elderberry, throughout its one-year to two-year life cycle. The beetle spends most of its life in the larval stage, living in the stems of elderberry shrubs. Adults emerge from late March through June, when feeding and mating occurs, about the same time the elderberry flowers. The adult stage is short-lived; females lay their eggs on the bark, larvae hatch and burrow into the stems, and the cycle is repeated. Although elderberry shrubs are relatively common in riparian habitat, it appears that to serve as suitable habitat, shrubs must have stems that are 1 inch or greater in diameter at ground level (Barr 1991). Use of elderberry by the beetle is rarely apparent. Frequently, the only exterior evidence of the use by the beetle is a distinct exit hole created by the larva just before the pupal stage.

**Status in Merced River Corridor.** The El Portal Administrative Site is the only area in Yosemite National Park that lies below 915 meters (3,000 feet) in elevation. In El Portal, elderberry plants represent a subdominant species within live oak forests, interior live oak forests, interior live oak woodlands, blue oak woodlands, canyon live oak forests, mixed north slope forests, foothill pine/live oak/chaparral woodlands, northern mixed chaparral, interior live oak chaparral, and westside ponderosa pine forests. Elderberry shrubs are scattered throughout the El Portal Administrative Site.

## Federal Candidate Species

### *Amphibians*

#### **Yosemite toad** *Bufo canorus*

**Status.** Federal candidate, California species of special concern

**General Distribution.** The historic range of Yosemite toads in the Sierra Nevada occurs from the Blue Lakes region north of Ebbetts Pass (Alpine County) to 5 kilometers (3.1 miles) south of Kaiser Pass in the Evolution Lake/Darwin Canyon area (Fresno County) (Jennings and Hayes 1994). Historically, the

toad ranged from 1,460 meters to 3,630 meters (4,790 feet to 11,910 feet) in elevation (Stebbins 1985) throughout its range and from 1,950 meters to 3,444 meters (6,400 feet to 11,300 feet) in elevation in Yosemite (Karlstrom 1962). The toad is currently known from 179 sites in Yosemite between the elevations of 2,134 meters to 3,505 meters (7,000 feet to 11,500 feet) (Knapp 2003). Estimates suggest that the toad has disappeared from between 47% and 79% of the sites that it previously occupied (Jennings and Hayes 1994, Drost and Fellers 1996). Remaining populations appear more scattered across the landscape and consist of a small number of breeding adults (Kagarise Sherman and Morton 1993).

The NPS surveyed 446 meadows for Yosemite toads during the summer of 2010, 166 of which had been surveyed at least once between 1992 and 2009. The remaining 280 meadows had never been surveyed. The surveys documented 44 new breeding populations of toads, and increased the number of documented breeding populations from 135 to 179. Toads were not found in approximately 50% of the sites where toads had been previously documented, while 9% of meadows where toads had not been documented previously had breeding during the 2010 survey.

**Habitat Requirements.** The Yosemite toad has been recorded in a broad range of high montane, subalpine, and alpine habitats, including wet meadows, lakes, ponds, and shallow spring channels. The Yosemite toad is most commonly found, however, in shallow, warm water areas, including standing and flowing water in wet meadows, small permanent and ephemeral ponds, and flooded shallow grassy areas and meadows adjacent to lakes (Karlstrom 1962). Wet meadow habitat is the focal habitat for this species.

**Status in the Merced River Corridor.** Yosemite toad observations have been recorded on 2,142 occasions in Yosemite. Of these observations, 11 records are from the Merced River corridor. There are no records of Yosemite toads within the Merced River corridor prior to 1999, which is likely due to a lack of survey efforts targeting the toad. Between 1999 and 2010, there were a multiple sightings at higher elevation sites around Triple Divide, Isberg, and Rodgers peaks.

### Sierra Nevada yellow-legged frog *Rana sierrae*

**Status.** Federal candidate, California candidate

**General Distribution.** Sierra Nevada yellow-legged frogs currently range from north of the Feather River in northern Plumas County, California, south, including all of Yosemite, to the divide between the South and Middle Forks of the Kings Rivers in Kings Canyon National Park. The majority of their range is in federally designated wilderness. Despite the fact that most of their habitat is fully protected, the Sierra Nevada yellow-legged frog has disappeared from >93% of their historic range. The declines have escalated since the late 1970s, and most of the remaining populations are much smaller than those that would have occurred historically (Knapp 2005). Consequently, the Sierra Nevada yellow-legged frog has gone from being one of the most abundant species in the Sierra Nevada (Grinnell and Storer 1924) to one that is considered critically endangered. This species is currently known to occur at approximately 166 sites in Yosemite at elevations ranging from 1,676 meters to 3,536 meters (5,500 feet

to 11,600 feet). The Sierra Nevada yellow-legged frog is a candidate species for listing under the federal ESA, and the USFWS plans to initiate a proposed rule to list this species in 2013. A listing decision would occur within 12 months of proposed ruling.

**Habitat Requirements.** The Sierra Nevada yellow-legged frog occupies aquatic habitats for almost all of their seasonal life history; they breed, tadpoles develop, and they overwinter in lakes and ponds or low-flowing streams and use flowing water to move between sites. This species is rarely found more than a few feet from water. Because it overwinters in water and has a multi-year tadpole phase, it requires waters that are deep enough that they don't freeze solid in the winter and they don't dry out during the summer.

**Status in the Merced River Corridor.** Sierra Nevada yellow-legged frog observations have been recorded on 4,581 occasions in Yosemite. Of these observations, 20 records are from the Merced River corridor. Most of the sites where Sierra Nevada yellow-legged frogs are known to exist fall outside of the Merced River corridor. Concerted efforts to survey amphibians in the park have been conducted between 1992 and 2010. Before 1992, there were five records of Sierra Nevada yellow-legged frogs within the river corridor at Wawona (1922), Yosemite Valley (1922, 1958), Triple Peak (1940), and Horsethief Canyon (1991). One of the historic records from Yosemite Valley may have been from farther up Tamarack Creek rather than from the Valley. During a comprehensive survey of all mapped and unmapped lakes and ponds in Yosemite conducted in 2000–2002, Knapp (2005) observed Sierra Nevada yellow-legged frogs at 13 sites around Red and Rodgers peaks. A total of 30 adults or subadults and about 1400 tadpoles were recorded at these sites. Between 1992 and 2010, there were two additional observations in the upper reaches of the Merced River.

## Mammals

### California Wolverine *Gulo gulo luteus*

**Status.** Federal candidate, California threatened

**General Distribution.** The California wolverine is an uncommon resident of north Coast Range mountains and the Sierra Nevada. Sightings range from Del Norte and Trinity counties east through Siskiyou and Shasta counties, and south through Tulare County (Zeiner et al. 1990). Wolverines have not been scientifically confirmed in California since the 1920s, but a remote camera sighting detected an individual wolverine in Tahoe National Forest in March 2008.

**Habitat Requirements.** Habitats used by the California wolverine in the southern Sierra Nevada include red fir, mixed conifer, lodgepole, subalpine conifer, alpine dwarf-shrub, barren, wet meadows, montane chaparral, and Jeffrey pine, while their elevation range in the southern Sierra Nevada is 2,000 meters to 3,400 meters (6,400 feet to 10,800 feet) (Zeiner et al. 1990). The wolverine uses caves, hollows in cliffs, logs, rock outcrops, and burrows for cover and denning, generally in denser forest stages (Zeiner et al. 1990). The wolverine may dig dens in the snow. Wolverines are hunters and scavengers and feed primarily on small mammals and carrion but might kill large snowbound prey (Grinnell et al. 1937, Ingles 1965). Wolverines have extremely large home ranges; in Montana, their



yearly home range was 422 km<sup>2</sup> (156 mi<sup>2</sup>) for males and 388 km<sup>2</sup> (144 mi<sup>2</sup>) for females (Hornocker and Hash 1981).

**Status in Merced River Corridor.** Two California wolverine specimens were collected at the head of Lyell Canyon in 1915, just 2 kilometers from the Merced River corridor (Museum of Vertebrate Zoology Database 2011). There have been three unconfirmed sightings within the corridor; along the south fork of the Merced River in 1959, near Pohono Bridge in 1990, and near the junction of Iron Creek and the Merced River in 1959 (Yosemite Wildlife Observation Database 2011). The likelihood of these latter three sightings being legitimate is highly unlikely, however.

### **Pacific fisher** ***Martes pennanti pacifica***

**Status.** Federal candidate, California species of special concern

**General Distribution.** Although the historic distribution of Pacific fisher was once contiguous across California and the Pacific Northwest, including the northern Coast range, Klamath Mountains, southern Cascades, and western slope of the Sierra Nevada, the fisher has declined during the past century. Remaining populations are geographically and, in some cases, genetically isolated from one another (Grinnell et al. 1937, Zielinski et al. 1995). Pacific fisher currently occur in only two regions of the state, which are separated by over 430 kilometers: the northwest, including the northern Coast Range and Klamath Province; and the southern Sierra Nevada, including Yosemite National Park (Zielinski et al. 1995). Yosemite lies at the northern tip of the fisher's southern range. The fisher's elevation range is approximately 1,219 meters to 2,134 meters (4,000 feet to 7,000 feet).

**Habitat Requirements.** The Pacific fisher is one of the most habitat-specific mammals in North America (Buskirk and Powell 1994). Fishers den and bear young in the cavities of large trees or snags and are strongly associated with mid-elevation, mature and late successional coniferous or mixed forests (Powell and Zielinski 1994, Zielinski et al. 2004a, 2004b). In particular, fisher are generally found in stands with high canopy closure, large trees and snags, large wood, large hardwoods, and multiple canopy layers. Fisher generally avoid entering open areas that have no overstory or shrub cover (Buskirk and Powell 1994), while Chow (2009) found that fisher in Yosemite prefer habitat near permanent streams. The fisher has a varied diet consisting primarily of small mammals, such as squirrels, but they also consume porcupines, birds, invertebrates, vegetation, and fruit (Powell and Zielinski 1994).

**Status in Merced River Corridor.** Fisher are elusive and more challenging to detect compared with other carnivores, but recent fisher surveys (2009–2011) conducted in collaboration with U.C. Berkeley have confirmed the presence of 5–8 individual fisher south of the Merced River near Chinquapin, Wawona, Mariposa Grove, and along the South Fork Merced River. Previous fisher surveys in the park conducted by Chow (2009) during 1992–1994 detected relatively few fisher despite the availability of suitable habitat and use of a combination of survey methods, including remote cameras and track plates. Chow (2009) concluded that Pacific fisher inhabit Yosemite at very low population densities. The Merced River may be one of multiple barriers currently preventing northward expansion of their

range. Two fisher specimens were collected within the Merced River corridor in Yosemite Valley in 1919 and 1920 (Museum of Vertebrate Zoology Database 2011).

### *Plants*

#### **Whitebark pine** *Pinus albicaulis*

*General Ecology and Distribution.* Whitebark pine, a tree from the pine family, is native to California. It occurs in subalpine and upper montane forests at elevations ranging between 2,300 and 4,000 meters. It is considered a keystone species and a major food source for many species of birds and mammals. Whitebark pine is rapidly declining throughout most of its range, primarily due to a combination of white pine blister rust, periodic mountain pine beetle outbreaks, fire suppression, and climate change (Natural Resources Defense Council [NRDC], 2008 and Fryer, 2002).

*Habitat and Status in the Project Area.* This species occurs on cold and windy, high-elevation sites in isolated stands in the subalpine zone. However, it also co-occurs with a diversity of conifers that vary by location and elevation (NRDC, 2008 and Fryer, 2002). In the Project Area, it is found in Segments 1, 2, and 5 (Merced River above Nevada Fall, Yosemite Valley, and South Fork above Wawona, respectively).

### **California State Endangered Species**

Sierra Nevada bighorn sheep (see Federal Endangered Species section)

### *Birds*

#### **Willow flycatcher** *Empidonax traillii*

**Status.** California endangered

**General Distribution.** The willow flycatcher is a neotropical migrant that breeds in riparian and moist meadow willow thickets in the United States and southern Canada (American Ornithologists' Union 1983). The willow flycatcher winters from Mexico to northern South America. Currently, about half of the willow flycatcher breeding population in California occurs in the Sierra Nevada (Zeiner et al. 1990, Kus et al. 2000). Most willow flycatchers in the Sierra Nevada are found at elevations from 366 meters to 2,900 meters (1,200 feet to 9,500 feet), although most of the known willow flycatcher sites (88%) occur at elevations between 1,200 meters and 2,400 meters (3,900 feet to 7,900 feet) (Serena 1982, Harris et al. 1988, Stafford and Valentine 1985). Willow flycatchers are a rare former breeder in Yosemite.

**Habitat Requirements.** As their name suggests, willow flycatchers frequent the willows found along languid streams and, to a lesser degree, within moist meadows (Gaines 1992). Deciduous trees and shrubs interspersed with open areas enhance the quality of foraging habitat. Willow flycatchers forage by either gleaning insects from vegetation while flying, or by waiting on an exposed perch and capturing insects in flight (Ettinger and King 1980, Sanders and Flett 1989).

**Status in Merced River Corridor.** Once a commonly observed bird in Yosemite Valley, willow flycatchers are now exceedingly rare in the park as a whole. Willow flycatcher observations have been recorded on 50 occasions in Yosemite. Of these observations, 26 records are from the Merced River corridor. The first documented observation of a willow flycatcher in Yosemite was made by the Grinnell survey in 1915. Almost all of the river corridor's willow flycatcher observations fall between 1915 and 1931 (Yosemite Wildlife Observation Database 2011). Gaines (1992) indicates that they had stopped breeding in the Valley by 1966. Two observations from the 1970s (Yosemite Valley 1974, Wawona 1977) are the most recent sightings of willow flycatchers in the river corridor, although they are still seen on rare occasions elsewhere in the park. A recent study found that willow flycatchers no longer breed in Yosemite National Park (Siegel et al. 2008).

### **Bald eagle** *Haliaeetus leucocephalus*

**Status.** California State endangered, California fully protected

**General Distribution.** Bald eagles are found throughout North America, and there are breeding populations in almost all U.S. states and Canadian provinces. Once far more numerous than they are today, bald eagle populations suffered tremendously during the 20<sup>th</sup> century due to state-enacted bounties (Robards and King 1966) and poisoning from pesticides like DDT (Buehler 2000). Stricter protection measures and a reduced exposure to environmental toxins has led to the large-scale recovery of bald eagles, a feat widely regarded as one of the most successful modern conservation efforts. Bald eagles are uncommon but occasional breeders in Yosemite.

**Habitat Requirements.** Bald eagles favor lakes and rivers with abundant prey (mostly fish) and large trees in which to nest. The relative paucity of bald eagle observations in Yosemite indicates that there may be insufficient fish in Yosemite rivers to support a robust eagle population. Bald eagles also compete directly with ospreys, occasionally stealing food from them. Bald eagles are regularly observed in Sierra foothill reservoirs and at lakes east of Tioga Pass; in both locations the eagles are feeding on stocked fish populations that are higher in elevation than what would naturally be present.

**Status in Merced River Corridor.** Bald eagle observations have been recorded on 123 occasions in Yosemite. Of those observations, 25 records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). Roughly half of the bald eagle observations in the river corridor are from areas downstream of Yosemite Valley. The first records of bald eagles in Yosemite are from Wawona (November 1957). From the late 1970s to 1992, bald eagles were documented in the river corridor at a rate of one every few years.

## California State Threatened Species

California wolverine (see Federal Candidate Species section)

### Mammals

#### Sierra Nevada red fox *Vulpes vulpes necator*

**Status.** California threatened

**General Distribution.** The Sierra Nevada red fox is one of 10 currently recognized red fox subspecies in North America (Hall 1981). *Vulpes vulpes necator* is one of three subspecies of mountain red fox, along with the foxes of the Cascade Mountains (*V. v. cascadiensis*) and the Rocky Mountains (*V. v. macroura*) (Perrine et al. 2010). The Sierra Nevada red fox has historically been found throughout high elevations of the Sierra Nevada from Tulare County northward to Sierra County, and from Mount Shasta and Lassen Peak westward to the Trinity Mountains (Trinity County) (Grinnell et al. 1937). The Sierra Nevada red fox elevation range is approximately 1,200 meters to 3,600 meters (4,000 feet to 11,800 feet); it is seldom observed below 1,500 meters (4,900 feet) and most often is seen above 2,100 meters (6,900 feet) (Grinnell et al. 1937, Perrine et al. 2010). This fox occurs at low densities, even in areas of high relative abundance (Perrine et al. 2010). Current Sierra Nevada red fox distribution and range are uncertain (CDFG 1996); until recently, the Lassen Peak region accounted for the only verified contemporary detections of mountain red fox (Kucera 1993 and 1995, Perrine and Arnold 2001, Perrine 2005). In August 2010, biologists on the Humboldt-Toiyabe National Forest detected a Sierra Nevada red fox at an automatic camera station near Sonora Pass at an elevation of 3,048 meters (10,000 feet) along the border of Tuolumne and Mono counties. Since this detection, three (and possibly five) individual Sierra Nevada red foxes have been detected within 80 miles of this area, with the lowest detection at 1,828 meters (6,000 feet).

**Habitat Requirements.** The Sierra Nevada red fox occupied habitats are typical of the high Sierra Nevada: high-elevation barren, conifer, and shrub habitats, montane meadows, talus slopes, subalpine woodlands, and fell-fields (Perrine et al. 2010, Grinnell et al. 1937, Ingles 1965). Possible den sites include natural cavities in talus slopes or rockslides, earthen dens, boulder piles, or even the space beneath vacant cabins (Grinnell et al. 1937, Aubry 1983). In the winter, Sierra Nevada red foxes may follow the forested edge of openings, possibly avoiding areas where they would be exposed to attack by other carnivores, while ski tracks and other packed snow may also facilitate travel (Perrine et al. 2010). Red foxes are opportunistic predators and scavengers that eat a wide variety of foods, depending on their seasonal availability, including small and medium-sized mammals, birds, insects, invertebrates, fruit, carrion, and garbage (Perrine et al. 2010).

**Status in Merced River Corridor.** Until recently, the last verified Sierra Nevada red fox sighting (confirmed by photograph) near Yosemite National Park occurred during the winter of 1990-1991 at the Tioga Pass Resort 2,940 m (9,645 ft) on the Inyo National Forest, just outside the park (Les Chow, NPS Inventory and Monitoring Network, pers. comm.). However, in the last few years there have been

several more detections. In 2009, the CDFG began surveying high-elevation habitats in the southern Cascade and Sierra Nevada ranges for Sierra Nevada red fox with the goal of determining current red fox distribution as well as genetic make-up of existing individuals or populations. Using baited remote, motion-sensing camera stations and passive hair-snaring devices, a total of nine individual Sierra Nevada red foxes have been detected in high elevation wilderness areas in the Sierra (C. Stermer, Pers. Comm.). In April 2012, a Sierra Nevada red fox was detected on the northern border of Yosemite National Park near Dorothy Lake in Toiyabe National Forest. Surveys targeting other carnivores, such as *Martes*, are not adequate for detecting Sierra Nevada red fox (Perrine et al. 2010). Surveys in the park targeting red fox are being proposed; however, based on previous survey and sighting data, it is unlikely that a significant red fox population exists in Yosemite National Park.

## California State Fully Protected Species

### *Birds*

Bald eagle (see California State Endangered Species section)

#### Golden eagle *Aquila chrysaetos*

**Status.** California fully protected

**General Distribution.** Golden eagles occur across most of North America, ranging from high alpine habitats to low deserts. Nearly all nesting in the United States occurs west of the Great Plains, with the rest of the range used primarily by migrants (Palmer 1988). In California, they inhabit foothills, mountainous areas, sage-juniper flats, and desert habitats (Zeiner et al. 1990). In the Sierra Nevada, golden eagles favor grasslands and areas of shrubs or saplings, and open-canopied woodlands of young blue oaks. In late summer, they often range to above timberline (Zeiner et al. 1990). The golden eagle is a locally uncommon breeder at Yosemite.

**Habitat Requirements.** Golden eagles feed mostly on rabbits and rodents but may also take other mammals, birds, reptiles, and carrion. They hunt in meadows, clearings, rock outcroppings, granite shelves, fell-fields, talus, and other open or openly wooded habitats, but they avoid dense forests (Gaines 1992). They employ three main strategies to search for prey: soaring, still-hunting from a perch, and low contouring flight (Edwards 1969, Dunstan et al. 1978, Dekker 1985, Palmer 1988).

**Status in Merced River Corridor.** Golden eagle observations have been recorded on 273 occasions in Yosemite. Of these observations, there are 74 records from the Merced River corridor. These records span the years from 1915–2008. The majority of these observations are from locations in Yosemite Valley. Golden eagles have also been observed near Wawona Dome (1983) and at Washburn Lake (1940), as well as in the Merced Gorge between the Valley and El Portal (Yosemite Wildlife Observation Database 2011). Nevada Fall is a representative nesting location (Gaines 1992).

## Peregrine falcon *Falco peregrinus*

**Status.** California fully protected

**General Distribution.** Peregrine falcons can be found on nearly every ice-free landmass on earth. They will frequently migrate enormous distances; individuals from northern populations might travel 25,000 kilometers (15,530 miles) annually (White et al. 2002). In California, they breed along the coast as well as in most northern mountain ranges, including the Sierra Nevada (Polite and Pratt 1990). Peregrine falcon nests are often scrapes on ledges or cliffs, a habit they practice in the Valley on features like El Capitan and Glacier Point. The use of dichlorodiphenyltrichloroethane (DDT) as a pesticide in the mid-to-late 1900s decimated peregrine falcon populations, and as recently as 1981 there may have been as few as 39 breeding pairs in California (Monk 1981). Intensive management of peregrines falcons, including captive rearing, led to a resurgence of their populations in the last three decades. The peregrine falcon is a rare but regular breeder in Yosemite.

**Habitat Requirements.** Peregrine falcons will hunt in a wide variety of habitats, including meadows, woodlands, marshes, and mudflats, but typically nest on cliff ledges with expansive views (Gaines 1992). Peregrine falcons feed almost exclusively on birds, which are taken in flight. They require cliffs and ledges for cover and usually breed and hunt near water (Polite and Pratt 1990).

**Status in Merced River Corridor.** Peregrine falcon observations have been recorded on 118 occasions in Yosemite. Of those observations, 65 records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). The first documented peregrine sighting in Yosemite Valley was in 1940. Following this record are three observations from the summer of 1949, one of which involved two peregrines. In the 1950s and 1960s, DDT sent peregrine falcon populations plummeting all over the world. In 1972, the use of DDT was essentially banned; and in 1973, the peregrine was one of the first species to be listed under the federal ESA. By the early 1970s, peregrine falcons had all but disappeared in Yosemite. In 1978, rock climbers scaling the face of El Capitan in Yosemite Valley discovered nesting peregrine falcons; the first time in over 35 years that this species had been confirmed as breeding in the park. Since 1978, over 30 years ago, peregrine falcons have continued to recover in the park. Breeding surveys conducted in 2010 revealed eight active nests in Yosemite, the most ever documented in one season. Yosemite has a policy of temporarily closing rock climbing routes between March and August that pass through active peregrine falcon nesting sites.

## California State Rare Species

### *Plants*

#### Thompkins' sedge *Carex tompkinsii*

**General Ecology and Distribution.** This perennial herb in the sedge family is endemic to California and occurs in chaparral, foothill woodland, red fir forest, and yellow pine forest habitats at elevations of 1,200 to 1,800 meters.

*Habitat and Status in the Project Area.* It is found in canyon slopes and river bottomlands under conifer-oak woodland canopy. This species occurs in the El Portal area (Segment 4).

### **Congdon's woolly-sunflower** *Eriophyllum congdonii*

*General Ecology and Distribution.* This species, a native annual herb in the aster family, is endemic to California and restricted to Mariposa County. It is found on dry, mostly south-facing metamorphic and metasedimentary outcrops in chaparral and oak woodlands. It is endemic to the main stem of the Merced River canyon near El Portal and the South Fork of the Merced River downstream of Wawona.

*Habitat and Status in the Project Area.* Habitat for this species occurs on sunny rocky slopes next to the river in El Portal (Segment 4).

### **Congdon's lewisia** *Lewisia congdonii*

*General Ecology and Distribution.* This perennial herb in the montia family is endemic to California and occurs in chaparral, foothill woodland, red fir forest, and yellow pine forest. It is only found within Mariposa and Fresno Counties at elevations between 500 and 2,800 meters.

*Habitat and Status in the Project Area.* This species is known from approximately ten occurrences in the canyons of the Kings and Merced Rivers. In the Project Area, it occurs on metamorphic cliffs within lower montane coniferous forests in El Portal (Segment 3).

## **California State Species of Special Concern**

California wolverine (see Federal Candidate Species section)

Pacific fisher (see Federal Candidate Species section)

Yosemite toad (see Federal Candidate Species section)

Sierra Nevada yellow-legged frog (see Federal Candidate Species section)

## ***Fish***

### **Hardhead** *Mylopharodon conocephalus*

**Status.** California species of special concern

**General Distribution.** Hardhead are endemic to California and native to the Sacramento and San Joaquin River basins and the Russian River watershed. Hardhead are typically found in undisturbed

areas of larger middle- and low-elevation streams and rivers. This species ranges from sea level to 1,450 meters (4,750 feet) in elevation. Historically, hardhead were regarded as a widespread and locally abundant species. Hardhead still appear to be widespread in foothill streams, but their specialized habitat requirements combined with widespread alteration of downstream habitats has resulted in isolated populations making them more susceptible to local extinction (Moyle et al. 1995).

**Habitat Requirements.** Hardhead are typically found in undisturbed streams with clear, deep pools that have sand-gravel-boulder substrates and slow water velocities (Moyle et al. 1995). This species distribution might be limited to well-oxygenated streams because they are relatively intolerant of low oxygen levels, especially at higher temperatures (Cech et al. 1990). Most streams in which they occur have summer temperatures in excess of 20 °Celsius (C) (68 °Fahrenheit [F]); optimal temperatures for hardhead appear to 24–28 °C (75–82 °F).

**Status in the Merced River Corridor.** Hardhead observations have been recorded on two occasions in Yosemite, both from the Merced River. It is unlikely that hardheads occurred above El Portal on the Merced River. The Merced River gorge likely prevented them from migrating any farther up the river. The only documented observations of hardheads in the Merced River corridor were in 1987 and 2006 in El Portal (Stillwater Sciences 2008). Electrofishing surveys conducted by CDFG in 2008 at two sites in El Portal did not detect any hardhead.

### *Amphibians*

#### **Foothill yellow-legged frog** *Rana boylei*

**Status.** California species of special concern

**General Distribution.** Historically, foothill yellow-legged frogs occurred from the Santiam River (Marion County), Oregon, in the north to the San Gabriel Mountains (Los Angeles County), California (Hayes and Jennings 1988) in the south. They occupied the western slopes of the Cascade Mountains, the western foothills of the Sierra Nevada and Coast Ranges, and the Tehachapi and San Gabriel Mountains. An isolated population also occurred in the Sierra San Pedro Martir, Baja California, Mexico (Loomis 1965). Today, foothill yellow-legged frogs continue to occur across their historical range in Oregon and California but in greatly reduced numbers (Lannoo 2005). In California, they inhabit elevations from sea level to 1,939 meters (6,360 feet) (Hemphill 1952). The species is believed to have disappeared from 51% of its historic localities throughout its range and is estimated to have disappeared from approximately two-thirds of its historic localities within the Sierra Nevada (Hayes and Jennings 1996).

**Habitat Requirements.** Foothill yellow-legged frogs are primarily found in streams with riffles, rocky substrates, and open banks (Lannoo 2005). Adults have also been found in deep, isolated pools and vegetated backwaters (Hayes and Jennings 1988). Breeding and rearing habitat is located in gently flowing water where there is a reduced risk to egg masses and tadpoles from high water events and scouring (Kupferberg 1996a).



**Status in the Merced River Corridor.** There are only four recorded observations of foothill yellow-legged frogs in Yosemite. All four of those sightings were in Yosemite Valley and near Cascade Creek. The first specimen was collected near Cascade Creek in July 1948 (University of Michigan Museum of Zoology). Three additional observations were reported for Yosemite Valley in 1974 (Yosemite Wildlife Observation Database 2011). No individuals have been reported in the park since the mid-1970s, and the species is believed to be extirpated from the park. The low number of historic records is likely a reflection of the limited habitat for foothill yellow-legged frogs in the park.

## *Birds*

### **Northern goshawk** *Accipiter gentilis*

**Status.** California species of special concern

**General Distribution.** Northern goshawks occupy temperate and boreal forests throughout the Holarctic (Brown and Amadon 1968, Squires and Reynolds 1997). They are year-round residents throughout all or most of the California range, although in winter some individuals remain on or near breeding territories while others migrate short distances to winter elsewhere (Keane 1999). Throughout their range, they inhabit moderately dense coniferous forests broken by meadows and other openings, at elevations between 1,500 meters and 2,700 meters (4,920 feet and 8,860 feet). Northern goshawk is an uncommon year-round resident in Yosemite.

**Habitat Requirements.** Northern goshawks forage in mature and old-growth forests that have relatively dense canopies and open understories (Beier and Drennan 1997) but also hunt among a variety of vegetative cover, including meadow edges (Younk and Bechard 1994). Goshawks hunt from tree perches, scanning the ground and lower canopy for prey. As such, an open understory improves the chances of detection and capture of prey (Reynolds et al. 1992).

**Status in Merced River Corridor.** Northern goshawk observations have been recorded on 160 occasions in Yosemite. Of these records, 54 observations were in the Merced River corridor, mostly in Yosemite Valley. Besides in the Valley, one bird was seen in flight near Wawona Dome (1982), three were recorded from Little Yosemite Valley (1990, 1994), and two were recorded from Merced Lake (1982, 1990) (Yosemite Wildlife Observation Database 2011). Gaines (1992) indicates Little Yosemite Valley as a “representative nesting locality.”

### **Long-eared owl** *Asio otus*

**Status.** California species of special concern

**General Distribution.** The long-eared owl inhabits open and sparsely forested habitats across North America and Eurasia between 30° and 65°North latitude (Marks et al. 1994). Long-eared owls are found across most of the United States but are uncommon throughout their range. In the Sierra

Nevada, this species is found from blue oak savannah up to ponderosa pine and black oak habitats, usually in association with riparian habitats. In Yosemite, they are known to nest in riparian forests and oak-conifer woodlands (Gaines 1992). Long-eared owls will also use live oak thickets and other dense stands of trees for roosting and nesting (Zeiner et al. 1990). Long-eared owl is a rare summer resident and breeder at Yosemite.

**Habitat Requirements.** Long-eared owls nest in riparian, oak-conifer, and eastside pine and juniper forests in the Sierra Nevada, and are associated with edges between forests and grasslands or shrublands (Gaines 1992, Marks et al. 1994, Hunting 2008). These owls might be more numerous than is known; little is known of their population status, habitat requirements, and prey in the park (Gaines 1992).

**Status in Merced River Corridor.** In Yosemite, little is known about the status of the long-eared owl. During one year of meadow surveys for great gray owls, long-eared owls were detected at 5 out of 15 meadows (Keane et al. 2011); none of these meadows were within the Merced River corridor. The species has been recorded on 22 different occasions in Yosemite, of which only three records are from Yosemite Valley (Yosemite Wildlife Observation Database 2011). Long-eared owls are only known to have nested in the Valley on one occasion, and that bird was shot and collected by the Grinnell/MVZ survey in 1915. Two records are from the same date and general location (Yosemite School and Leidig Meadow, October 1, 1987).

### Vaux's swift *Chaetura vauxi*

**Status.** California species of special concern

**General Distribution.** Vaux's swifts breed from southwestern Canada through the western United States to Mexico, Central America, and northern Venezuela. In winter, northern migrant populations of this species overlap southern residents (Bull and Collins 2007). Vaux's swifts are an uncommon breeder in Yosemite.

**Habitat Requirements.** Vaux's swifts require older trees and hollow snags for nesting and roosting habitat. To maintain nest and roost trees over time, both live and dead large-diameter hollow trees should be maintained, as well as green trees with some indication of decay to replace those that fall or become unsuitable (Bull and Collins 2007).

**Status in Merced River Corridor.** Vaux's swift observations have been recorded on 24 different occasions in Yosemite. Of these observations, five records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). They are a rare summer resident in the Merced River corridor, although Gaines (1992) suspects that Wawona Meadow is a regular nesting site for them. Furthermore, Gaines (1992) suspects that Vaux's swifts are "thinly but widely distributed" through old-growth forests with suitable nesting sites, and that the many documentations of them near meadows may not reflect the true nature of their habitat preferences.

## Northern harrier

### *Circus cyaneus*

**Status.** California species of special concern

**General Distribution.** The northern harrier is found as a breeding species throughout North America and Eurasia (where it is called the hen harrier). It is a long-distance migrant, and its range extends from northern South America to breeding grounds north of the Arctic Circle (Macwhirter and Bildstein 1996). Throughout its range, the northern harrier favors open areas such as grasslands, meadows, wetlands, and agricultural clearings. Northern harrier is a rarely seen migrant that passes through Yosemite.

**Habitat Requirements.** Northern harriers nest on the ground and in winter will roost communally on the ground. Their densest populations on the breeding grounds are typically associated with large tracts of undisturbed habitats dominated by thick vegetation growth (Apfelbaum and Seelbach 1983, Toland 1986, Kantrud and Higgins 1992). Northern harriers winter in a variety of open habitats dominated by herbaceous cover, including upland grasslands, open-habitat floodplains, and freshwater marshes (Temeles 1986, Collopy and Bildstein 1987). They typically hunt by flying low over habitats while searching for mammals and small birds (Macwhirter and Bildstein 1996).

**Status in Merced River Corridor.** Northern harriers observations have been recorded on 47 occasions in Yosemite. Of these observations, 19 records are from the Merced River corridor (Yosemite Wildlife Observation Database 2011). The majority of the records are from meadows in Yosemite Valley during the fall. Three records are from Wawona; two of those observations were in the same location on the same day (Wawona Meadow, August 1, 1977), and one was from 2006. The earliest documentations of northern harriers in the Valley are two records from 1926 and 1928 (Gaines 1992). Following these records is an observation of two birds from 1954. Beginning in 1977, there are records of several northern harriers per decade in the Valley through 2006 (Yosemite Wildlife Observation Database 2011).

## Olive-sided flycatcher

### *Contopus cooperi*

**Status.** California species of special concern

**General Distribution.** The olive-sided flycatcher breeding range extends from Alaska across Canada south into the United States, where it occupies forested areas. In California, the general outline of its current breeding range is largely unchanged from historic range. However, local extirpations have been reported for a few areas (Marshall 1988, Raphael et al. 1988). The olive-sided flycatcher is well sampled by Breeding Bird Surveys, which show that while the species is still abundant in the state, populations declined steadily from 1968 to 2004 (Sauer et al. 2005). Likewise, migration data from Southeast Farallon Island also show significant declines over a 25-year period (1968–1992) (Pyle et al. 1994). Olive-sided flycatchers are a fairly common summer resident in Yosemite.

**Habitat Requirements.** Olive-sided flycatchers forage in unobstructed canopies with high perches (Altman and Sallabanks 2000). Grinnell and Miller (1944) described their foraging and singing-post perches as apical tips of snags that protrude above the surrounding canopy. Altman (1999) observed that most foraging took place from the upper third of trees or snags.

**Status in Merced River Corridor.** Olive-sided flycatcher observations have been recorded on 81 occasions in Yosemite. Of these observations, 15 records are from the Merced River corridor. The first recorded observations of olive-sided flycatchers in Yosemite Valley were in the 1920s. Between 1923 and 1939, there were nine observations of this species in the Valley. Four records are from the 1970s, with one of these being the sole Wawona observation. An observation at Washburn Lake from 1990 is the highest-elevation observation from the Merced River corridor (Yosemite Wildlife Observation Database 2011).

### **Black swift** *Cypseloides niger borealis*

**Status.** California species of special concern

**General Distribution.** Black swifts are found throughout the western United States and Canada, and as far south as Costa Rica. Despite their large range, black swift populations are poorly understood and probably small; fewer than 100 of their breeding sites have been documented (Lowther and Collins 2002). In California, their populations are focused in the central coast, the central and southern Sierra Nevada, and in the San Bernardino and San Jacinto mountains (Roberson and Collins 2008).

**Habitat Requirements.** In Yosemite, black swifts only nest near or behind waterfalls, although elsewhere in their range nests are found on sea cliffs or other sheer rock faces (Lowther and Collins 2002). Their primary food source during the breeding season are events of emergent winged ants, which in southern California accounts for as much as 90% of what adults feed a fledgling (Foerster 1987, Marin 1999, Rudalevige et al. 2003).

**Status in Merced River Corridor.** Black swifts have been observed on 32 occasions in Yosemite National Park. Of these observations, 21 records are from the Merced River corridor. Despite suitable habitat elsewhere in Yosemite, the vast majority of black swift observations in the park are in or near the main stem of the Merced River (Yosemite Wildlife Observation Database 2011). There is only one documented observation of a black swift in the Tuolumne River drainage (Hetch Hetchy Reservoir, 2001). In the 1920s, local naturalists located black swift nests near Yosemite Valley (Gaines 1992), and Grinnell and Miller (1944) indicate the Valley and other locations in Mariposa County as nesting sites. Bridalveil Fall is suspected to be one of only three sites in California where nesting populations of black swifts exceed 10 pairs (Roberson and Collins 2008). Gaines also indicates Nevada Fall as a nesting site.

### Yellow warbler *Setophaga petechia*

**Status.** California species of special concern

**General Distribution.** Breeding range of the yellow warbler extends over most of North America, and wintering range extends to northern South America. In California, yellow warblers breed over much of the state where suitable breeding habitat occurs. Some yellow warblers winter in extreme southern California. Yellow warbler is a locally common summer resident and regular breeder in Yosemite.

**Habitat Requirements.** Yellow warblers breed primarily in riparian woodlands from coastal, valley, and desert lowlands, up to 2,400 meters in elevation in the Sierra Nevada. Other breeding habitat types includes montane chaparral, ponderosa pine, and mixed conifer where substantial amounts of brush occur (Zeiner et al. 1990). In the Merced River corridor, they generally inhabit areas of willow and cottonwood.

**Status in Merced River Corridor.** Yellow warbler observations have been recorded on 53 occasions in Yosemite (Yosemite Wildlife Observation Database 2011). Of these observations, 24 records are from the Merced River corridor. The first documented observation of yellow warblers in Yosemite Valley was in 1926 (Gaines 1992). Gaines (1992) characterized the Valley and Little Yosemite Valley as representative nesting localities. In 2010, bird surveys detected 49 individual yellow warblers in Yosemite Valley and confirmed breeding based on two specific observations: (1) an adult carrying food for young and (2) recently fledged young.

### Harlequin duck *Histrionicus histrionicus*

**Status.** California species of concern

**General Distribution.** Harlequin ducks are found on both the western and eastern seabords of North America. In western North America, their breeding range extends from western Alaska and the northern Yukon south to the Sierra Nevada. From April to September, they migrate inland to breed along turbulent mountain rivers with vegetated banks for cover (Beedy 2008). At the conclusion of the breeding season, they move back to the coast where they forage in intertidal areas. Harlequin duck population decline has been noted across much of their range (Robertson and Goudie 1999). Harlequin duck is a rare breeder in Yosemite.

**Habitat Requirements.** Yosemite features the clear, fast-flowing river and stream conditions associated with the breeding grounds of harlequin ducks. These conditions include low acidity, steep banks, and substantial streamside vegetation (Beedy 2008). They feed primarily by diving into the water and searching among rocks for aquatic insects, although they will occasionally take fish (Robertson and Goudie 1999).

**Status in Merced River Corridor.** As of 2011, there are 43 records of harlequin ducks in Yosemite's Wildlife Observation Database. Of these records, 39 observations are from the Merced River corridor. According to Gaines (1992), harlequin ducks were found in every major Yosemite watershed from 1,200 meters in elevation to timberline until the 1920s. After an absence of nearly 20 years, a female harlequin was observed in Wawona in 1940 (Gaines 1992). It wasn't until 1977 that harlequins were again observed in the Merced River, and they were seen with some regularity until 1985. After a 15-year absence, harlequin ducks were documented repeatedly in the Merced River between 2000–2007 (Yosemite Wildlife Observation Database 2011).

### Great gray owl *Strix nebulosa*

**Status.** California Endangered

**General Distribution.** The great gray owl is a large forest owl that ranges across northern boreal and temperate forests in both North America and Eurasia. Throughout its circumpolar range, the species is considered rare. In California, great gray owls are restricted to the Sierra Nevada and southern Cascades. The core breeding distribution is centered on Yosemite and the immediately adjacent and surrounding Stanislaus, Sierra, and Sequoia National Forests (Winter 1986, Rich 2000, Keane et al. 2011). The Sierra Nevada population is the southernmost population in the world, with the closest known breeding population occurring in southern Oregon. An estimated 100 to 200 pairs of great gray owls occur in California, with a limited geographic distribution centered in Yosemite and adjacent National Forest lands in the central Sierra Nevada (Keane et al. 2011). Recent genetic work by Hull et al. (2010a) has revealed that the Yosemite population of great gray owls has been demographically isolated from other *S. nebulosa* populations for an extensive period of time, and the authors recommend designating a separate subspecies *S. n. yosemitensis* for the Sierra Nevada lineage. Genetic diversity also was extremely low for this subspecies, which is typical of recent population bottlenecks and likely attributable to habitat loss and fragmentation (Hull et al. 2010a). Given that *S. n. yosemitensis* is essentially restricted to Yosemite and immediate environs, this park is unequivocally imperative for the conservation of this subspecies (Hull et al. 2010a). The great gray owl is a rare year-round resident and regular breeder in Yosemite.

**Habitat Requirements.** In the Sierra Nevada, the owls require extensive, densely vegetated wet or moist meadows margined by old-growth coniferous forest from the mixed conifer through the red fir to the lower lodgepole pine zones (Siegel and DeSante 1999) between 750 meters to 2,700 meters elevation (Greene 1995). Great gray owls breed in conifer stands with large snags and high canopy closure in the immediate vicinity of a montane meadow. The vast majority of known nesting sites have been within 250 meters of a meadow, with most averaging 150 meters from the meadow's edge (Maurer 2006, Siegel 2006). In the greater Yosemite area, great gray owls tend to nest in large, broken-topped conifer snags, particularly red fir (*Abies magnifica*) or white fir (*Abies concolor*), and in lower elevations have also been found in black oak (*Quercus kelloggi*) (Greene 1995, Keane et al. 2011).

**Status in Merced River Corridor.** Great gray owl observations have been recorded on 204 occasions in Yosemite. Of these observations, 21 records are from the Merced River corridor. The majority of

these observations were in or around Wawona Meadow, with just five observations in Yosemite Valley (Yosemite Wildlife Observation Database 2011).

### California spotted owl *Strix occidentalis occidentalis*

**Status.** California species of concern

**General Distribution.** The California spotted owl ranges from the southern Cascades south throughout the entire Sierra Nevada and in the central Coast Ranges. Population density in Yosemite is higher than elsewhere in the Sierra Nevada. In Yosemite, owl density was estimated from 0.25 to 0.46 owls per square kilometer (km<sup>2</sup>) (1,000 square miles [m<sup>2</sup>]), whereas the mean density in surrounding areas in the Sierra Nevada was estimated from 0.10 to 0.21 km<sup>2</sup> (1,000 m<sup>2</sup>) (Roberts 2008). Although Roberts (2008) did not calculate home ranges, California spotted owl pairs in Yosemite [1 pair per 5.6 km<sup>2</sup> (3.48 m<sup>2</sup>)] exceeded the mean home range estimate throughout California [10.5 km<sup>2</sup> (6.52 m<sup>2</sup>)] (Zabel et al. 1992). Roberts (2008) estimated 315 spotted owl pairs in Yosemite, with 154 pairs in burned mixed-conifer forest and 161 pairs in unburned forest. Spotted owl is an uncommon year-round resident and regular breeder in Yosemite.

**Habitat Requirements.** The California spotted owl is strongly associated with areas of mature and old forest with thick canopy that contains many dense, old, live, and dead trees and fallen logs (Blakesley et al. 2005, Seamans 2005). Spotted owls prey mainly on small to medium-sized mammals, primarily rodents in the Sierra Nevada. It mostly consumes northern flying squirrels (*Glaucomys sabrinus*) in the higher elevations (conifer forests) and woodrats (*Neotoma* spp.) at lower elevations (burned mixed-conifer, oak woodlands, and riparian forests) and throughout southern California (Verner et al. 1992a, Roberts 2008). Downed woody debris in higher-elevation forests of the Sierra Nevada is strongly associated with underground fungi, which are important food for spotted owl prey species, such as northern flying squirrels (Davis and Gould 2008).

**Status in Merced River Corridor.** The Sierra Nevada offers the only extensive, nearly continuous habitat for the California spotted owl and is of critical importance for protecting this subspecies (Siegel and DeSante 1999). California spotted owl observations have been recorded on 72 occasions in Yosemite. Of these observations, 14 records are from the Merced River corridor. The first documented observation of a California spotted owl in Yosemite Valley was in 1940. Sightings of California spotted owls are sporadic in the Valley. Yosemite's wildlife observation database only contains one reference to a California spotted owl in Wawona in 1972 and one high-elevation observation at Merced Lake in 2004 (Yosemite Wildlife Observation Database 2011).

## Mammals

### Pallid bat *Antrozous pallidus*

**Status.** California species of special concern

**General Distribution.** The pallid bat is found from southern British Columbia and Montana to central Mexico and Cuba, and east to Texas, Oklahoma, and Kansas. Throughout California, the species inhabits primarily low to mid elevations, although it has been found up to 3,400 meters (11,000 feet) in the Sierra Nevada (Barbour and Davis 1969). Habitats range from desert to coniferous forest and nonconiferous woodlands. The pallid bat occurs in Yosemite, but its status is not well known. There are eight museum specimens for pallid bats for Yosemite, all from Yosemite Valley (Museum of Vertebrate Zoology Database 2011) collected between 1934 and 1940 (Pierson et al. 2006).

**Habitat Requirements.** This species is quite versatile in its choice of roosting sites and has been documented using tree hollows (both oak and ponderosa pine), rock crevices, caves, abandoned mines, and other anthropogenic structures such as buildings and bridges (Barbour and Davis 1969, Hermanson and O'Shea 1983, Lewis 1996, Orr 1954, Pierson et al. 1996, Pierson et al. 2001). This species is gregarious and roosts in nursery colonies of typically between 30 and several hundred individuals. The pallid bat feeds primarily on large, flightless arthropods such as scorpions, Jerusalem crickets, cicadas, wolf spiders, and centipedes (Pierson et al. 2006). Large cerambycid beetles, particularly *Prionus californicus*, and ten-lined June beetles (*Polyphylla decemlineata*) are also major prey items (Orr 1954, Pierson et al. 2004).

**Status in Merced River Corridor.** The pallid bat has been detected within the Merced River corridor in Yosemite Valley and in Little Yosemite Valley, and recent acoustic surveys by park biologists in 2010 have detected the pallid bat in El Portal, Little Yosemite Valley, and along the South Fork Merced River. In Yosemite, the species shows an association with oak habitat (Rainey and Pierson 1996), mixed deciduous forest (for example, in Yosemite Valley and Wawona), and giant sequoia habitat (Pierson and Heady 1996, Rainey et al. 1992, Pierson et al. 2006). This species occurs at elevations of at least 1,890 meters (6,200 feet) in Yosemite (Pierson and Rainey 1993, 1995, Pierson et al. 2001).

### Sierra Nevada mountain beaver *Aplodontia rufa californica*

**Status.** California species of special concern

**General Distribution.** The Sierra Nevada mountain beaver is endemic and restricted to western North America. Currently seven subspecies are recognized (Dalquest and Scheffer 1945, Hall 1981), including the isolated population *A.r. californica* that extends through much of the Sierra Nevada in eastern California into the western extreme portion of Nevada (Arjo 2007). Sierra Nevada mountain beavers can be found up to 3,000 meters (9,800 feet) in elevation in portions of the Sierra Nevada; however, they are more commonly found at lower elevations in humid, densely vegetated understory



areas (Feldhamer et al. 2003). Sierra Nevada mountain beavers are confined to well-vegetated, moist, cool environments and require a large daily intake of water due to their poor ability to concentrate urine and low tolerance for temperature extremes (Nungesser and Pfeiffer 1965).

**Habitat Requirements.** Sierra Nevada mountain beavers require abundant riparian plants for harvesting, but the species composition is relatively unimportant (Todd 1990). Good forage cover (e.g., ferns, forbs, and shrubs) as well as large amounts of small-diameter woody debris or uprooted stumps are usually found in areas selected by Sierra Nevada mountain beaver (Todd 1992, Hacker and Coblenz 1993). Willow (*Salix* sp.), alder (*Alnus* sp.), and fir (*Abies* sp.) dominate areas preferred by mountain beavers in the higher elevations of the Sierra Nevada (Arjo 2007).

**Status in Merced River Corridor.** Todd (1990) estimated that Sierra Nevada mountain beavers occupy approximately 200 to 550 sites in Yosemite. By extrapolating the number of Sierra Nevada mountain beaver sites to the numbers of animals, Todd (1990) estimated from 400 to 6,600 adults living in the park. Of the 41 sites Todd (1990) found occupied by mountain beaver, none fell within the Merced River corridor. Unverified sightings of Sierra Nevada mountain beaver within the corridor include the Civilian Conservation Corps (CCC) camp near El Capitan Meadow in 1993 and along the south fork of the Merced River in Wawona in 1960 (Yosemite Wildlife Observation Database 2011). Although no Museum of Vertebrate Zoology specimens have been taken from within the corridor, several were taken just outside the corridor at the head of Lyell Canyon in 1915 (Museum of Vertebrate Zoology Database 2011). More recently during the Grinnell Resurvey Project, a mountain beaver specimen was recorded from Indian Creek at Chinquapin (Moritz 2007). Mountain beaver sign was also observed along both Lyell Fork and Maclure Creek (at elevations of 2,987 meters to 3,200 meters or 9,800 feet to 10,500 feet) during the Grinnell Resurvey Project (Moritz 2007).

### **Townsend's big-eared bat** *Corynorhinus townsendii townsendii*

**Status.** California species of special concern

**General Distribution.** The Townsend's big-eared bat occurs throughout the west and is distributed from the southern portion of British Columbia south along the Pacific coast to central Mexico and east into the Great Plains, with isolated populations occurring in the central and eastern United States. In California, the majority of records are from low-to-moderate elevations, although the species has been found to almost 3,000 meters (9,800 feet) in elevation. In the Sierra Nevada, maternity colonies have been found to up over 1,500 meters (5,000 feet) in elevation. The Townsend's big-eared bat is concentrated in areas with mines (particularly in the desert regions to the east and southeast of the Sierra Nevada) or caves (in the northeast portion of California and karstic regions in the Sierra Nevada and Trinity Alps) as roosting habitat (Pierson and Fellers 1998).

**Habitat Requirements.** The Townsend's big-eared bat feeds primarily on small moths, with over 90% of its diet composed of lepidopterans. Foraging associations include edge habitats along streams, adjacent to and within a variety of wooded habitats (Fellers and Pierson 2002, Sherwin 2005). All known nursery sites in the Sierra Nevada occur at relatively low elevations (the highest being at

1,650 meters (5,400 feet) along the Yuba River), although males have been detected much higher (Pierson et al. 2001). Szewczak et al. (1998) reported two nursery roosts in the White Mountains at elevations higher than 1,700 meters (5,500 feet).

**Status in Merced River Corridor.** In Yosemite, Townsend's big-eared bats have been detected at Mirror Lake (Pierson and Rainey 1993), Wawona (Pierson and Rainey 1995), and at the barium mine on U.S. Forest Service (USFS) land in El Portal. This mine is fenced and protected from disturbance. This species was detected within the Merced River corridor at two sites in Yosemite Valley in 1996 and 2004. Acoustic surveys conducted by park biologists in summer of 2010 did not detect this species within the Merced River corridor.

### Spotted bat *Euderma maculatum*

**Status.** California species of special concern

**General Distribution.** Although considered one of North America's rarest mammals (Zeiner et al. 1990), the spotted bat is widely distributed throughout much of the western United States, with its range extending as far north as southern British Columbia and as far south as Durango, Mexico (Pierson et al. 2006). In the Sierra Nevada, spotted bats are widely distributed in habitats ranging from desert scrub to montane coniferous forest, with acoustic detections at elevations up to 3,000 meters (9,800 feet) (Pierson et al. 2006).

**Habitat Requirements.** Limited information suggests that spotted bats do not roost in colonies, predominantly in crevices in high cliff faces (Wai-Ping and Fenton 1989). Surveys in the Sierra Nevada suggest that they are most abundant in areas with fractured rock (Pierson and Rainey 1996, 1998a, b). The spotted bat is capable of long distance and rapid flight, thus foraging ranges can be large. Radio-tracking studies in Arizona documented this species traveling up to 40 kilometers each night (Chambers et al. 2005). In montane habitats, the spotted bat forages over meadows, along forest edges, or in open coniferous woodland. Spotted bats feed primarily on large [(5–12 millimeter (0.20 inch–0.47 inch))] moths, particularly noctuids (Chambers and Herder 2005).

**Status in Merced River Corridor.** Studies conducted in Yosemite have shown that spotted bats are relatively abundant in many areas where suitable cliff-roosting habitat is prevalent. The majority of detections are from relatively open foraging settings (such as wet meadows) at lower elevations (for example, Yosemite Valley and Wawona) and from a number of sites with elevations up to 3,000 meters (9,800 feet) (Pierson and Rainey 1993, 1995, 1996, Pierson et al. 2001). Yosemite Valley had the highest population of spotted bats of any location surveyed in California (Pierson and Rainey 1995, 1996). Surveys have revealed spotted bats foraging on the north side of El Capitan Meadow, just below El Capitan, Bridalveil Meadow, Leidig Meadow, and Ahwahnee Meadow (Pierson and Rainey 1993). Pierson and Rainey (1993) suggest that spotted bats roost on or near Half Dome and El Capitan. Acoustic surveys conducted in 2010 detected this species in Yosemite Valley, Little Yosemite Valley, Merced Lake, and along the South Fork Merced River.

### Western mastiff bat *Eumops perotis*

**Status.** California species of special concern

**General Distribution.** The subspecies of western mastiff bat that occurs in North America ranges from central Mexico across the southwestern United States (parts of California, southern Nevada, Arizona, southern New Mexico and western Texas) (Eger 1977, Bradley and O'Farrell 1967). The western mastiff bat is found along the west side of the Sierra Nevada, primarily at low to mid-elevations but has been detected up to 3,000 meters (9,800 feet) in the summer (Pierson et al. 2006).

**Habitat Requirements.** Western mastiff bats are found in a variety of habitats, from desert scrub and chaparral to montane coniferous forest. Its presence is determined by the availability of significant rock features offering suitable roosting habitat (Pierson et al. 2006). This species may forage in flocks, regularly 30 inches to 60 meters over the substrate and can forage considerable distances from their roosting sites (Siders 2005). Foraging habitats include dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest, grassland, agricultural areas, and high-elevation meadows surrounded by mixed-conifer forests (Siders 2005). The diet of western mastiff bats consists primarily of moths (*Lepidoptera*) but also includes beetles, crickets, and katydids (Siders 2005).

**Status in Merced River Corridor.** In Yosemite, western mastiff bats have been detected in Yosemite Valley in Bridalveil Meadow, El Capitan Meadow, Leidig Meadow, Cook's Meadow, Ahwahnee Meadow, Stoneman Meadow, Wosky Pond, and wetlands near Happy Isles. They were also detected in a few upland habitats east of El Capitan Meadow and Sentinel Beach Picnic Area (Pierson and Rainey 1995). A radio-telemetry study in 1996 detected a large colony in the cliffs west of Cascade Creek (Pierson 1997). Yosemite Valley has the highest population of the western mastiff bat of any locality surveyed in California (Pierson and Rainey 1995). In addition, the species has been captured in Wawona (Pierson and Rainey 1995). Acoustic surveys conducted in 2010 detected this species in El Portal, Yosemite Valley, Little Yosemite Valley, and Merced Lake.

### Western red bat *Lasiurus blossevillii*

**Status.** California species of special concern

**General Distribution.** The western red bat is broadly distributed from southern British Columbia in Canada, through much of the western United States, through Mexico and Central America, to Argentina and Chile in South America (Bolster 2005). In California, the majority of records are from the coastal areas from the San Francisco Bay Area south, plus the Central Valley and bordering foothills, with a limited number of records from southern California extending as far east as western Riverside and central San Diego Counties (Pierson et al. 2006). There are a few records from higher elevations and the east side of the Sierra Nevada (Constantine 1998, Pierson et al. 2000). Winter populations of both sexes are concentrated along the central and southern coast (Pierson et al. 1999).

Grinnell (1918) suggested that western red bats in California were sexually segregated in summer, with males moving to higher elevations, a pattern more recently noted in other species (e.g., Cryan et al. 2000). Western red bats (most likely males or nonreproductive females) have been documented at elevations up to 2,500 meters (8,200 feet) in the Sierra Nevada (Pierson et al. 2000 and 2001).

**Habitat Requirements.** Western red bats roost on the underside of overhanging leaves. Recent studies in the Central Valley found that summering populations (and breeding females) are substantially more abundant in remnant stands of cottonwood/sycamore riparian that extend greater than 50 meters (164 feet) back from the river than they are in younger, less extensive stands (Pierson et al. 1999). Red bats forage on a number of insect taxa and fly at both canopy height and low over the ground (Shump and Shump 1982). Studies have reported diets consisting of primarily small moths, in addition to a variety of other insects, primarily *Orthoptera* (Ross 1961) but also *Homoptera*, *Coleoptera*, *Hymenoptera*, and *Diptera* (Shump and Shump 1982).

**Status in Merced River Corridor.** The first record of a western red bat in Yosemite was the capture of three individuals (two adult males and one nulliparous female) over the South Fork Merced River on September 16, 1998. Since then, the species has been documented acoustically at multiple localities up as high as Siesta Lake at 2,422 meters (8,000 feet) (Pierson et al. 2001). Previous acoustic detections have been obtained in association with black cottonwood in both Yosemite and Sequoia National Parks; however, acoustic surveys conducted in 2010 did not detect this species within the Merced River corridor.

### Sierra Nevada snowshoe hare *Lepus americanus*

**Status.** California species of special concern

**General Distribution.** Sierra Nevada snowshoe hares inhabit the mid-elevations (914 meters to 2,133 meters [3,000 feet to 7,000 feet) of the northern and central Sierra Nevada from approximately Mount Lassen in southeastern Shasta County south through Yosemite National Park to Mono and Mariposa counties (Bolster 1998). They have also been recorded from Nevada in the general vicinity of Lake Tahoe (Hall 1946, Richardson 1954). The southern locality is north of Mammoth in Mono County (Bolster 1998). The population status of the Sierra Nevada snowshoe hare is poorly known.

**Habitat Requirements.** In California, the Sierra Nevada snowshoe hare is primarily found in montane riparian habitats with thickets of alders and willows, and in stands of young conifers interspersed with chaparral. The early seral stages of mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen are likely snowshoe hare habitats, primarily along edges and especially near meadows (Orr 1940, Ingles 1965). This species' abundance is highly cyclic in parts of its range, and may be in California as well, but there is little evidence. They prefer dense cover, either in understory thickets of montane riparian habitats or in shrubby understories of young conifer habitats. The snowshoe hares' summer food primarily consists of grasses, forbs, sedges, and low shrubs (Zeiner et al. 1990). They eat needles and the bark of conifers, and leaves and green twigs of willow and alder in the winter (Wolff 1980).

**Status in Merced River Corridor.** Sierra Nevada snowshoe hare favor dense streamside vegetation. This species typically occurs at elevations below 2,438 meters (8,000 feet); however, its upper elevation limits are unknown. There are a number of apparent sightings from Yosemite above 2,438 meters, although these have not been verified (Yosemite Wildlife Observation Database 2011). Other unconfirmed snowshoe hare sightings within the Merced River corridor include the Merced Lake Ranger Station in 1991 and at the junction of the Merced River and Echo Creek in 1990 (Yosemite Wildlife Observation Database 2011).

### **Western white-tailed jackrabbit** *Lepus townsendii townsendii*

**Status.** California species of special concern

**General Distribution.** The western white-tailed jackrabbit ranges from the high Sierra crest and upper east slope from the Mount Whitney region at elevations up to 3,657 meters (12,000 feet) in sagebrush, subalpine conifers, alpine dwarf-shrub, and grasslands; it is also found on flat areas east of the mountains, especially in winter.

**Habitat Requirements.** This species inhabits a variety of habitats, including sagebrush, perennial grasslands, alpine dwarf-shrub, and wet meadows to timberline and above, and early successional stages of a variety of conifer habitats, including lodgepole pine, yellow pine, western juniper, dwarf juniper, red fir, and mixed conifers (Verner and Boss 1980, Williams 1986, Zeiner et al. 1990). In most of these habitats, western white-tailed jackrabbits prefer open or sparsely wooded areas with young or stunted conifers, or scattered shrubs which they use for protective cover during the day (Grinnell and Storer 1924, Verner and Boss 1980, Harris 1982). During the spring through fall, they eat grasses and a variety of herbaceous plants, including cultivated crops (as encountered) (Zeiner et al. 1990). In winter, they prefer buds, bark, and twigs of shrubs, particularly sagebrush, creambush, and small trees (Bailey 1931, Orr 1937).

**Status in Merced River Corridor.** Unverified sightings of western white-tailed jackrabbit within the Merced River corridor include two sightings in Little Yosemite Valley in 1974 and 1975 and a sighting near Merced Lake in 1951 (Yosemite Wildlife Observation Database 2011).

### **Mount Lyell shrew** *Sorex lyelli*

**Status.** California species of special concern

**General Distribution.** The known range of this species spans a small area of the east-central Sierra Nevada, California, including areas in and around Yosemite in Tuolumne, Mariposa, and Mono counties, at elevations of 2,100 meters–3,150 meters (6,900 feet–10,350 feet) (Grinnell 1933, Williams 1984). This shrew might possibly occur in similar habitat from Mono County to Modoc County, but the area outside its known range has not been adequately surveyed. Recent surveys by the Grinnell Resurvey

Project in 2007 documented this species at the two original localities where it was recorded in the Grinnell era (upper Lyell Basin and Vogelsang Lake) (Moritz 2007). The Mount Lyell shrew was also found to have expanded its known range to the north, and to lower elevations, at Glen Aulin (2,408 meters [7,900 feet]), Kerrick Meadow (2,926 meters [9,600 feet]) and upper Return Creek in Virginia Canyon (3,018 meters [9,900 feet]). This species was found to be uncommon at each locality (Moritz 2007).

**Habitat Requirements.** Mount Lyell shrew specimens have been found primarily in wetland communities, near streams, in grassy areas, under willows, and in sagebrush steppe communities (Grinnell 1933, Williams 1984, Museum of Vertebrate Zoology Database 2011). This shrew requires moist soil (Ingles 1965) and uses logs, stumps, and other surface objects for cover (Grinnell and Storer 1924). This species eats insects and other invertebrates found while foraging on the ground, in stumps, and in logs (Grinnell and Storer 1924, Ingles 1965).

**Status in Merced River Corridor.** Surveys for the Mount Lyell shrew in and near Yosemite in 2003–2007 yielded specimens from several locations, one of which was within the Merced River corridor at Cathedral Pass in July 2007 (Museum of Vertebrate Zoology Database 2011). In addition, one male specimen was collected in July 1915 1.5 kilometer from the river corridor at the head of Lyell Canyon (Museum of Vertebrate Zoology Database 2011).

### American badger *Taxidea taxus*

**Status.** California species of special concern

**General Distribution.** American badgers are uncommon but found throughout most of California, irrespective of elevation, from the Central Valley over the Sierra Nevada east into the Great Basin. The badger is most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils (Zeiner et al. 1990).

**Habitat Requirements.** The American badger prefers open areas and may also frequent brushlands with little groundcover. During periods of inactivity, badgers occupy underground burrows. They frequently reuse old burrows, although some may dig a new den each night, especially in summer (Messick and Hornocker 1981). They are usually found in relatively dry grasslands and open forests (Rahme et al. 1995) and may be active at any hour but are mainly nocturnal. Badgers feed primarily on small rodents usually captured by digging out their burrows. Their main prey species includes ground squirrels, pocket gophers, kangaroo rats, prairie dogs, and mice. Badgers also eat reptiles, insects, earthworms, eggs, birds, and carrion, especially when ground squirrel populations are low (Messick and Hornocker 1981, Zeiner et al. 1990). The American badger is active all year, but it may sleep in its den for several days or weeks during severe winter weather (Nowak 2005).

**Status in Merced River Corridor.** Unverified American badger sightings within the Merced River corridor include the CCC Camp in El Capitan Meadow in 1993, at the Yosemite Valley Visitor Center in 1954 (Yosemite Wildlife Observation Database 2011), and in Wawona in 2004 (California Natural Diversity Database 2012).

## Western pond turtle *Emys marmorata*

**Status.** California Species of Special Concern

**General Distribution.** The historic range of western pond turtles included the Pacific slope from Puget Sound to Sierra San Pedro Martir in Baja California Norte and isolated inland populations in Washington, Oregon, California, Nevada, and Idaho. Some of these isolated populations may represent introductions (Holland 1994). Western pond turtles have an elevation range from sea level to about 2,042 meters (6,700 feet) but are uncommon anywhere above about 1,524 meters (5,000 feet) (Holland 1994). The species is believed to be declining throughout 75%–80% of its range primarily due to habitat loss, nonnative predators (bullfrogs, large-mouth bass, and possums), and overharvesting for food. According to Jennings and Hayes (1994), the western pond turtle still occurs in 90% of its historic range in the Central Valley and west of the Sierra Nevada, but in greatly reduced numbers.

**Habitat Requirements.** Western pond turtles inhabit a wide range of permanent and ephemeral aquatic habitats, including ponds, marshes, rivers, streams, and ditches (Stebbins 1985, Behler 2002). In rivers and streams, they usually occupy slow-moving, deep pools with rocky or muddy bottoms and abundant vegetation (Stebbins 1985, Behler 2002). There is also a high correlation between turtle abundance and availability of logs, boulders, vegetation mats, and mud banks to use as basking sites (Bury and Germano 2008). Emergent basking sites such as logs are preferred because they offer some protection from terrestrial predators and offer quick escapes into deep water. This species may also spend a substantial amount of time in upland terrestrial habitats. Terrestrial habitat includes basking sites and nesting habitat. Western pond turtles deposit their eggs on land, usually above the floodplain, up to several hundred feet from water. For nesting, gravid (with eggs) females tend to seek out open areas with sparse, low vegetation (annual grasses and herbs), low slope angle, and dry hard soil.

**Status in the Merced River Corridor.** Western pond turtle observations have been recorded on 16 occasions in Yosemite. Of these observations, there have only been two sightings of western pond turtles in the Merced River corridor; both sightings were in Yosemite Valley in the 1950s. In 1950, there was a sighting in Sentinel Meadow and, in 1958, another turtle was observed in Stoneman Meadow (CNDDDB 2012). There have been no sightings since the 1950s in the Merced River corridor, and the species is believed to be extirpated from the Merced River within Yosemite.

## Mount Lyell salamander *Hydromantes platycephalus*

**Status.** California species of special concern

**General Distribution.** The Mount Lyell salamander, endemic to the Sierra Nevada, ranges from the Sonora Pass (Sonora County) to Silliman Gap, Sequoia National Park (Tulare County). Isolated populations have also been documented in the Desolation Wilderness (El Dorado County) and on the Sierra Buttes (Sierra County). They inhabit high elevation (2,100 meters to 3,700 meters [6,890 feet to

12,139 feet]) snowmelt seep and waterfall habitat throughout the Sierra Nevada. There are also several populations of Mount Lyell salamander at lower elevations in the spray zones of waterfalls in Yosemite Valley (1,200 meters to 1,300 meters [3,937 feet to 4,265 feet]) and in riparian areas at lower elevation (1,400 meters to 2,000 [4,593 feet to 6,562 feet]) on the arid eastern slope of the Sierra Nevada, near the floor of the Owens Valley. The Owens Valley population was treated by CDFG as a separate species (Jennings and Hayes 1994), but recent genetics analysis does not support treating this as a separate species (Rovito 2009). Although the species has the broadest geographic range of any members of its genus *Hydromantes*, within that range, Mount Lyell salamanders may be very patchily distributed with small local populations that might be especially susceptible to local extirpation (Jennings and Hayes 1994). Consequently, they are a California species of special concern. According to Wake and Papenfuss in Lannoo 2005, there is no indication that either the size of the range or the density of this species has changed recently. In fact, new populations are continuing to be discovered. In Yosemite, the species has been observed at a number of sites in recent years.

**Habitat Requirements.** Juveniles and adults are commonly found in talus slopes of granite where water is flowing. They appear to favor habitats that are downslope of melting snowfields that persist long into or through the entire summer. Mount Lyell salamander may also be found near streams and within the spray zones of waterfalls, under rocks and moss. They are nocturnal and take refuge under rocks during the daytime.

**Status in the Merced River Corridor.** Mount Lyell salamander observations have been recorded on 140 occasions in Yosemite National Park. Of these observations, 24 records are from the Merced River corridor. Between 1950 and 1954, there were 12 observations at a site along the John Muir Trail between Yosemite Valley and Little Yosemite Valley, and at two sites in Yosemite Valley. In 1969 and again in 1995, there were single observations in Yosemite Valley. One individual was observed along the John Muir Trail between Yosemite Valley and Little Yosemite Valley in 1995. From 2000–2006, there were four sightings along the John Muir Trail between Yosemite Valley and Little Yosemite Valley and five sightings in Yosemite Valley (CNDDDB 2012). In 2006, there were also two individuals observed in Yosemite Valley immediately outside of the river corridor buffer.

## Park Rare Species

### *Plants*

#### Spurred snapdragon (*Antirrhinum leptaleum*)

*General Ecology and Distribution.* Spurred snapdragon, an annual herb, is endemic to California and limited to the seasonally moist areas in the foothill and Sierra Nevada counties between 300 and 1,200 meters.

*Habitat and Status in the Project Area.* The snapdragon is restricted to small washes and shallow ditches in disturbed areas in Foresta and Wawona.



**Lemmon's wild ginger (*Asarum lemmonii*)**

*General Ecology and Distribution.* This perennial herb in the birthwort family is endemic to California and is found in yellow pine forests, red fir forests, and wetland-riparian habitats within the park between 1,100 and 1,900 meters. It occurs almost always under natural conditions in wetlands.

*Habitat and Status in the Project Area.* Lemmon's wild ginger occurs in shady wet places along creeks and north-facing river banks; it is found in Yosemite Valley and Wawona.

**California bolandra (*Bolandra californica*)**

*General Ecology and Distribution.* This perennial herb in the saxifrage family is endemic to California and is restricted to lower and upper montane coniferous forests within the park, in mesic areas and rocky soils. It is restricted to elevations between 2,000-3,000 meters.

*Habitat and Status in the Project Area.* The California bolandra occurs at Lyell Fork of the Merced River in Segment 1 of the Merced River corridor.

**Threadleaf beakseed (*Bulbostylis capillaris*)**

*General Ecology and Distribution.* Threadleaf beakseed is a monocot annual herb in the sedge family; it is native to California and occurs in yellow pine forests and wetland-riparian habitats at elevations between 1,000-2,000 meters.

*Habitat and Status in the Project Area.* The threadleaf beakseed occurs in meadows and seeps, meadow habitats, and vernal moist areas. It is found in Yosemite Valley (Segment 2).

**Mono Hot Spring evening primrose (*Camissonia sierrae* ssp. *alticola*)**

*General Ecology and Distribution.* This annual herb in the evening primrose family is endemic to California and is found in lodgepole and red fir forests (lower and upper montane coniferous forests) in granitic, gravel and sand pans. The Mono Hot Spring evening primrose is found at elevations of 2,000-2,350 meters.

*Habitat and Status in the Project Area.* This evening primrose is found on vernal moist gravel and sand pans and at Merced Lake in Segment 1.

**Sierra suncup (*Camissonia sierrae* ssp. *sierrae*)**

*General Ecology and Distribution.* This annual herb in the evening primrose family is endemic to California and is restricted to cismontane woodlands and lower montane coniferous forests at elevations between 500 and 1,300 meters.

*Habitat and Status in the Project Area.* The milkvetch occurs on granite gravel seepage areas within Yosemite Valley.

**Buxbaum's sedge (*Carex buxbaumii*)**

*General Ecology and Distribution.* Buxbaum's sedge is a monocot and perennial herb in the sedge family. It occurs in montane and subalpine fens. It favors wet conditions in meadow habitats at elevations between 1,200-3,300 meters.

*Habitat and Status in the Project Area.* Buxbaum's sedge occurs in Yosemite Valley.

**Silvery sedge (*Carex canescens*)**

*General Ecology and Distribution.* This monocot, perennial herb belongs to the sedge family and is found throughout the Sierra Nevada as well as other mid- to high-elevation sites in North America. It occurs in meadow and perennially moist areas in subalpine and alpine forests at elevations between 1,000-3,200 meters.

*Habitat and Status in the Project Area.* The silvery sedge is found in lake margins and drainages in wet meadows. Historic collections were taken from Wawona, where this species is commonly found (Segment 7).

**Cleft sedge (*Carex fissuricola*)**

*General Ecology and Distribution.* This perennial herb in the sedge family is native to California, but is confined to western North America. It is found in red fir and subalpine forests and wetland-riparian habitats at elevations between 1,500 and 3,500 meters.

*Habitat and Status in the Project Area.* This sedge occurs in meadow slopes and flats, among rocks, wet areas, and spray zones. It is found at Nevada Falls within Segment 1.

**Yosemite sedge (*Carex sartwelliana*)**

*General Ecology and Distribution.* This perennial herb in the sedge family is endemic to California and occurs in yellow pine and red fir forests, as well as wetland-riparian habitats at elevations of 1,200 to 2,600 meters.

*Habitat and Status in the Project Area.* This sedge is found in meadow borders and moist forest openings. It can be found at Wildcat Creek and in Segments 1, 2, 5, and 7.

**Bolander's woodreed (*Cinna bolanderi*)**

*General Ecology and Distribution.* This perennial herb in the grass family is endemic to California and occurs in wetland-riparian habitat, but occasionally is found in non wetlands. It is found in elevations ranging between 1,670 to 2,440 meters.

*Habitat and Status in the Project Area.* Bolander's woodreed is found in montane stringer meadows and fens in Wawona and Little Yosemite Valley (Segments 7 and 1, respectively).

**Narrow leaf Collinsia (*Collinsia linearis*)**

*General Ecology and Distribution.* This annual herb in the plantain family is primarily limited to California, with some extensions into adjacent states. It is found in lower- to mid-elevation (200 to 2,000 meters) coniferous forests on rock outcrops and dry slopes. It reaches the southern extent of its range in Mariposa County.

*Habitat and Status in the Project Area.* Narrow leaf collinsia is found in El Portal and Wawona (Segments 4 and 7, respectively), where it is restricted to dry, metamorphic rock outcrops along the metamorphic-granitic contact zone.

**Short-bracted bird's beak (*Cordylanthus rigidus* ssp. *brevibracteus*)**

*General Ecology and Distribution.* Short-bracted bird's beak is an annual herb in the broomrape family and is endemic to California. It is widely distributed in the Sierra Nevada from Mariposa County southward to Kern County at elevations ranging between 1,100 to 2,500 meters.

*Habitat and Status in the Project Area.* This plant occurs on the north side of Yosemite Valley, where it receives full sun on dry sandy roadside habitats. Known populations occur one mile east of Cascade Creek in Segment 2 (Yosemite Valley).

**Mountain lady's slipper (*Cypripedium montanum*)**

*General Ecology and Distribution.* Mountain lady's slipper is a perennial herb in the orchid family; it is native to California and is confined to western North America in yellow pine forests, mixed evergreen forests, and wetland-riparian habitats at elevations between 200 to 2,200 meters. In the Sierra Nevada, it occurs in Tuolumne, Mariposa, and Madera Counties. It also occurs in northwestern California, the Cascade Range, southwest San Francisco Bay Area, and Modoc Plateau.

*Habitat and Status in the Project Area.* This herb occurs on deep humus and shade of canyon bottoms. It is found in Wawona and below Yosemite Valley.

**Stream orchid (*Epipactis gigantea*)**

*General Ecology and Distribution.* This species, a perennial herb in the orchid family, is widely distributed throughout California and North America. In Yosemite, it is restricted to moist granitic ledges and planted in landscaped areas at elevations between 1,500 to 2,600 meters.

*Habitat and Status in the Project Area.* This species occurs in Yosemite Valley within a number of landscaped areas. Former populations above Happy Isles were obliterated by the rockfall in 1996. Natural habitat for this species exists throughout the Valley in perennially moist, shaded areas.

**Purple fawn-lily (*Erythronium purpurascens*)**

*General Ecology and Distribution.* This perennial herb is endemic to California and the Sierra Nevada. It grows along shaded streams and river corridors in montane coniferous forests at elevations of 1,500 to 2,700 meters.

*Habitat and Status in the Project Area.* This species is known from riparian corridors in the eastern end of Yosemite Valley. It was collected in the past for its showy flowers and is possibly extinct.

**Northern mannagrass (*Glyceria borealis*)**

*General Ecology and Distribution.* This perennial herb in the grass family is native to California and is also found elsewhere in North America and beyond. It occurs in yellow pine and red fir forests, as well as wetland-riparian habitats. In Yosemite, it is found in elevations ranging between 800-1,250 meters.

*Habitat and Status in the Project Area.* Northern managrass grows in marshes and shallow lake borders in Yosemite Valley (Segment 2).

**California sunflower (*Helianthus californicus*)**

*General Ecology and Distribution.* This perennial herb in the aster family is native to California and is confined to western North America. It occurs in foothill woodland, valley grassland, freshwater wetlands, and wetland-riparian habitats at elevations ranging between 1,600 and 2,000 meters.

*Habitat and Status in the Project Area.* California sunflower grows along streambanks, within meadows and freshwater marshes, seeps, and seasonally inundated areas. It occurs in Wawona (Segment 7).

**Common mare's tail (*Hippuris vulgaris*)**

*General Ecology and Distribution.* This perennial aquatic herb in the plantain family is native to California but is also found elsewhere in North America and beyond. It occurs in a variety of habitats, including yellow pine, red fir, lodgepole, and subalpine forests; foothill woodland, chaparral, valley grassland, and wetland-riparian habitats at elevations ranging between 0 to 2,600 meters. It occurs almost always under natural conditions in wetlands.

*Habitat and Status in the Project Area.* This species occurs within lakes, ponds, springs, rivers in Little Yosemite Valley (Segment 1).

**Redray alpinegold (*Hulsea heterochroma*)**

*General Ecology and Distribution.* This perennial herb in the aster family is native to California and elsewhere outside of California, but is confined to western North America. It occurs in chaparral and openings in yellow pine forests between 300 and 2,500 meters in elevation.

*Habitat and Status in the Project Area.* This species occurs in Yosemite Valley and 5 miles above Nevada Fall (Segments 2 and 1, respectively).

**Western quillwort (*Isoetes occidentalis*)**

*General Ecology and Distribution.* This fern is native to California and belongs to the quillworts family. It occurs in wetland-riparian habitats in the high Sierra Nevada, Klamath Ranges within California at elevations between 1,500 and 2,500 meters. Outside of California, it can be found in British Columbia and Colorado.

*Habitat and Status in the Project Area.* Western quillwort occurs in mountain lakes and rivers. In the Project Area, it is found in Segment 1 (Little Yosemite Valley).

**Sierra laurel (*Leucothoe davisiae*)**

*General Ecology and Distribution.* This shrub, a perennial in the heath family, is found slightly beyond California's boundaries and is restricted to wetland, bog, and moist habitats at elevations between 1,300 and 2,600 meters.

*Habitat and Status in the Project Area.* Within the Merced River corridor, Sierra laurel is found in moist, shaded drainage bottoms along creeks and rivers within Yosemite Valley (Segment 2).

**False pimpernel (*Lindernia dubia* var. *anagallidea*)**

*General Ecology and Distribution.* This annual herb in the plantain family is found in freshwater wetlands and meadows at low to mid elevations (500 to 1,600 meters) in California and North America.

*Habitat and Status in the Project Area.* False pimpernel is found in meadow soils throughout Yosemite Valley (Segment 2) that remain moist for the duration of the plant's seasonal life span.

**Tanoak (*Lithocarpus densiflorus* var. *echinoides*)**

*General Ecology and Distribution.* Tanoak is a tree or shrub in the oak family and is native to California. It occurs on dry shady forest conditions in slope habitats at elevations ranging between 600 and 2,000 meters.

*Habitat and Status in the Project Area.* Tanoak occurs along the Merced River below Yosemite Valley (Segment 2) and in the El Portal area (Segment 3).

**Northern bugleweed (*Lycopus uniflorus*)**

*General Ecology and Distribution.* This perennial herb in the mint family is native to California and is also found elsewhere in North America and beyond. It occurs in freshwater wetlands and wetland-riparian habitat at elevations ranging between 1,600 and 2,000 meters.

*Habitat and Status in the Project Area.* Northern bugleweed occurs in moist areas, marshes, adjacent to springs, and along the Merced River banks from El Portal up to the Merced Gorge (Segments 4 and 3, respectively).

**Yellow and white monkeyflower (*Mimulus bicolor*)**

*General Ecology and Distribution.* Yellow and white monkeyflower, an annual herb from the lopseed family, is endemic to California. It occurs in foothill woodland, yellow pine forest, and chaparral habitats at elevations ranging between 360 and 2,100 meters.

*Habitat and Status in the Project Area.* This species occurs under vernal moist conditions, usually in non-wetlands, but occasionally found in wetlands and river bottomlands. In the Project Area, it is found in Wawona (Segment 7).

**Small flowered monkeyflower (*Mimulus inconspicuus*)**

*General Ecology and Distribution.* This annual herb in the lopseed family is endemic to California. It is restricted to wetlands and seasonally moist sites in lower montane forests and foothill woodlands in partial shade at elevations between 160 and 2,000 meters.

*Habitat and Status in the Project Area.* Small flowered monkeyflower occurs at the mouth of Moss Creek and also in Segments 2, 3, 7, and 8.

**Cutleaf monkeyflower (*Mimulus laciniatus*)**

*General Ecology and Distribution.* This annual herb in the lopseed family is endemic to California. It typically occurs in red fir and yellow pine forests and wetland-riparian habitats at elevations ranging between 900 and 2,000 meters.

*Habitat and Status in the Project Area.* Cutleaf monkeyflower occurs in chaparral, lower and upper montane coniferous forests, vernal moist seepage areas, and mesic areas with granitic substrate in Yosemite Valley (Segment 2).

**Yellow-lip pansy monkeyflower (*Mimulus pulchellus*)**

*General Ecology and Distribution.* This annual herb in the lopseed family is endemic to California and limited to Mariposa, Tuolumne, and Calaveras Counties. It is restricted to wetlands and seasonally moist sites at elevations ranging between 600 and 2,000 meters.

*Habitat and Status in the Project Area.* This species occurs in vernal mesic meadows and lower montane coniferous forests within Yosemite Valley (Segment 2).

**Sierra sweet-bay (*Myrica hartwegii*)**

*General Ecology and Distribution.* This perennial shrub in the wax-myrtle family is endemic to California. It is limited in occurrence to streambanks and riparian communities at low to moderate elevations (300 to 1,500 meters) in the Sierra Nevada, where it forms small thickets along the river.

*Habitat and Status in the Project Area.* Patchy distribution of Sierra sweet-bay occurs along the South Fork of the Merced River through Wawona as well as along tributaries to the South Fork and Big Creek near the South Entrance Station.

**California bog asphodel (*Narthecium californicum*)**

*General Ecology and Distribution.* This perennial shrub in the Nartheciaceae family and is endemic to California. It occurs along streambanks and in meadows within yellow pine, red fir, and douglas-fir forests, as well as wetland-riparian habitat. Elevation range for this species is between 700 to 2,600 meters.

*Habitat and Status in the Project Area.* This species occurs in fens, seeps, and adjacent to streams and waterfalls. In the Project Area, it can be found at Bridalveil Falls in Yosemite Valley (Segment 2).

**Azure penstemon (*Penstemon azureus* ssp. *angustissimus*)**

*General Ecology and Distribution.* This perennial herb in the plantain family is endemic to California and is near its southern extent in Yosemite. It is generally found in moist woodlands and open forests at lower to moderate elevations in the Sierra Nevada at elevations of 300 to 700 meters.

*Habitat and Status in the Project Area.* This herb is found in scattered locations in Yosemite Valley (Segment 2). It was first described from collections taken in Yosemite Valley, although that original population appears to have disappeared.

**Purdy's foothill penstemon (*Penstemon heterophyllus* var. *purdyi*)**

*General Ecology and Distribution.* This perennial herb in the plantain family is endemic to California. It is generally found under dry conditions in slope habitats of chaparral, foothill woodland, and yellow pine forest habitats. It occurs at elevations of 50 to 1,600 meters.

*Habitat and Status in the Project Area.* This penstemon occurs in Yosemite Valley (Segment 2).

**Tansy Leafed Phacelia (*Phacelia tanacetifolia*)**

*General Ecology and Distribution.* This annual herb in the borage family is found throughout California and is confined to western North America. It grows in seasonally moist, sandy and gravelly open areas.

*Habitat and Status in the Project Area.* This species occurs at scattered locations throughout Yosemite Valley at elevations of 1,000 to 2,000 meters, where it blooms and sets seed early each spring.

**Coleman's piperia (*Piperia colemanii*)**

*General Ecology and Distribution.* This perennial native herb is endemic to California and limited to the high North Coast Ranges, high Cascade Range, and the Sierra Nevada. It grows on sandy substrates in lower montane coniferous forests and are also found in chaparral habitat at 1,200-2,300 meters in elevation.

*Habitat and Status in the Project Area.* This species occurs in Little Yosemite Valley (Segment 1).

**Torrey's popcornflower (*Plagiobothrys torreyi* var. *torreyi*)**

*General Ecology and Distribution.* This annual herb in the borage family is endemic to California and occurs in Mariposa, Fresno, and Kern Counties. Suitable habitat include meadows within yellow pine, red fir, and lodgepole pine forests, as well as subalpine forests at elevations ranging between 1,200 and 3,400 meters.

*Habitat and Status in the Project Area.* This herb is found within moist meadows and flats, as well as forest edges within Yosemite Valley (Segment 2).

**Nuttall's pondweed (*Potamogeton epihydrus* (previously *P. ephydrus* ssp. *nuttallii*))**

*General Ecology and Distribution.* This perennial herb in the pondweed family is native to California at elevations ranging between 400 and 1,900 meters; it occurs in the outer North Coast Ranges, high Sierra Nevada, Modoc Plateau, and elsewhere in North America.

*Habitat and Status in the Project Area.* Nuttall's pondweed is restricted to freshwater wetlands and wetland-riparian habitats. In Yosemite Valley (Segment 2), it can be found in freshwater marshes and tanks.

**Valley oak (*Quercus lobata*)**

*General Ecology and Distribution.* This tree is endemic to California and occurs throughout California, with the exception of eastern California and desert areas.

*Habitat and Status in the Project Area.* Valley oak occurs on deep soil on slopes and in valleys. It is known from a few majestic specimens in El Portal (Segment 4) at elevations of approximately 720 meters.

**Wood saxifrage (*Saxifraga mertensiana*)**

*General Ecology and Distribution.* This perennial herb in the saxifrage family is endemic to California and limited to the northern and central Sierra Nevada at elevations of 1,000 to 2,500 meters. It reaches its southern extent in Mariposa County, where it grows on mossy rocks and moist cliffs in lower to montane coniferous forests.

*Habitat and Status in the Project Area.* This species occurs at scattered locations in moist, shaded sites throughout Yosemite Valley (Segment 2).

**Oregon saxifrage (*Micranthes oregana* (previously *Saxifraga oregana*))**

*General Ecology and Distribution.* This perennial herb in the saxifrage family is native to California but is also found in other areas of western North America. It occurs in meadows within yellow pine, red fir, lodgepole pine, and subalpine forests, as well as wetland-riparian communities at elevations of 150 to 2,500 meters.



*Habitat and Status in the Project Area.* This species occurs in meadows and seeps, almost always under wet conditions, in Yosemite Valley and Little Yosemite Valley (Segments 2 and 1, respectively).

**Bolander's skullcap (*Scutellaria bolanderi*)**

*General Ecology and Distribution.* This perennial herb in the mint family is endemic to California. It is primarily found in lower montane forests in the Sierra Nevada, where it occurs in gravelly soils along streambanks and in California black oak woodlands and ponderosa pine forests at elevations between 300-2,000 meters.

*Habitat and Status in the Project Area.* This species is known from isolated populations scattered throughout the Wawona basin (Segment 7).

**Clark's ragwort (*Senecio clarkianus*)**

*General Ecology and Distribution.* This perennial herb in the aster family is endemic to California and occurs in red fir and lodgepole forests, as well as wetland-riparian habitats at elevations ranging between 1,400 and 2,700 meters.

*Habitat and Status in the Project Area.* It occurs in damp montane meadows within Wawona (Segment 7).

**Small bur reed (*Sparganium natans*)**

*General Ecology and Distribution.* This perennial herb in the Typhaceae family is native to California, but is also found elsewhere in North America and beyond. It occurs at lake margins and edges of freshwater wetlands and wetland-riparian habitats at elevations ranging between 2,000 and 2,500 meters.

*Habitat and Status in the Project Area.* This species is found in tributaries of the Merced River in Segments 2 and 7 (Yosemite Valley and Wawona, respectively).

**Sierra bladdernut (*Staphylea bolanderi*)**

*General Ecology and Distribution.* This tree or shrub belongs to the Staphyleaceae and is endemic to California; it occurs in canyons within chaparral, foothill woodland, and yellow pine forest communities at elevations between 240 and 1,720 meters.

*Habitat and Status in the Project Area.* This species occurs in shaded canyon habitats along the Merced River Canyon in El Portal and the Merced Gorge Area (Segments 4 and 3, respectively).

**Narrowleaf trillium (*Trillium angustipetalum*)**

*General Ecology and Distribution.* This perennial herb in the Melanthiaceae family is almost entirely restricted to California. It is most common in the coastal ranges of the state, but occurs in limited,

small populations in the Sierra Nevada where it is found in shady areas within mature montane coniferous forests with well-developed duff and litter layers. Elevations range from 100 to 2,000 meters. This species may be at risk due to the lack of natural fire patterns, which allows an unnatural buildup of duff and litter to the exclusion of the plant, as well as overly intense fire behavior resulting in loss of root and plant materials through overheating.

*Habitat and Status in the Project Area.* This species is scattered over a 10-acre area along the south side of the South Fork of the Merced River in Wawona (Segment 7), near the eastern end of River Road. It also occurs in Yosemite Valley (Segment 2).

**California red huckleberry (*Vaccinium parvifolium*)**

*General Ecology and Distribution.* This shrub belongs to the heath family and is endemic to California. It occurs in canyons within redwood forest, red fir forest, and mixed evergreen forest communities at elevations between 1,400 and 2,500 meters.

*Habitat and Status in the Project Area.* This species prefers moist, shaded drainage bottoms along creeks and rivers. It occurs in Wawona (Segment 7).

**Hall's wyethia (*Wyethia elata*)**

*General Ecology and Distribution.* This species, a perennial herb in the aster family, is endemic to California. It is restricted to the southern Sierra Nevada foothills and lower montane forests at elevations between 1,000 and 1,400 meters and reaches the northern extent of its range in Yosemite.

*Habitat and Status in the Project Area.* It is found in open woodlands and forests in the Wawona basin (Segment 7).

## CHAPTER V. ENVIRONMENTAL EFFECTS

### Methods Used to Assess Effects

#### *Assumptions*

The following assumptions were used as a basis in the analysis of effects on special-status species:

- The greater the size of a biotic community and the stronger its links to neighboring communities, the more valuable it is to the integrity and maintenance of biotic processes that sustain special-status species. Development limits the size of a community and fragments and disassociates communities from each other.
- The more developed areas become, the less valuable they are as habitat for special-status species. New development would increase human presence and increase the potential for soil, wildlife, and vegetation disturbance. The potential for negative wildlife interactions (such as human injury from wildlife and the introduction of unnatural food sources) also would increase. If development were removed from an area, the value of the habitat for special-status species would increase. In some cases, the dispersal of visitors over a wider area that may follow removal of developed facilities may well have a greater impact than focused visitor use within the well-defined area of development. Human effects can also improve habitat quality for non-native species and unnaturally increase the abundance of some native species, both of which can have an adverse effect on special-status species.
- The presence of humans and the effects of human food on the behavior, distribution, and abundance of wildlife species would continue in existing developments.
- Roads can change water inflow and outflow patterns and may dewater sections of meadow or wetland habitat (USFS 1996). Roads can also cause mortality of wildlife and may form barriers and fragment wildlife habitat.
- Development and effects in riparian zones may influence critical water quality elements such as temperature, suspended sediments, and nutrients. These elements interact in complex ways in aquatic systems and directly and indirectly influence patterns of growth, reproduction, and migration of aquatic organisms.
- Development that has an adverse effect on habitat features that are important to certain special-status species (e.g., particular plant species upon which a species relies, or habitat features that define suitable habitat for a species) can have an acute, negative effect on those species.
- Radiating effects of human use can affect use of habitats adjacent to developed areas by special-status species, even though such habitats are not directly affected by the development.
- Implementation of threatened or endangered species recovery plans and other formal agreements between the U.S. Fish and Wildlife Service and the National Park Service would not be affected by the management direction resulting from the *Merced River Plan/DEIS*. The current management direction for special-status species would continue to remain in effect.

### ***Special-Status Plants***

The assessment of effects on special-status plants was based on the following:

- The sensitivity of the individual species to effects (based on the rarity, resilience, size of population, and extent of the species throughout the park)
- The location of the species in relation to the Preferred Alternative

### ***Special-Status Wildlife***

The assessment of effects on special-status wildlife was based on the following:

- The possibility of a species or its preferred habitat occurring in those areas expected to be affected
- The direct loss of habitat
- The partial loss of habitat from its modification
- The species' sensitivity to disturbance from human activities that may alter use of habitats in areas adjacent to development

Habitat fragmentation was also a critical component of the analysis. Restored blocks of habitat should be large enough to support viable populations, and intact habitat must not be reduced or affected to the point that it will no longer support viable populations.

### ***Impact Analysis***

Impacts on special status species from actions proposed in the *Merced River Plan/DEIS* were evaluated in terms of the context, intensity, duration, and type of impact, as defined below. Generally, the methodology for natural resource impact assessment follows direction provided in the *Council of Environmental Quality Regulations for Implementing the National Environmental Policy Act*, Section 1508.27.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the Merced River. This analysis will further identify if there would be local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area within Yosemite National Park. Regional impacts would have an influence in a Sierra-wide context. Context suggests that certain impacts depend on the setting of the proposed action. For instance, impacts that would reduce the connectivity between habitat types could be minor if such connections are abundant in a given region, moderate or major if they are not.
- **Intensity.** Impacts can be adverse or beneficial. A negligible impact means that special status species would not be affected, or effects would not be measurable. A minor impact would be

detectable; both short-term and long-term impacts could potentially affect breeding success and habitat availability. Mitigation measures would be sufficient to offset minor adverse effects. A moderate impact would be readily apparent and would result in the reduction or expansion of potential habitat required to meet life requisite needs of one or more species. Mitigation would be required to offset moderate adverse impacts. A major impact would be readily apparent and would result in the direct or indirect gain or loss of occupied breeding sites, take of individuals, or changes to habitat affecting potential for occupancy or reproductive potential. Extensive mitigation would be necessary to offset adverse effects and its success could not be guaranteed. Impacts to rare, threatened, and endangered species would be quantified where possible by determining the acreage of habitat for each species altered. The amount of each habitat type that would be directly affected would be determined by a comparative analysis of suitable habitat spatial data representing existing conditions and conditions under proposed management actions. Effects associated with habitat distribution and patch size will also be addressed quantitatively where baseline data are available to support such an analysis. Other potential direct and indirect effects to rare, threatened, and endangered species habitats, such as effects associated with invasive species or the potential for disturbance to populations due to increases in human activity, will be analyzed qualitatively.

- **Duration.** A short-term impact would have an immediate effect on native habitat, diversity, and native populations but would not cause long-term declines in populations or diversity. Short-term impacts are normally associated with transitional types of activities, such as facility construction. Long-term impacts would lead to a loss of native habitat, diversity, and species populations as exhibited by a decline in species abundance, viability, and/or survival.
- **Type.** The type of impact considers whether the impact would be beneficial or adverse. Adverse impacts are those that alter the range, location, number, or population of a species or its habitat. Beneficial impacts would improve one or more of these characteristics.

### *Cumulative Analysis*

Cumulative effects on rare, threatened, and endangered species discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region. The intensity of impact depends on whether the impacts are anticipated to interact cumulatively. For example, factors external to the park, such as broad regional habitat loss and pesticide use, can combine with existing, in-park impacts, such as from nonnative species, to cause declines in rare, threatened, or endangered amphibians (such as Sierra Nevada yellow-legged frog and Yosemite toad), which would be an adverse, cumulative impact. The projects identified below are those that have the potential to affect populations of rare, threatened, or endangered species (i.e., within the Merced River corridor) as well as large-scale or regional populations of the same species.

### **Past Actions**

Natural habitats in Yosemite have been manipulated almost since the beginning of the park. Regional wildlife and vegetation patterns have been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of nonnative species. Mammal species that survive but are extremely rare are the Pacific fisher and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by visitor activity but are present

in less disturbed areas of the park. Willow flycatchers no longer nest in the Valley—probably due as much to parasitism by brown-headed cowbirds as to destruction of riparian and meadow habitat. Amphibians in Yosemite have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellers 1996). Red-legged frogs likely were found in the Valley in the past but are now are presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, Sierra Nevada yellow-legged frogs and Yosemite toads are still present in a number of areas but are severely reduced in population and range. Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; known and possible causes include habitat destruction, nonnative fish, pesticides, and diseases. Past and ongoing activities that affect rare, threatened, or endangered species include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

In 1991, the USFS and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* for the main stem Merced River and South Fork Merced River that are under their jurisdiction; this plan is also a general management plan with many prescriptive goals and few actions. The plan endeavors to limit or end consumptive uses such as grazing within the river corridor and calls for the formalization of camping and launch facilities for nonmotorized watercraft. Implementation of these actions has a beneficial effect by eliminating impacts where feasible (grazing does not currently occur within the river corridor), concentrating impacts in areas able to withstand visitor use, and providing facilities that mitigate adverse effects associated with visitor use (e.g., restrooms).

Past projects and plans that could have a cumulative effect on special status species in the Merced River Wild and Scenic corridor include the following:

***Management and Restoration*** – *South Fork and Merced Wild and Scenic River Implementation Plan*, Cascades Diversion Dam Removal, Cook’s Meadow Ecological Restoration, Fern Springs Restoration, Happy Isles Dam Removal, Happy Isles Fen Habitat Restoration Project, Happy Isles Gauging Station Bridge Removal, Merced River Ecological Restoration at Eagle Creek Project

## Present Actions

Current facility-related projects and plans that could have a cumulative effect on special status species include the following:

***Facility Development*** – Crane Flat Utilities, *East Yosemite Valley Utilities Improvement Plan/Environmental Assessment*, Wauhoga Indian Cultural Center, Parkwide Communication Data Network, South Entrance Station Kiosk Replacement, Tioga Road Rehabilitation

Beneficial impacts of present management and restoration actions are similar to those discussed for past actions. Specific examples of present projects and plans with beneficial effects include the following:

***Management and Restoration*** – *Yosemite Vegetation Management Plan*, General Ecological Restoration, 2004 *Fire Management Plan/EIS*, Fuels reductions/forest rehabilitation projects (USFS), *Tuolumne Wild and Scenic River Comprehensive Management Plan*

### **Reasonably Foreseeable Future Actions**

Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on regional special status species include:

- changing demographics of visitors in Yosemite
- climate change
- concessioner parking lot restoration
- Restoration of the Mariposa Grove Ecosystem
- *Yosemite Wilderness Stewardship Plan/EIS*

### **Federal Endangered Species**

#### ***Wildlife***

##### **Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*)**

**Direct and Indirect Effects.** There would be no direct or indirect effects on the Sierra Nevada bighorn sheep or its preferred habitat. Habitat for the Sierra Nevada bighorn sheep is located in steep terrain in the northeastern portion of Yosemite Park, outside of the Merced River corridor. Additionally, most of the herd inhabits lands outside of the Park. No development would occur within suitable habitat for this species. Therefore, there would be no direct or indirect effects on the Sierra Nevada bighorn sheep.

**Cumulative Effects.** Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service) and 2009 Fire Management Plan could provide benefits to the size, integrity, and connectivity of suitable habitat for the Sierra Nevada bighorn sheep. These regional plans would have a long-term, moderate, beneficial effect on the Sierra Nevada bighorn sheep.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Sierra Nevada bighorn sheep.

## Federal Threatened Species

### Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

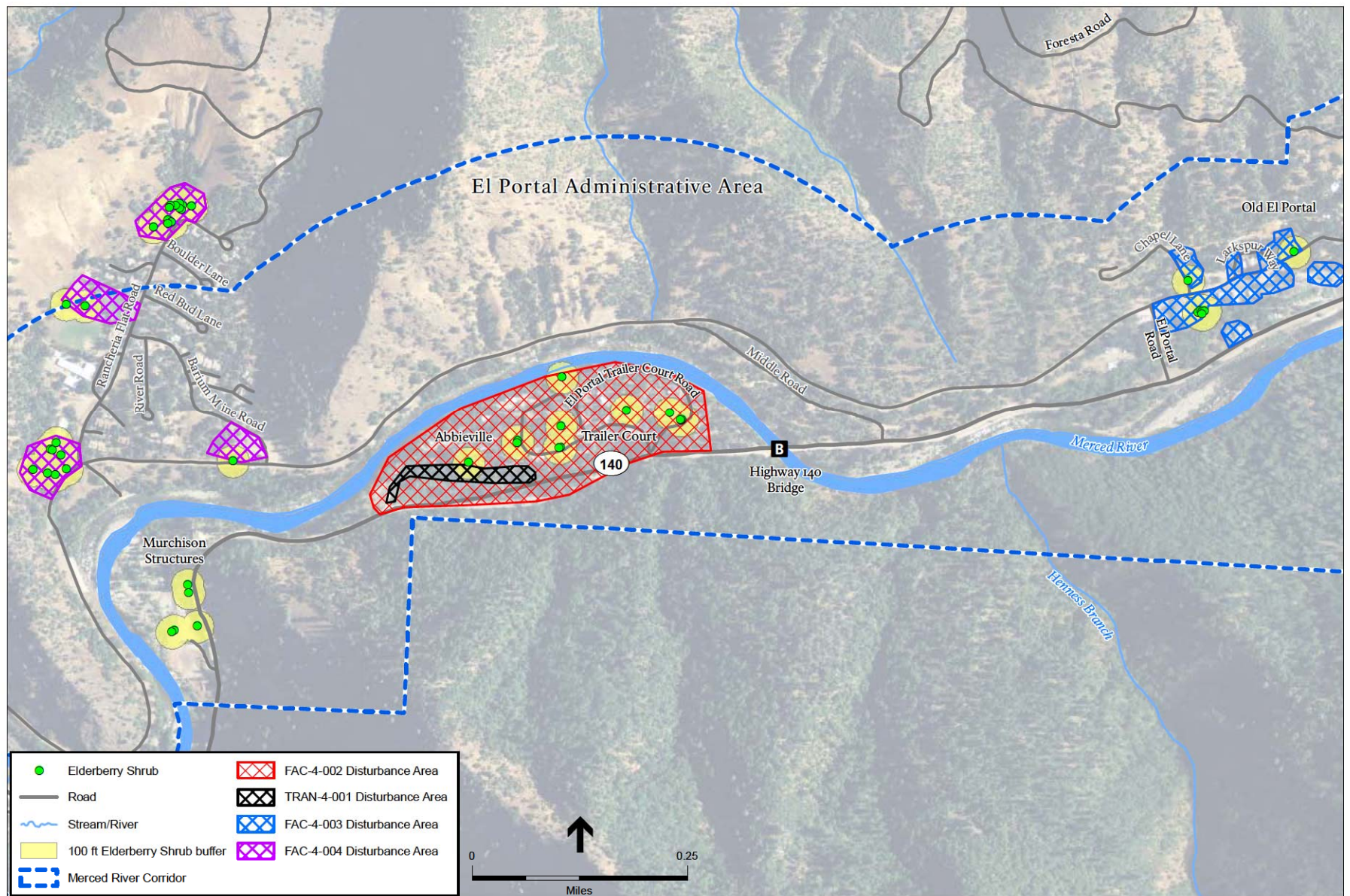
**Direct and Indirect Effects.** Potential Valley elderberry longhorn beetle habitat is defined by the presence or absence of elderberry plants in areas below 3,000 feet in elevation. Potential habitat for this species occurs in Segments 3 and 4 (Merced Gorge and El Portal, respectively), generally in riparian areas; however, activities that have the potential to affect Valley elderberry longhorn beetle would only occur in Segment 4 (El Portal, see figure N-1).

Approximately 124 elderberry plants of a size sufficient to support the Valley elderberry longhorn beetle occur in areas of potential development or management activities in El Portal. Valley elderberry longhorn beetle exit holes that verify beetle activity were found in 11 of these elderberry plants, though beetle larvae could still be present in elderberry plants without exit holes. Actions in Segment 4, including moving temporary housing units to El Portal and development at the Abbieville and Trailer Village, would result in potential indirect or direct impacts on elderberry shrubs, including removal of shrubs. Approximately 37 elderberry plants were documented within potential areas of ground disturbance, seven with exit holes. Complete impact avoidance would not be possible for these plants. The infill in El Portal would affect up to nine elderberry shrubs with stems greater than one inch in diameter. The development at Abbieville would affect up to 16 shrubs, while the development at Trailer Village would affect up to 12 shrubs as proposed in the *Merced River Plan/DEIS*. However, planning and implementation would strive to minimize effects to riparian vegetation and shrubs that are retained in the area. For example, new employee housing would be constructed outside of the 100-year floodplain to avoid impacts to riparian vegetation. Nevertheless, shrubs retained adjacent to proposed developed areas could be subject to future damage from human activities, such as unauthorized pruning and vehicles.

Direct or indirect impacts on valley elderberry longhorn beetle habitat would result in adverse effects to this species. To minimize and avoid potential effects where possible, NPS will implement avoidance and mitigation measures outlined in the 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Conservation Guidelines) (mitigation measure MM-WL-4, as applicable; see Appendix C). The Conservation Guidelines prescribe conservation measures to avoid and minimize adverse effects on the valley elderberry longhorn beetle, including specific procedures for transplanting, requirements to plant additional seedlings or cuttings and associated native species, protective measures, maintenance, and reporting.

Using the measures outlined in the Conservation Guidelines, the NPS estimates that 37 elderberry plants would need transplanting, 174 additional seedlings or cuttings would need to be planted, along with 101 associated native plants. In addition, a 1.53 acre Habitat Conservation Area would be required to protect transplants and establish required associated native plants. The NPS proposes to establish a 1.53 acre Habitat Conservation Area at the Greenemeyer Sand Pit, pending confirmation from the USFWS (see Appendix C for details).





SOURCE: NPS, 2011, 2012; NAIP, 2012

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**Figure N-1**

**Segment 4 – Elderberry Shrubs**

Ecological restoration actions occurring in El Portal include riparian revegetation and removal of abandoned utilities and facilities. Additionally, no new development would occur within 150 feet of the river. These actions combined would result in long-term beneficial effects to the Valley elderberry longhorn beetle, as this species' primary habitat occurs within riparian habitat.

**Cumulative Effects.** Foreseeable projects that could have adverse effects on the Valley elderberry longhorn beetle and its habitat include the Utilities Master Plan/East Yosemite Valley Utilities Improvement Plan and Parkwide Communication Data Network. These projects would have the potential to damage or destroy elderberry plants and directly affect local Valley elderberry longhorn beetle populations.

Long-term, beneficial effects would be expected from the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service) because these planning efforts could lead to greater protection of elderberry plants.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on valley elderberry longhorn beetle.

## Federal Candidate Species

### *Wildlife*

#### Yosemite toad (*Bufo canorus*)

**Direct and Indirect Effects.** The areas of likely occurrence of Yosemite toads in the study area, based upon previous observations and collections, are in high-elevation meadows and lakes in Segment 1 (Merced River above Nevada Fall) and Segment 5 (South Fork Merced River above Wawona). The Yosemite toad is regarded as a high-elevation species. There is a single historic record of this species in Yosemite Valley that places it approximately 2,500 feet below its usual range. It is unlikely that this record reflects the sustainable range of Yosemite toads. The proposed actions within Segments 1 and 5 are primarily ecological restoration actions, and thus would result in direct and indirect negligible effects to the Yosemite toad. Meadow restoration, cessation of pack stock grazing, and re-routing trails outside of sensitive meadow habitat would result in long-term, beneficial effect to the Yosemite toad. Meadow restoration at the Merced Lake High Sierra Camp area would also have long-term beneficial impacts on Yosemite toads.

Overall, effect of the Preferred Alternative on Yosemite toads is expected to be long-term, local and beneficial.

**Cumulative Effects.** Projects that have an appreciable effect on high-elevation meadow habitats are most likely to affect the Yosemite toad. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable habitat for the Yosemite toad. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the Yosemite toad include the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Yosemite toad.

#### **Sierra Nevada yellow-legged frog (*Rana sierrae*)**

Suitable habitat for this species occurs in Segments 1 (Merced River above Nevada Fall) and 5 (South Fork Merced River above Wawona) in high elevation lakes, ponds, and streams near the South Fork above Wawona. The proposed actions within these segments are primarily ecological restoration actions, and thus would result in direct and indirect negligible effects to the Sierra Nevada yellow-legged frog. Meadow restoration, cease of pack stock grazing, and re-routing trails outside of sensitive meadow habitat would result in beneficial effect to the Sierra Nevada yellow-legged frog as these habitats often form direct connections to other aquatic habitats (e.g., lakes and streams). Meadow restoration at the Merced Lake High Sierra Camp area would result in beneficial effect to Sierra Nevada yellow-legged frog.

Overall, effect of the Preferred Alternative on Sierra Nevada yellow-legged frog is expected to be long-term, local and beneficial.

**Cumulative Effects.** Projects that have an appreciable effect on high-elevation aquatic habitats are most likely to affect the Sierra Nevada yellow-legged frog. Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic

Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve water quality and habitat for the Sierra Nevada yellow-legged frog. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the Sierra Nevada yellow-legged frog include the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Sierra Nevada yellow legged frog.

#### **California wolverine (*Gulo gulo luteus*)**

**Direct and Indirect Effects.** Wolverines typically inhabit semi-open terrain at or above the timberline from spring through fall, and then move to lower-elevation forests in winter. They have been seen in a variety of habitats, including treeless barrens, alpine meadows, and mixed coniferous forests (Thelander et al. 1994). The most important habitat characteristic appears to be a low level of human disturbance (Thelander et al. 1994).

The Merced River corridor supports wolverine habitat in Segments 1 and 5 (Merced River above Nevada Fall and South Fork Merced River above Wawona, respectively). Proposed actions within these two segments primarily involve ecological restoration of meadow habitat. Additionally, given existing low level of development and apparent scarcity of wolverines in the Sierra Nevada, ecological restoration activities at these two segments would be expected to result in negligible effects to the species during restoration activities. Overall, impacts on wolverines under the Preferred Alternative would be beneficial following habitat restoration.

**Cumulative Effects.** Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service) and 2009 Fire Management Plan could provide benefits to the size, integrity, and connectivity of suitable habitat for the California wolverine. These regional plans would have a long-term, moderate, beneficial effect on suitable habitat, depending upon the extent of their implementation over time.

Given the high-elevation occurrence of wolverines and their aversion to human contact, no foreseeable projects would have an effect on this species.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would

have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on California wolverine.

#### **Pacific fisher (*Martes pennanti*)**

**Direct and Indirect Effects.** Fisher habitat in the Merced River Corridor is primarily conifer and mixed conifer forests in Segments 1, 2, 5, and 7 (Merced River above Nevada Fall, Yosemite Valley, South Fork Merced River above Wawona, and Wawona, respectively). Although some suitable habitat for Pacific fisher occurs in Segment 2, this species is highly sensitive to human presence and would not likely utilize habitats in Yosemite Valley. Proposed actions in Segments 1 and 5 are primarily ecological restoration actions, and thus would have a negligible effect on Pacific fishers during implementation and beneficial effect following restoration. Proposed actions in Wawona include removing select campsites and retaining current facilities and services, which would continue to affect wildlife in general. However, there are no proposed actions which would remove suitable fisher habitat (large trees and snags within coniferous or mixed forests).

Proposed actions to manage visitor use and facilities in Segment 2 would occur at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Potential foraging habitat for Pacific fisher may be affected by proposed construction and reorganization activities in the near-term in these areas, including direct loss of ponderosa pine (34.04 acres) habitat. Near-term actions in Segments 1 at the Merced Lake High Sierra Camp would retain the camp, reduce capacity of beds, and replace flush toilets with composting toilets. In Segment 7, near-term actions would remove campsites that are within the 100-year floodplain or in culturally sensitive areas at the Wawona Campground area. All of these actions would occur near currently developed areas that receive relatively high levels of human disturbance. Because, this species is sensitive to human presence, it is therefore not likely to occur in potentially affected areas. Thus, these actions would not likely result in any direct or indirect effects to the Pacific fisher.

**Cumulative Effects.** Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service) could provide benefits to the fisher.

The Utilities Master Plan/East Yosemite Valley Utilities Improvement Plan and Parkwide Communication Data Network, projects may have an adverse effect on fisher habitat.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Pacific fisher.



### Whitebark pine (*Pinus albicaulis*)

**Direct and Indirect Effects.** Whitebark pine is generally found in high-elevation upper montane and subalpine forests in Segments 1 (Merced River above Nevada Fall) and 5 (South Fork Merced River above Wawona). The proposed actions in Segments 1 and 5 are primarily ecological restoration actions in meadows and wetlands that generally do not require the removal of conifers, and thus would result in no adverse effects to the whitebark pine. Meadow and wetland restoration, cessation of pack stock grazing, and re-routing trails outside of sensitive meadow and wetland habitat in Segments 1 and 5 would result in no beneficial or adverse effects to the whitebark pine as these activities generally occur outside of whitebark pine habitat (forests).

Overall, no adverse or beneficial effect on whitebark pine is expected as a result of the implementation of the Preferred Alternative.

Actions at the Merced Lake High Sierra Camp in Segment 1 would retain the camp, reduce capacity of beds, and replace flush toilets with composting toilets. It is unlikely that proposed actions in Segment 1 would affect whitebark pine because the actions would occur outside the elevation range for whitebark pine.

**Cumulative Effects.** Whitebark pine is rapidly declining throughout most of its range, and recent monitoring and research results suggest that whitebark pine mortality may be increasing in California due to mountain pine beetle outbreaks (Gibson et al. 2008). Other factors that contribute to whitebark pine decline include white pine blister rust from a fungal pathogen, fire suppression, and climate change (by predisposing trees to insect and pathogen attacks and enabling white pine blister rust to expand to higher elevations) (Millar et al. 2012)

Projects that have an appreciable effect on high-elevation forest habitats are most likely to affect the whitebark pine. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), and Tuolumne Wild and Scenic River Comprehensive Management Plan could improve habitat conditions for whitebark pine. Particularly, fire management designed to remove late-successional trees and favor whitebark pine may reduce competition from other conifer species for suitable openings for seed germination. These actions could have long-term, beneficial effects on whitebark pine, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the whitebark pine include the Parkwide Communication Data Network and Tioga Road Rehabilitation.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on whitebark pine.

## California State Endangered Species

### *Wildlife*

#### **Bald eagle (*Haliaeetus leucocephalus*)**

**Direct and Indirect Effects.** Bald eagles are rarely seen within Yosemite and are not known to nest in the park. However, riparian and meadow areas of Yosemite Valley, El Portal, and Wawona may provide foraging habitat for transient eagles. Actions proposed in this plan, such as the restoration of meadow and riparian habitat, would increase the size, integrity, and connectivity of potential habitat for this species. This would have a beneficial impact on potential foraging habitat for the bald eagle. Upland habitats are not the primary habitats used by the bald eagle, and the size of the proposed new developments in Yosemite Valley, El Portal, and Wawona, are relatively small in relation to the range of the bald eagle. Therefore, development and fragmentation in upland habitats would have negligible effects on this species. There would be a relatively large amount of restoration of meadow and riparian habitat in relation to development in upland habitats; therefore, the Preferred Alternative would have an overall long-term, beneficial effect on the bald eagle.

Proposed actions to manage visitor use and facilities in Segment 2 would occur at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. In Segment 7, actions would remove campsites that are within the 100-year floodplain or in culturally sensitive areas at the Wawona Campground area. The facility actions in Segments 2 and 7 would not likely directly or indirectly affect the bald eagle because this species is a rare visitor to the park. Preconstruction surveys would be conducted to ensure no active raptor nest sites are affected by the proposed actions.

**Cumulative Effects.** Regional and parkwide planning efforts such as the Yosemite Vegetation Management Plan, Invasive Plant Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, Fire Management Plan could improve the size, integrity, and connectivity of suitable habitat for the bald eagle.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on bald eagle.

#### **Great gray owl (*Strix nebulosa*)**

**Direct and Indirect Effects.** In the Sierra Nevada, great gray owls nest in mature red fir, mixed conifer, or lodgepole pine forests near wet meadows or other vegetated openings. Suitable great gray owl habitat occurs in forested areas near meadows within Yosemite Valley and Wawona (Segments 2 and 7, respectively). Although some suitable habitat for great gray owl occurs in Segment 2, this species is highly sensitive to human presence and would not likely utilize habitats in Yosemite Valley.

Overall, the Preferred Alternative would result in beneficial effects to great gray owl and their habitat as a result of a substantial amount of restored high-quality habitat in Yosemite Valley and Wawona.

**Cumulative Effects.** Projects that have an appreciable effect on mid-elevation forest and meadow habitats are most likely to affect the great gray owl. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging and nesting habitat for the great gray owl. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the great gray owl include those that affect forest and meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements. The 2009 Fire Management Plan and Fuels reductions/forest rehabilitation projects (U.S. Forest Service) may affect great gray owls during plan implementation.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on great gray owl.

#### **Willow flycatcher (*Empidonax traillii*)**

**Direct and Indirect Effects.** Habitat loss and alteration is likely the greatest cause of willow flycatcher's decline in the west (NatureServe 2009). Within the Sierra Nevada, habitat degradation due to historic and/or ongoing grazing of riparian and meadow habitats appears to be associated with population declines (Siegel et al. 2008). Other threats such as climate change, altered fire regimes, and invasive species can also lead to habitat degradation indirectly. Willow flycatchers are particularly vulnerable to brood parasitism by brown-headed cowbirds (*Molothrus ater*). Willow flycatchers are at greater risk of cowbird brood parasitism where pack stations, corrals, supplemental feed, livestock holding facilities, livestock herds, campgrounds, picnic areas, rural communities or other brown-headed cowbird-associated locations occur within at least 8 km of occupied willow flycatcher sites (Rothstein et al. 1980, Verner and Rothstein 1988). Brownheaded cowbirds are frequently observed in Yosemite taking advantage of unnatural food sources at pack stations, stables, campgrounds, and in park residential areas.

Willow flycatchers have not been observed in Yosemite Valley for over 30 years, and are seen on rare occasions elsewhere in the park. The species is typically found in meadows with a lush growth of willow shrubs. Riparian and meadow restoration within Yosemite Valley and Wawona would increase



the size, integrity, and connectivity of potential habitat for this species and increase the chances for its recolonization.

Proposed actions to manage visitor use and facilities in Segment 2 would occur at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. In Segment 7, actions would remove campsites that are within the 100-year floodplain or in culturally sensitive areas at the Wawona Campground area. The facility actions in Segments 2 and 7 would not likely directly or indirectly affect the willow flycatcher because this species rarely occurs in Yosemite Valley and elsewhere in the park.

Overall, these actions would result in a beneficial effect on the willow flycatcher due to the large amount of suitable habitat that would be restored in Yosemite Valley and Wawona.

**Cumulative Effects.** Projects that would cause degradation of meadow habitat or increased abundance of brown-headed cowbirds would adversely affect willow flycatchers through respective habitat loss and nest parasitism.

Regional and parkwide planning efforts such as the Yosemite Vegetation Management Plan, Invasive Plant Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, Fire Management Plan could improve the size, integrity, and connectivity of suitable habitat for the willow flycatcher. Implementation of these plans could help restore habitats, control the effects of grazing, and reduce cowbird abundance by reducing fragmentation of forest communities.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on willow flycatcher.

#### **Sierra Nevada bighorn sheep (*Ovis Canadensis sierra*)**

Refer to the Federal Endangered Species section, above.

### **California State Threatened Species**

#### ***Wildlife***

#### **California wolverine (*Gulo gulo luteus*)**

Refer to the Federal Candidate Species section, above.

### Sierra Nevada red fox (*Vulpes vulpes necator*)

**Direct and Indirect Effects.** Expansion of non-native lowland red foxes or coyotes into high elevation areas may result in increased competition and potential transmission of harmful diseases and parasites to Sierra Nevada red foxes (Perrine et al. 2010). Interbreeding with non-native red foxes may reduce genetic adaptation to local conditions (Perrine et al. 2010) and damage genetic integrity of the native subspecies. Development and recreation, resulting in increased exposure to humans, vehicles and pets, and possibly facilitating dispersal of non-native red foxes, coyotes and other competitors are additional threats (Perrine et al. 2010). Habituation and begging habits may increase risk of mortality at roads and campgrounds, while fish poisoning disease may result from stocking infected fish for recreational fisheries (Perrine et al. 2010). Diseases from domestic animals, including rabies and distemper, and parasites, such as trematodes, can also cause significant mortality in red fox populations (Perrine et al. 2010). Rodenticides used for vegetation or livestock management purposes may result in secondary poisoning (Perrine et al. 2010). Climate change may reduce or change important habitat features in their boreal environment, such as reduced snowfall (Perrine et al. 2010).

The Merced River corridor supports Sierra Nevada red fox habitat in Segments 1 and 5 (Merced River above Nevada Fall and South Fork Merced River above Wawona). Proposed actions in Segments 1 and 5 are primarily ecological restoration actions, and thus would have negligible, direct and indirect effects on Sierra Nevada red fox during construction and beneficial effect following restoration.

Facility-related actions at the Merced Lake High Sierra Camp in Segment 1 would include reducing capacity of beds and replacing flush toilets with composting toilets. These actions would result in negligible effects on the Sierra Nevada red fox.

**Cumulative Effects.** Regional and parkwide planning efforts such as the Yosemite Vegetation Management Plan, Invasive Plant Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, Fire Management Plan could improve the size, integrity, and connectivity of suitable habitat for red foxes. These actions could have long-term, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Sierra Nevada red fox.

### Golden eagle (*Aquila chrysaetos*)

**Direct and Indirect Effects.** The greatest outside threat to golden eagle populations stems from interactions with humans and human-built structures (Steel et al. 2011). In particular, collisions with structures and electrocution by power lines cause the majority of non-natural Golden Eagle deaths (Steel et al. 2011). Such interactions could have detrimental effects to golden eagle populations in

Yosemite. Overall, the relatively intact habitats in Yosemite are beneficial to golden eagles, and recent large fires in the park have likely expanded the area of suitable foraging habitat by providing more open terrain.

Although golden eagles have been seen over most of the park, the areas of potential development under the Preferred Alternative that contain the most suitable habitat include Yosemite Valley and El Portal. The following are assessments of potential effects to golden eagles in these locations:

***Yosemite Valley*** – Restoration of meadow and riparian habitats would improve habitat quality for golden eagles under the Preferred Alternative. Even with this restoration, however, the terrain of Yosemite Valley would be marginal habitat for golden eagles, compared to other areas in the park (e.g., Merced River canyon). Effects in Yosemite Valley would be beneficial.

***El Portal*** – Development of housing, parking, and operations in this location would primarily affect wooded areas near the bottom of the Merced River canyon, which is not preferred golden eagle habitat. Most development would occur in or adjacent to areas with existing or previous development. These factors, coupled with the abundance of golden eagle habitat at higher elevations in the canyon, indicate that the impact on golden eagles under this alternative would be negligible.

Proposed actions to manage visitor use and facilities in Segment 2 would occur at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Proposed actions would not occur in golden eagle preferred habitat (open terrain and early successional forest and shrub habitats; large trees in open habitats or canyons) and thus would not likely affect golden eagles. Additionally, trees that would potentially serve as suitable golden eagle nesting habitat are generally located near developed sites. Thus, it is not anticipated that golden eagle nest sites would occur in proximity to areas with near-term actions. Preconstruction surveys would be conducted to ensure no active nest sites are affected by the proposed actions. Overall, effects of the Preferred Alternative on golden eagles would be beneficial, due primarily to restoration of habitats in Yosemite Valley.

**Cumulative Effects.** Regional and parkwide planning efforts such as the Yosemite Vegetation Management Plan, Invasive Plant Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, Fire Management Plan could improve the size, integrity, and connectivity of suitable habitat for golden eagles. These regional plans would have a long-term beneficial effect on golden eagles.

Foreseeable facility development projects that could have an adverse effect on golden eagles include the Crane Flat Utilities, East Yosemite Valley Utilities Improvement Plan, and Wauhatchie Indian Cultural Center. These projects, in total, would have a minor, adverse effect on golden eagles, because of the limited area they would affect.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on golden eagle.

### American peregrine falcon (*Falco peregrinus anatum*)

**Direct and Indirect Effects.** Enough high-quality habitat exists in the river corridor to sustain a healthy population of peregrine falcons; primary threats to them include predation on young by golden eagles and great horned owls and competition with ravens for nest sites. Other threats include disturbances posed by helicopters during search and rescue flights or medical evacuations and conflicts between nesting falcons and rock climbers.

The Merced River corridor supports peregrine falcon habitat in Segments 1, 2, 3, 5, and 7. Proposed actions in Segments 1, 3 and 5 are primarily ecological restoration actions, and thus would have a negligible, direct and indirect effect on peregrine falcon during implementation and a beneficial effect following restoration.

Restoration of meadow and riparian habitats in Yosemite Valley would have a beneficial impact on potential foraging habitat for the peregrine falcon. Development in Yosemite Valley associated with the preferred alternative could have a short-term adverse impact during periods of construction. Construction would not take place when the peregrine falcon is nesting or foraging in the vicinity of Cathedral Rocks. Development in forested habitats in Yosemite Valley and Wawona would have a negligible effect on peregrine falcons because this habitat type is abundant in these locations, and the falcon prefers to hunt in open areas such as along cliff faces and over meadows and water.

Proposed actions at the Merced Lake High Sierra Camp in Segment 1 would retain the camp, reduce capacity of beds, and replace flush toilets with composting toilets. Proposed actions to manage visitor use and facilities in Segment 2 would occur at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. In Segment 7, actions would remove campsites that are within the 100-year floodplain or in culturally sensitive areas at the Wawona Campground area. All of these actions would occur near currently developed areas that receive relatively high levels of human disturbance.

The proposed actions in Segment 2 and 7 would not occur in suitable nesting habitat for peregrine falcons. However, construction-related noise and human presence may cause peregrine falcons to temporarily avoid certain areas for foraging, such as wet meadow and woodland habitats. Actions in Segment 1 are not likely to affect peregrine falcon as these actions would occur outside of peregrine falcon nesting and foraging habitat. Overall, effects of the Preferred Alternative on peregrine falcons would be beneficial, due primarily to restoration of habitats in Yosemite Valley.

**Cumulative Effects.** Regional and parkwide planning efforts such as the Yosemite Vegetation Management Plan, Invasive Plant Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, Fire Management Plan could improve the size, integrity, and connectivity of suitable habitat for peregrine falcons. These actions could have long-term, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and

spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on peregrine falcon.

#### **Bald eagle (*Haliaeetus leucocephalus*)**

Refer to the California State Endangered Species section, above.

### **California State Rare Species**

#### ***Plants***

##### **Thompkins' sedge (*Carex tompkinsii*)**

**Direct and Indirect Effects.** Habitat for Thompkins' sedge occurs in Segment 4 (El Portal). There would be no direct effects on Thompkins' sedge as a result of the Preferred Alternative. Continued and increased use of the El Portal area could result in indirect adverse effects to this species as a result of increased population and associated foot traffic. Non-native species could be introduced and become established in newly developed areas and spread into Thompkins' sedge habitat. These indirect effects would have a long-term adverse impact on the species.

**Cumulative Effects.** The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Thompkins' sedge.

##### **Congdon's woolly-sunflower (*Eriophyllum congdonii*)**

**Direct and Indirect Effects.** Habitat for Congdon's woolly-sunflower occurs in Segment 4 (El Portal). There would be no direct effects on Congdon's woolly-sunflower as a result of the Preferred Alternative. Continued and increased use of the El Portal area could result in indirect adverse effects to this species as a result of increased population and associated foot traffic. Non-native species could be introduced and become established in newly developed areas and spread into Congdon's woolly-sunflower habitat. These indirect effects would have a long-term adverse impact on the species.

**Cumulative Effects.** The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under

Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Congdon's woolly sunflower.

#### **Congdon's lewisia (*Lewisia congdonii*)**

**Direct and Indirect Effects.** This species is known from the lower portion of the South Fork of the Merced River, El Portal, and through the lower portions of the Merced River gorge. Continued and increased use of the El Portal and Wawona areas could result in indirect adverse effects to this species through introduction and establishment of non-native species that could out-compete Congdon's lewisia, and through additional foot traffic that could result from an increased residential population. Most Congdon's lewisia plants are found in relatively inaccessible areas that have steep slopes and poison oak. These indirect effects would have a long-term adverse impact on the species.

**Cumulative Effects.** The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Congdon's lewisia.

### **California State Species of Special Concern**

#### ***Wildlife***

##### **Hardhead (*Mylopharodon conocephalus*)**

**Direct and Indirect Effects.** In the Sierra Nevada, hardhead is a native fish that inhabit the lower reaches of the Merced River up to the vicinity of El Portal. It requires undisturbed areas of larger middle- and low-elevation streams that support clear, deep pools with sand-gravel-boulder substrates and slow water velocities. Suitable habitat for the hardhead is found in Segments 4, 6, and 7 of the Merced River corridor (El Portal, South Fork Merced River Impoundment, and Wawona, respectively).

The Preferred Alternative in the *Merced River Plan/DEIS* does not propose any actions that would result in adverse or beneficial effects to the hardhead in Segment 6 (the Impoundment area).

Actions that would potentially result in adverse effects to the hardhead and its habitat include construction of new park facilities and infrastructure (e.g., parking lots and high density employee housing) in Segments 4 and 7. These actions would have a negligible adverse impact because of the limited area that would be involved, the existing human disturbance in the area, and construction outside of suitable habitat for the hardhead (i.e., the Merced River and adjacent riparian habitat within the 100-year floodplain). Additionally, the Preferred Alternative would also restore significant

amounts of riparian habitat in Segments 4 and 7. These restorative actions would have long-term beneficial effects on hardhead due to increased productivity of the river ecosystem and enhanced water quality of the Merced River.

**Cumulative Effects.** Projects that have an appreciable effect on montane riparian and riverine habitats are most likely to affect the hardhead. Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could increase the productivity of the Merced River, enhance river complexity, and maintain good water quality. These actions could have long-term beneficial effects on suitable habitat for the hardhead, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the hardhead include the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on hardhead.

#### **Northern goshawk (*Accipiter gentilis*)**

**Direct and Indirect Effects.** The northern goshawk breeds in most mountain areas, where they generally remain through the winter. Their preferred habitat is moderately dense coniferous forests broken by meadows and other openings, between 5,000 and 9,000 feet elevation. Segments 1 and 5 (Merced River above Nevada Fall and South Fork Merced River above Wawona, respectively) support this species.

The Preferred Alternative would restore meadows within Segments 1 and 5 and would result in negligible adverse effects to the northern goshawk during restoration. Meadow restoration, cessation of pack stock grazing, and re-routing trails outside of sensitive meadow habitat would result in long-term beneficial effects on the northern goshawk as foraging habitat within meadows would improve over time.

Proposed actions at the Merced Lake High Sierra Camp in Segment 1 would retain the camp, reduce capacity of beds, and replace flush toilets with composting toilets. These actions would result in a negligible beneficial impact on northern goshawk in Segment 1 by reducing stresses from visitor use.

**Cumulative Effects.** Projects that have an appreciable effect on high-elevation forest and meadow habitats are most likely to affect the northern goshawk. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit

Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable habitat for the northern goshawk. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the northern goshawk include those that affect forest and meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements. The 2009 Fire Management Plan and Fuels reductions/forest rehabilitation projects (U.S. Forest Service) could temporarily affect northern goshawks during plan implementation.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on northern goshawk.

#### **Long-eared owl (*Asio otus*)**

**Direct and Indirect Effects.** Given the rarity of observations in Yosemite Valley, and the age of the last confirmed nesting there, it is possible that increasing human disturbance has affected use of Valley habitats by long-eared owls, especially in meadow and riparian habitats. Long-eared owl habitat is largely intact in the park, except for localized habitat destruction from roads and development. Suitable habitat for the long-eared owl is found in most segments of the Merced River corridor (Segments 2, 3, 4, 6, 7, and 8) west of Nevada Fall and the impoundment area.

The proposed actions within segments 3, 6, and 8 under the Preferred Alternative primarily involve ecological restoration or maintaining current types of uses. Thus, impacts to the long-eared owl as a result of these actions would be long-term, local, and beneficial. Additionally, the Preferred Alternative would also restore montane riparian, wet meadow, oak woodland, and aquatic habitats in Segments 2, 4, and 7. These restorative actions would have long-term, beneficial effects on long-eared owls.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have adverse effects on potential long-eared owl habitat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, parking lots, and high density employee housing) in Segments 2, 4 and 7. Long-eared owl habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Curry Village, Camp 6 Yosemite Village, and Yosemite Lodge and Camp 4; and by removal of campsites that are within the 100-year floodplain or in culturally sensitive areas at the Wawona Campground in Segment 7. Construction activities in Segment 2 could indirectly affect long-eared owl due to disturbance associated with



removal, restoration, and construction of new facilities. Potential foraging habitat for long-eared owl in Segment 2 would be affected, including direct loss of ponderosa pine (34.04 acres), montane riparian (0.81 acres), and montane hardwood (1.73 acres) habitat. Tree removal associated with the construction of new facilities in Segment 2 would remove potential suitable roosts or perches for owls. However, the location of trees planned for removal are in proximity to existing developed sites, and thus would not likely serve as nest sites for long-eared owls. Heavy construction equipment and an increase in human presence in Segments 2 and 7 would temporarily cause long-eared owls to relocate or avoid the area for foraging. Pre-construction surveys for long-eared owl nests would be conducted prior to the implementation of proposed actions in Segments 2 and 7 to ensure that no active owl nest sites could be affected. Additionally, older trees and snags would be retained in Segment 2 for long-eared owl habitat where possible. In summary, proposed actions related to managing visitor use and facilities in Segments 2, 4 and 7 would have adverse effects on long-eared owls as a result of construction-related disturbances to foraging habitat.

Overall, there would be a long-term beneficial impact on the long-eared owl as a result of a substantial amount of restored high-quality habitat in Yosemite Valley, El Portal, and Wawona areas.

**Cumulative Effects.** Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service) could provide benefits to the long-eared owl.

The Utilities Master Plan/East Yosemite Valley Utilities Improvement Plan and Parkwide Communication Data Network projects may have an adverse effect on long-eared owl habitat.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on long eared owl.

#### **Vaux's swift (*Chaetura vauxi*)**

**Direct and Indirect Effects.** Vaux's swift habitat occurs in forested areas near meadows within Yosemite Valley and Wawona (Segments 2 and 7, respectively). It inhabits redwood and Douglas-fir habitats and utilizes large hollow trees and snags, and prefers tall, burned-out stubs as nest sites. Vaux's swifts forage in a variety of habitats, especially over water, including riparian habitats. The Preferred Alternative would restore a variety of habitats, including those used by Vaux's swift such as montane riparian and coniferous forest, in Segments 2 and 7. These restorative actions would have long-term, beneficial effects on Vaux's swift.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have adverse effects on potential Vaux's swift habitat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) in Segment 2

(Yosemite Valley). Vaux's swift habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Camp 6 Yosemite Village, including construction and restoration activities associated with formalizing parking lots, moving parking lots away from riparian areas, construction of new parking spaces, and construction of a pedestrian underpass and a roundabout. Indirect effects to Vaux's swift would result from disturbance associated with construction activities. Potential foraging habitat for Vaux's swift would be affected, including direct loss of montane riparian habitat (0.81 acres). Habitat and tree removal associated with the construction of new facilities would remove potential suitable perches for swifts. However, the location of trees planned for removal is typically located in proximity to existing developed sites that receive relatively high levels of human disturbance. Heavy construction equipment and an increase in human presence would temporarily cause Vaux's swifts to relocate or avoid the area for foraging. Pre-construction surveys for Vaux's swift nests would be conducted prior to the implementation of proposed actions in Segment 2 to ensure that no active nest sites could be affected. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have long-term, adverse effects on Vaux's swifts as a result of construction-related disturbances to foraging habitat. Overall, there would be a long-term beneficial impact on the Vaux's swift as a result of a substantial amount of restored high-quality habitat in Yosemite Valley and Wawona.

**Cumulative Effects.** Projects that have an appreciable effect on mid-elevation forest and meadow habitats are most likely to affect the Vaux's swift. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging habitat for the Vaux's swift. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the Vaux's swift include those that affect forest, meadow, and aquatic habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements. The 2009 Fire Management Plan and Fuels reductions/forest rehabilitation projects (U.S. Forest Service) may affect Vaux's swift during plan implementation.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Vaux's swift.

#### **Northern harrier (*Circus cyaneus*)**

**Direct and Indirect Effects.** Northern harrier habitat occurs in open grassland, meadows, and wetlands within segments 2 and 7 (Yosemite Valley and Wawona, respectively). The Preferred

Alternative would restore large areas of habitat suitable for northern harrier, including wet meadows in Yosemite Valley and Wawona. These restorative actions would have beneficial effects on northern harrier as foraging and nesting habitat for this species would improve (in size, integrity, and continuity) over time.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have adverse effects on potential northern harrier habitat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) in Segments 2 and 7 (Yosemite Valley and Wawona, respectively). The proposed actions in Segment 2 and 7 would not occur in suitable nesting habitat for northern harrier. However, construction-related noise and human presence may cause northern harriers to temporarily avoid certain areas for foraging, causing negligible adverse impacts on this species.

Overall, there would be a long-term beneficial impact on the northern harrier as a result of a substantial amount of restored high-quality habitat in Yosemite Valley and Wawona.

**Cumulative Effects.** Projects that have an appreciable effect on meadow and grassland habitats are most likely to affect the northern harrier. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging habitat for the northern harrier. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the northern harrier include those that affect meadows, wetlands, and grassland habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on northern harrier.

#### **Olive-sided flycatcher (*Contopus cooperi*)**

**Direct and Indirect Effects.** Olive-sided flycatcher habitat occurs in forest and woodland habitats below 9,000 feet. It prefers mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine habitats for nesting. Olive-sided flycatchers prefer unobstructed airspace within openings and over forest canopies with exposed perches for foraging. Suitable habitat for this species occurs in Segments 1, 2, 5, and 7 (Merced River above Nevada Fall, Yosemite Valley, South Fork Merced River above Wawona, and Wawona, respectively).

The proposed actions in Segments 1 and 5 are primarily ecological restoration actions in meadows and wetlands that would result in negligible adverse effects to the olive-sided flycatcher during construction as these restoration activities occur outside of preferred flycatcher nesting habitat. Meadow and wetland restoration, cessation of pack stock grazing, and re-routing trails outside of sensitive meadow habitat would result in long-term beneficial impacts to foraging habitat for the olive-sided flycatcher.

The Preferred Alternative would restore large areas of suitable foraging habitat for the olive-sided flycatcher in Segments 2 (Yosemite Valley) and 7 (Wawona), including meadows within forest openings. These restorative actions would have beneficial effects on olive-sided flycatcher as foraging habitat for this species would improve (in size, integrity, and continuity) over time.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have adverse effects on potential olive-sided flycatcher habitat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) in Segments 2 and 7 (Yosemite Valley and Wawona, respectively). Olive-sided flycatcher foraging habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Yosemite Village Day-use Parking Area, including construction and restoration activities associated with formalizing parking lots, moving parking lots away from riparian areas, construction of new parking spaces, and construction of a pedestrian underpass and a roundabout. Indirect effects to olive-sided flycatcher would result from disturbance associated with construction activities. Potential foraging habitat for olive-sided flycatcher would be affected, including direct loss of montane riparian habitat (0.81 acres). Habitat and tree removal associated with the construction of new facilities would remove potential suitable perches for flycatchers. However, the location of trees planned for removal is typically located in proximity to existing developed sites that receive relatively high levels of human disturbance. Heavy construction equipment and an increase in human presence would temporarily cause olive-sided flycatchers to relocate or avoid the area for foraging. Pre-construction surveys for olive-sided flycatcher nests would be conducted prior to the implementation of proposed actions in Segment 2 to ensure that no active nest sites could be affected. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have adverse effects on olive-sided flycatcher as a result of construction-related disturbances to foraging habitat.

Overall, the Preferred Alternative would result in long-term beneficial effects on olive-sided flycatcher as a result of a substantial amount of restored high-quality habitat in Yosemite Valley and Wawona.

**Cumulative Effects.** Projects that have an appreciable effect on forest, woodland, and meadow habitats are most likely to affect the olive-sided flycatcher. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging habitat for the olive-sided flycatcher. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the olive-sided flycatcher include those that affect forest, woodland, and open meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on olive-sided flycatcher.

### **Black swift (*Cypseloides niger*)**

**Direct and Indirect Effects.** Black swift nest sites are located in moist crevices, caves or on cliffs behind or adjacent to waterfalls in deep canyons. The Preferred Alternative would not result in direct or indirect adverse effects on nesting habitat for the black swift. It forages in various habitats. Suitable foraging habitat for this species occurs in Segment 2 (Yosemite Valley).

The Preferred Alternative would restore large areas of suitable foraging habitat for the black swift in Segment 2 (Yosemite Valley), including meadows and riparian habitats. These restorative actions would have beneficial effects on black swift as foraging habitat for this species improves over time (in size, integrity, and continuity).

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects on foraging habitat for black swift include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) in Yosemite Valley. These actions would have a negligible adverse impact because of the limited area that would be involved, the existing human disturbance in the area, and the large area of suitable, unaffected habitat that would continue to exist in surrounding areas. Additionally, all actions occur outside of black swift preferred nesting habitat (behind waterfalls).

Overall, the Preferred Alternative would result in long-term beneficial effects on black swift as a result of a substantial amount of restored high-quality habitat in Yosemite Valley.

**Cumulative Effects.** Projects that have an appreciable effect to meadow, wetlands, and riparian habitats are most likely to affect the black swift as they forage in a variety of habitats. However, most actions would not affect black swift nesting habitat due to their specialized requirements. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging habitat for the black swift. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the black swift include those that affect meadow, wetlands, and riparian/woodland habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on black swift.

#### **Yellow warbler (*Setophaga petechia*)**

**Direct and Indirect Effects.** The yellow warbler prefers riparian woodlands, but also breeds in chaparral, ponderosa pine, and mixed conifer habitats with substantial amounts of brush. Suitable habitat for the yellow warbler occurs in all segments (Segments 1-8) within the Merced River corridor.

The Preferred Alternative would restore large tracts of previously disturbed meadow, riparian, coniferous and broadleaf forest, and Valley oak woodland habitats, primarily in Yosemite Valley, El Portal, and Wawona, totaling approximately 203 acres of habitat. Removal of campgrounds and park facilities located within 100 feet of the river and restoring these areas would increase the amount, integrity, and contiguity of habitat for this species. This would improve suitable habitat for the yellow warbler. These restorative actions would have beneficial effects on yellow warbler as foraging habitat for this species improves over time (in size, integrity, and continuity).

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects to yellow warbler include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, employee housing, and parking lots) in Yosemite Valley, El Portal, and Wawona.

Yellow warbler habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Yosemite Village Day-use Parking Area, including construction and restoration activities associated with formalizing parking lots, moving parking lots away from riparian areas, construction of new parking spaces, and construction of a pedestrian underpass and a roundabout. Indirect effects to yellow warbler would result from disturbance associated with construction activities. Potential foraging habitat for yellow warbler would be affected, including direct loss of montane riparian habitat (0.81 acres). Habitat and tree removal associated with the construction of new facilities would remove potential suitable perches for warblers. However, the location of trees planned for removal is typically located in proximity to existing developed sites that receive relatively high levels of human disturbance. Heavy construction equipment and an increase in human presence would temporarily cause yellow warblers to relocate or avoid the area for foraging. Pre-construction surveys for yellow warbler nests would be conducted prior to the implementation of proposed actions in Segment 2 to ensure that no active nest sites could be affected. In summary, proposed actions related to managing

visitor use and facilities in Segment 2 would have adverse effects on yellow warbler as a result of construction-related disturbances to foraging habitat.

The overall, long-term effect on yellow warblers under the Preferred Alternative in the *Merced River Plan/DEIS* would be beneficial, primarily due to the restoration of highly suitable riparian habitat and the prohibition of new development within the 100-year floodplain of the Merced River.

**Cumulative Effects.** Projects that substantially affect riparian woodland, chaparral, ponderosa pine, and mixed conifer habitats would likely affect the yellow warbler. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging and nesting habitat for the yellow warbler. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the yellow warbler include those that affect riparian/woodland and forest habitats, such as the Parkwide Communication Data Network and Tioga Road Rehabilitation Project.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on yellow warbler.

#### **Harlequin duck (*Histrionicus histrionicus*)**

**Direct and Indirect Effects.** Harlequin ducks are very rarely seen in Yosemite, possibly due to human disturbance in riparian areas that provide cover for nest sites and broods. Nests are established near swift rivers or streams in recesses sheltered overhead by stream banks, rocks, woody debris, or low shrubs. Nests are usually within 7 feet of the water, but can be up to 90 feet away. Although they are rare within Yosemite, potential suitable habitat for the harlequin duck occurs in all segments (Segments 1-8) within the Merced River corridor.

The Preferred Alternative would restore large tracts of previously disturbed meadow, riparian, coniferous and broadleaf forest, and Valley oak woodland habitats, primarily in Yosemite Valley, El Portal, and Wawona, totaling approximately 203 acres of habitat. Restoration of riparian habitat would improve and increase the amount of suitable habitat for the harlequin duck. Removal of campgrounds and park facilities located within 100 feet of the river and restoring these areas would increase the amount, integrity, and contiguity of habitat for this species. These restorative actions would have beneficial effects on the harlequin duck as nesting and foraging habitat for this species improves over time (in size, integrity, and continuity).

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects to the harlequin duck include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, employee housing, and parking lots) in Yosemite Valley, El Portal, and Wawona. These actions would have a negligible adverse impact because of the limited area that would be involved, the existing human disturbance in the area, and the large area of suitable, unaffected habitat that would continue to exist in surrounding areas. Additionally, proposed new campgrounds and park facilities would be constructed outside of the 100-year floodplain to further avoid impacts to intact riparian habitat.

The overall, long-term effect on the harlequin duck under the Preferred Alternative in the *Merced River Plan/DEIS* would be beneficial, primarily due to the restoration of highly suitable riparian habitat and the prohibition of new development within the 100-year floodplain of the Merced River.

**Cumulative Effects.** Foreseeable projects that could have beneficial effects on the harlequin duck and its habitat include regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan. These actions could have long-term, beneficial effects on suitable habitat for harlequin duck, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the harlequin duck include those that affect riparian woodland habitat, such as the Parkwide Communication Data Network and Tioga Road Rehabilitation Projects.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on harlequin duck.

#### **California spotted owl (*Strix occidentalis occidentalis*)**

**Direct and Indirect Effects.** California spotted owl occurs in oak and ponderosa pine forests to lower elevation red fir forests up to 7,600 feet in elevation; preferred elevation is ranges between 3,000 and 7,000 feet. Tree cavities, broken-off trees and snags, abandoned nests of other species, or mistletoe clumps are used as nesting sites. California spotted owl requires dense forest, with a canopy closure of greater than 70%. The presence of black oak in the canopy also enhances habitat quality. In the Merced River corridor, suitable spotted owl habitat occurs in mature and old forests with dense canopies in segments 1, 2, 5, and 7 (Merced River above Nevada Fall, Yosemite Valley, South Fork Merced River above Wawona, and Wawona, respectively).



The Preferred Alternative in the *Merced River Plan/DEIS* would restore meadows within Segments 1 and 5, which would result in no effects to the spotted owl as these activities are not conducted within preferred spotted owl habitat. The Preferred Alternative would restore large areas of habitat in Segments 2 (Yosemite Valley) and 7 (Wawona). These restorative actions would have beneficial effects on the spotted owl by potentially increasing the quality and extent of suitable foraging habitat.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that may result in adverse effects to spotted owl habitat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) in forest habitats within Segments 2 and 7 (Yosemite Valley and Wawona). California spotted owl habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Construction and reorganization activities at these locations could indirectly affect long-eared owl due to disturbance associated with construction activities. Potential habitat for spotted owl would be affected, including direct loss of ponderosa pine (34.04 acres) and montane hardwood (1.73 acres) habitat. Tree removal associated with the construction of new facilities would remove potential suitable roosts or perches for owls. However, the location of trees planned for removal are in proximity to existing developed sites that receive relatively high levels of human disturbance, and thus would not likely serve as nest sites for spotted owls. Heavy construction equipment and an increase in human presence would temporarily cause spotted owls to relocate or avoid the area for foraging. Pre-construction surveys for spotted owl nests would be conducted prior to the implementation of proposed actions in Segment 2 to ensure that no active owl nest sites could be affected. Additionally, older trees and snags would be retained for spotted owl habitat where possible. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have long-term, adverse effects on spotted owls as a result of construction-related disturbances to foraging and nesting habitat.

Overall, the Preferred Alternative would result in long-term beneficial effects to California spotted owl and their habitat as a result of a substantial amount of restored high-quality habitat in Yosemite Valley and Wawona.

**Cumulative Effects.** Projects that have an appreciable effect on intermediate to late successional forests with dense canopy closure are most likely to affect the California spotted owl. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), and Tuolumne Wild and Scenic River Comprehensive Management Plan, could improve the size, integrity, and connectivity of suitable foraging and nesting habitat for the spotted owl. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the California spotted owl include those that affect forest habitats, such as the Parkwide Communication Data Network and Tioga Road Rehabilitation Projects. The 2009 Fire Management Plan and Fuels reductions/forest rehabilitation projects (U.S. Forest Service) may affect spotted owls during plan implementation.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on California spotted owl.

#### **Pallid bat (*Antrozous pallidus*)**

**Direct and Indirect Effects.** Pallid bats occurs in a variety of habitats including oak woodlands, coniferous forests, riparian woodland, and meadows. This species is quite versatile in its choice of roosting sites and has been documented using tree hollows, rock crevices, caves, abandoned mines, and structures. Suitable habitat for this species occurs in all segments (Segments 1-8) within the Merced River corridor.

The Preferred Alternative would restore approximately 203 acres of previously disturbed meadow, riparian, wetland, coniferous and broadleaf forest, and Valley oak woodland habitat, primarily in Segments 2, 4, and 7. Minor restoration actions would also occur in Segments 1 and 5. These restorative actions would have long-term, beneficial effects on the pallid bat by improving foraging habitat for this species.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects to the pallid bat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, employee housing, and parking lots) in Yosemite Valley, El Portal, and Wawona. Pallid bat habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Construction and reorganization activities at these locations could indirectly affect pallid bat due to disturbance associated with construction activities. Potential foraging and roosting habitat for pallid bat would be affected, including direct loss of ponderosa pine (34.04 acres), montane hardwood (1.73 acres), montane riparian (0.81 acres), and wet meadow (0.31 acres) habitat. Removal of mature trees with cavities or structures associated with the construction of new facilities would remove potential suitable roosting habitat for pallid bats. Heavy construction equipment and an increase in human presence would temporarily cause pallid bats to relocate or avoid the area for foraging. Pre-construction surveys for pallid bat roosting colonies would be conducted prior to the implementation of proposed actions in Segment 2 to ensure that no colony sites could be affected. Additionally, older trees and snags would be retained for pallid bat habitat where possible. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have adverse effects on pallid bats as a result of construction-related disturbances to foraging and roosting habitat.

Overall, the Preferred Alternative would result in long-term beneficial impacts on the pallid bat from actions to restore large areas of potential bat foraging habitat in Segments 2, 4, and 7, and to protect bat roosting habitat (trees) within the Merced River floodplain by restricting new development.

**Cumulative Effects.** Projects that substantially affect riparian woodland, ponderosa pine, and mixed conifer habitats would likely affect the pallid bat. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging and roosting habitat for the pallid bat. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the pallid bat include those that affect riparian/woodland and forest habitats, such as the Parkwide Communication Data Network and Tioga Road Rehabilitation Project.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on pallid bat.

#### **Sierra Nevada mountain beaver (*Aplodontia rufa californica*)**

**Direct and Indirect Effects.** Mountain beavers occur in moist meadows and riparian zones near small perennial streams and creeks within the montane zone and require abundant riparian plants for harvesting. Potential suitable habitat for this species occurs in segments 1 and 5 (Merced River above Nevada Fall and South Fork Merced River above Wawona). Proposed actions in Segments 1 and 5 are primarily ecological restoration actions, and thus would have negligible, direct and indirect effects on Sierra Nevada red fox during construction and beneficial effect following restoration.

**Cumulative Effects.** Projects that substantially affect high elevation riparian woodland and meadow habitats would likely affect the mountain beaver. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging and breeding habitat for the mountain beaver. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the mountain beaver include those that affect riparian/woodland and wet meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements Projects.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Sierra Nevada mountain beaver.

#### **Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)**

**Direct and Indirect Effects.** Previous mist-net surveys indicate that the Townsend's big-eared bat occurred in several locations within and adjacent to the Merced River corridor, namely in Yosemite Valley (Mirror Lake), Wawona (near the South Fork of the Merced River), and El Portal (in a barium mine on U.S. Forest Service land). It requires caves, mines, or buildings for roosting and mesic habitats with brush or trees along habitat edges for foraging. Potential suitable habitat for this species occurs in Segments 2, 3, 4, 7, and 8.

The Preferred Alternative would restore approximately 203 acres of previously disturbed meadow, riparian, wetland, coniferous and broadleaf forest, and Valley oak woodland habitats, primarily within Segments 2, 4, and 7. These restorative actions would have long-term, beneficial effects on Townsend's big-eared bat by improving foraging habitat for this species. The proposed actions within segments 3 and 8 under the Preferred Alternative primarily involve ecological restoration or maintaining current types of uses. Thus, impacts to the Townsend's big-eared bat as a result of these actions would be negligible, long-term, local, and beneficial.

Under the Preferred Alternative, actions that would potentially result in adverse effects to the Townsend's big-eared bat and its habitat include removal of select park facilities and construction of new park facilities and infrastructure (e.g., roundabouts, pedestrian under-crossing, parking lots and high density employee housing) in Segments 2, 4 and 7. Townsend's big-eared bat habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Construction and reorganization activities at these locations could indirectly affect Townsend's big-eared bat due to disturbance associated with construction activities (removal, restoration, and construction of new facilities). Potential foraging and roosting habitat for Townsend's big-eared bat would be affected, including direct loss of ponderosa pine (34.04 acres), montane hardwood (1.73 acres), montane riparian (0.81 acres), and wet meadow (0.31 acres) habitat. Removal of mature trees with cavities or structures associated with the construction of new facilities would remove potential suitable roosting habitat for Townsend's big-eared bats. Heavy construction equipment and an increase in human presence would temporarily cause bats to relocate or avoid the area for foraging. Pre-construction surveys for Townsend's big-eared bat roosting colonies would be conducted prior to the implementation of proposed actions in Segment 2 to ensure that no colony sites could be affected. Additionally, older trees and snags would be retained for Townsend's big-eared bat habitat where possible. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have adverse effects on Townsend's big-eared bats as a result of construction-related disturbances to foraging and roosting habitat.

Overall, the Preferred Alternative would result in long-term beneficial impacts on Townsend's big-eared bat from actions to restore large areas of potential bat foraging habitat in Segments 2, 4, and 7, and to protect bat roosting habitat (trees) within the Merced River floodplain by restricting new development.

**Cumulative Effects.** Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service) could provide benefits to the Townsend's big-eared bat.

Foreseeable projects that could have adverse effects on suitable habitat for Townsend's big-eared bats include the Utilities Master Plan/East Yosemite Valley Utilities Improvement Plan and Parkwide Communication Data Network Project.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Townsend's big-eared bat.

#### **Spotted Bat (*Euderma maculatum*)**

**Direct and Indirect Effects.** There is a significant population of spotted bats in Yosemite Valley that uses meadow and wetland habitats exclusively (as indicated by acoustic data/auditory surveys). It is also present in Wawona. Preferred roosting habitat include high cliff faces, likely on Half Dome and El Capitan. Foraging habitat is primarily meadows and forest edges, or in open coniferous woodland. Suitable habitat for this species occurs in segments 1, 2, 5, and 7 (Merced River above Nevada Fall, Yosemite Valley, South Fork Merced River above Wawona, and Wawona, respectively).

The Preferred Alternative would restore significant amounts of meadow, wetland, coniferous and broadleaf forest, and riparian habitats in Segments 1, 2, 5 and 7. These restorative actions would have long-term, beneficial effects on the spotted bat by improving foraging habitat and enhancing habitat complexity for this species.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects to the spotted bat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) primarily in Yosemite Valley and retaining certain services in Wawona. Spotted bat habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Construction and reorganization activities at these locations could indirectly affect spotted bat due to disturbance associated with construction activities. Potential foraging habitat for spotted bat would be affected, including direct loss of ponderosa pine (34.04 acres), montane riparian (1.73 acres), and wet meadow (0.31 acres) habitat.

Roosting habitat (cliffs and caves) for spotted bat would not be impacted. Heavy construction equipment and an increase in human presence would temporarily cause bats to avoid the area for foraging. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have adverse effects on spotted bats as a result of construction-related disturbances to foraging and roosting habitat.

Overall, the Preferred Alternative would result in long-term beneficial impacts on the spotted bat from actions to restore large areas of potential bat foraging habitat in Segments 1, 2, 5, and 7, and to protect bat roosting habitat (trees) within the Merced River floodplain by restricting new development.

**Cumulative Effects.** Projects that substantially affect coniferous woodland and meadow habitats would likely affect the spotted bat. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging habitat for the spotted bat. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the spotted bat include those that affect coniferous woodland and wet meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements Projects.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on spotted bat.

#### **Western mastiff bat (*Eumops perotis*)**

**Direct and Indirect Effects.** There is a significant population of western mastiff bats in Yosemite Valley, representing the highest population of the western mastiff bat in any localities surveyed in California. It is also present in Wawona. It roosts in rocky cliffs and canyons and forages in a variety of habitats, primarily meadows and coniferous forests. Suitable foraging habitat for the greater western mastiff bat occurs in Segments 1, 2, 5, and 7.

The Preferred Alternative would restore significant amounts of meadow, wetland, coniferous and broadleaf forest, and riparian habitats in Segments 1, 2, 5 and 7. These restorative actions would have long-term, beneficial effects to the western mastiff bat by improving foraging habitat and enhancing habitat complexity for this species.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects to the western mastiff bat include construction of new park facilities and infrastructure

(e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) primarily in Yosemite Valley and retaining certain services in Wawona. Western mastiff bat habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Construction and reorganization activities at these locations could indirectly affect western mastiff bat due to disturbance associated with construction activities. Potential foraging and roosting habitat for western mastiff bat would be affected, including direct loss of ponderosa pine (34.04 acres) and montane hardwood (1.73 acres) habitat. Roosting habitat (rock features) for western mastiff bat would not be impacted. Heavy construction equipment and an increase in human presence would temporarily cause bats to avoid areas for foraging. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have adverse effects on western mastiff bats as a result of construction-related disturbances to foraging habitat.

Overall, the Preferred Alternative would result in long-term beneficial impacts on the western mastiff bat from actions to restore large areas of potential bat foraging habitat in Segments 1, 2, 5, and 7.

**Cumulative Effects.** Projects that substantially affect coniferous woodland and meadow habitats would likely affect the greater western mastiff bat. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging habitat for the greater western mastiff bat. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the greater western mastiff bat include those that affect coniferous woodland and wet meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements Projects.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on western mastiff bat.

#### **Western Red Bat (*Lasiurus blossevillei*)**

**Direct and Indirect Effects.** Western red bats are strongly associated with riparian habitats, but they also occur over a wide variety of habitats including grasslands, shrublands, open woodlands and forests. They roost in trees and less often in shrubs often located in edge habitats adjacent to streams, fields, or urban areas. Potential suitable habitat for the western red bat occurs in all segments of the

Merced River corridor, in trees, hedgerows, and forest edges. However, their occurrence is rare within the Sierra Nevada because the majority of western red bats are concentrated at lower elevations.

The Preferred Alternative would restore approximately 203 acres of previously disturbed meadow, riparian, wetland, coniferous and broadleaf forest, and Valley oak woodland habitat, primarily in Segments 2, 4, and 7. Minor restoration actions would also occur in Segments 1 and 5. This would improve suitable habitat for the western red bat. Removal of campgrounds and park facilities located within 100 feet of the river and restoring these areas would increase the amount, integrity, and contiguity of habitat for the western red bat. These restorative actions would have long-term, beneficial effects on western red bat as foraging habitat for this species improves over time (in size, integrity, and continuity).

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects to western red bat include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, employee housing, and parking lots) in Yosemite Valley, El Portal, and Wawona. Western red bat habitat would be affected by proposed actions to manage visitor use and facilities in Segment 2 at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. Construction and reorganization activities at these locations could indirectly affect western red bat due to disturbance associated with construction activities. Potential foraging and roosting habitat for western red bat would be affected, including direct loss of ponderosa pine (34.04 acres) and montane riparian (0.81 acres) habitat. Removal of mature trees with cavities associated with the construction of new facilities would remove potential suitable roosting habitat for western red bats. Heavy construction equipment and an increase in human presence would temporarily cause western red bats to relocate or avoid the area for foraging. Pre-construction surveys for Western red bat active roosting sites would be conducted prior to the implementation of proposed actions in Segment 2 to ensure that no active roosting sites could be affected. Additionally, older trees and snags would be retained for western red bat habitat where possible. In summary, proposed actions related to managing visitor use and facilities in Segment 2 would have adverse effects on western red bats as a result of construction-related disturbances to foraging and roosting habitat.

Overall, the Preferred Alternative would result in long-term beneficial impacts on the western red bat from actions to restore large areas of potential bat foraging habitat, primarily in Segments 2, 4, and 7, and to protect bat roosting habitat (trees) within the Merced River floodplain by restricting new development. **Cumulative Effects.** Projects that substantially affect riparian woodland habitat would likely affect the western red bat. Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging and roosting habitat for the western red bat. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.



Projects that could have a potentially adverse effect on the western red bat include those that affect riparian/woodland and forest habitats, such as the Parkwide Communication Data Network and Tioga Road Rehabilitation Project.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on western red bat.

#### **Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*)**

**Direct and Indirect Effects.** Sierra Nevada snowshoe hares are relatively scarce in Yosemite, since this area is apparently at the southern extreme of their range. It occurs in boreal riparian habitats, within thickets of deciduous trees in riparian and conifer forests. Segments 1 and 5 (Merced River above Nevada Fall and South Fork Merced River, respectively) provide suitable habitat for the Sierra Nevada snowshoe hare at high elevations.

The Preferred Alternative would restore meadows and wetlands within Segments 1 and 5, which would result in no adverse or beneficial effects to the Sierra Nevada snowshoe hare as these activities are conducted outside of the preferred foraging and breeding habitat. However, meadow habitats are ecologically linked to adjacent habitats, such as riparian woodland, a suitable habitat for the snowshoe hare. Restoration activities to enhance meadow habitat and improve habitat connectivity would enhance foraging habitat for the snowshoe hare and other wildlife in general.

Overall, effect of the Preferred Alternative on Sierra Nevada snowshoe hare is expected to be negligible, long-term, local and beneficial.

**Cumulative Effects.** Projects that have an appreciable effect on high-elevation riparian woodland and coniferous forests are most likely to affect the Sierra Nevada snowshoe hare. Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable habitat for the snowshoe hare. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the snowshoe hare include those that affect riparian and coniferous forest habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably

foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Sierra Nevada snowshoe hare.

#### **Western white-tailed jackrabbit (*Lepus townsendii townsendii*)**

**Direct and Indirect Effects.** Although habitats for the western white-tailed jackrabbit are relatively intact in Yosemite, reported observations of white-tailed jackrabbits are rare. Important foraging habitat for this species includes open alpine and mountain meadows, and open stands of trees with some brush and an herbaceous understory. Segments 1 and 5 (Merced River above Nevada Fall and South Fork Merced River above Wawona) likely provide suitable habitat for the western white-tailed jackrabbit.

The Preferred Alternative would restore meadows and wetlands within Segments 1 and 5 and would result in negligible adverse effects to the white-tailed jackrabbit during restoration. Overgrazing by livestock has been identified as a principal factor in the decline of jackrabbits. Meadow restoration, cessation of pack stock grazing, and re-routing trails outside of sensitive meadow habitat would result in long-term beneficial impacts to the jackrabbit as foraging habitat within meadows would improve over time.

**Cumulative Effects.** Projects that have an appreciable effect on mid-elevation forest and meadow habitats are most likely to affect the white-tailed jackrabbit. Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging habitat for the jackrabbit. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the jackrabbit include those that affect forest and meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on western white-tailed jackrabbit.

**Mount Lyell shrew (*Sorex lyellii*)**

**Direct and Indirect Effects.** The Mount Lyell shrew occurs in wetland and riparian communities and moist habitats near streams, in grass, or under willows. Its limited distribution makes it vulnerable to extirpation. Suitable habitat occurs in wetland communities within segments 1 and 5 (Merced River above Nevada Fall and South Fork Merced River above Wawona, respectively).

The Preferred Alternative would restore meadows and wetlands within Segments 1 and 5 and would result in negligible adverse effects to the Mount Lyell shrew during restoration. However, meadow restoration, cessation of pack stock grazing, and re-routing trails outside of sensitive meadow habitat would result in long-term beneficial impacts to the Mount Lyell shrew as foraging habitat within meadows and wetlands would improve over time.

**Cumulative Effects.** Projects that have an appreciable effect on high-elevation riparian and meadow habitats are most likely to affect the Mount Lyell shrew. Regional and park-wide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable habitat for the shrew. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the Mount Lyell shrew include those that affect riparian, wetland, and meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Mount Lyell shrew.

**American Badger (*Taxidea taxus*)**

**Direct and Indirect Effects.** The American badger occurs in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Suitable habitat for the badger occurs in Wawona (Segment 7).

The Preferred Alternative would restore approximately two acres of riparian habitat in Segment 7. These restorative actions would have long-term, beneficial effects on the badger by improving foraging habitat for this species.

**Cumulative Effects.** Projects that have significant effects on shrub, forest, and other herbaceous habitats are most likely to affect the American badger. Regional and park-wide planning efforts such

as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable habitat for the American badger. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the American badger include those that affect forest and shrub habitats, such as the Park-wide Communication Data Network, Tioga Road Rehabilitation, and 2009 Fire Management Plan and Fuels reductions/forest rehabilitation projects (U.S. Forest Service).

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on American badger.

#### **Western pond turtle (*Emys marmorata*)**

**Direct and Indirect Effects.** The western pond turtle requires permanent ponds, rivers, streams, and irrigation ditches that typically have rocky or muddy bottoms and are overgrown with vegetation. Basking areas are required by this species and include partially submerged logs, rocks, mats of vegetation, or open mud banks. Park records show sightings of the western pond turtle in Yosemite Valley and El Portal. Suitable habitat for this species occurs in Yosemite Valley, El Portal, and Wawona (Segments 2, 4, and 7, respectively). However, this species is believed to be extirpated from the Merced River corridor in Yosemite National Park.

Overall, the Preferred Alternative in the *Merced River Plan/DEIS* would have a beneficial impact to the western pond turtle from actions to restore large areas of meadow and riparian habitats in Segments 2, 4, and 7, and to further protect riparian and meadow habitat within the Merced River floodplain by restricting new development. These habitats form direct ecological linkages to suitable western turtle habitat (ponds, rivers, streams, and ditches); thus, actions to restore meadow and riparian habitats would result in beneficial, long-term effects to the western pond turtle.

**Cumulative Effects.** Projects that substantially affect riparian woodland, meadow, and other aquatic habitats would likely affect the western pond turtle. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the integrity and connectivity of suitable foraging and basking habitat for the western pond turtle. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the western pond turtle include those that affect riparian, wet meadow, and aquatic habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements Projects.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on western pond-turtle.

#### **Mount Lyell salamander (*Hydromantes platycephalus*)**

**Direct and Indirect Effects.** Mount Lyell salamander occurs in wet habitats above 4,000 feet. It requires rock fissures or similar crevices for shelter, seeps from streams or melting snow, shade, and low-growing vegetation. Records indicate this species occur in Yosemite Valley in the vicinity of Vernal Fall and Curry Village, at the top of Vernal Fall, near the top of Half Dome, and various parts of Lyell Canyon. Suitable habitat for the Mount Lyell salamander occurs in Segments 1, 2, and 5.

The Preferred Alternative would restore significant amounts of meadow, wetland, and riparian habitats throughout Yosemite Valley. Minor meadow and wetland restoration actions would also occur in Segments 1 and 5. These restorative actions may result in negligible, direct and indirect effects on the Mount Lyell salamander during restoration; however, in the long-term, these actions would result in beneficial effects to the salamander by improving foraging and breeding habitat for this species.

Under the Preferred Alternative in the *Merced River Plan/DEIS*, actions that would have potential adverse effects to the Mount Lyell salamander include construction of new park facilities and infrastructure (e.g., campgrounds, roundabouts, pedestrian under-crossing, and parking lots) in Yosemite Valley. These actions would have negligible adverse impacts because of the limited amount of habitat impacted, the existing human disturbance in the area, and the large area of suitable, unaffected habitat that would continue to exist in surrounding areas. Additionally, proposed new campgrounds and park facilities would be constructed outside wetlands, meadows, and riparian woodland habitat.

Overall, the Preferred Alternative in the *Merced River Plan/DEIS* would have a beneficial impact to the Mount Lyell salamander from actions to restore large areas of suitable foraging and breeding habitat, and to further protect meadow, wetland, and riparian habitats within the Merced River floodplain by restricting new development.

**Cumulative Effects.** Projects that substantially affect rocky slopes, seeps adjacent to streams, meadow and wetland habitats would likely affect the Mount Lyell salamander. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, 2009 Fire

Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging and breeding habitat for the salamander. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the Mount Lyell salamander include those that affect rocky areas, seeps, talus slopes, and granitic areas adjacent to streams and waterfalls such as the Parkwide Communication Data Network and Tioga Road Rehabilitation Projects. However, due to the specialized habitat needs of this species, most projects would likely not affect the species.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on Mount Lyell salamander.

#### **Foothill yellow-legged frog (*Rana boylei*)**

**Direct and Indirect Effects.** The few remaining populations of foothill yellow-legged frogs live in or near permanent freshwater rocky streams and rivers in a variety of habitats, including valley-foothill hardwood and conifer, chaparral, and wet meadow types. Recent surveys found no foothill yellow-legged frogs in Yosemite National Park (Fellers and Freel 1995; Fellers 1997). However, potential suitable habitat for this species occurs in Segments 2, 3, 4, 6, 7, and 8. This species is believed to be extirpated from the Merced River corridor in Yosemite National Park.

Overall, the Preferred Alternative in the *Merced River Plan/DEIS* would have a beneficial impact to the foothill yellow-legged frog from actions to restore large areas of suitable foraging and breeding habitat in Segments 2, 4, and 7, and to further protect riparian and meadow habitat within the Merced River floodplain by restricting new development.

**Cumulative Effects.** Projects that substantially affect riparian woodland and meadow habitats would likely affect the foothill yellow-legged frog. Regional and parkwide planning efforts such as the Vegetation Management Plan, General Ecological Restoration, Grazing Allotment Permit Renewals (U.S. Forest Service), 2009 Fire Management Plan, Invasive Plant Management Plan Update, Fuels reductions/forest rehabilitation projects (U.S. Forest Service), High Elevation Aquatic Resources Management Plan, Tuolumne Wild and Scenic River Comprehensive Management Plan, and Tuolumne Meadows Concept Plan could improve the size, integrity, and connectivity of suitable foraging and breeding habitat for the foothill yellow-legged frog. These actions could have long-term, beneficial effects on suitable habitat, depending upon the extent of their implementation over time.

Projects that could have a potentially adverse effect on the foothill yellow-legged frog include those that affect riparian/woodland and wet meadow habitats, such as the Parkwide Communication Data Network, Tioga Road Rehabilitation, and Tuolumne Meadows Water Treatment System Improvements Projects.

The actions under the Preferred Alternative would have long-term, beneficial effects on special-status species in the Merced River corridor. However, in relation to past, present, and reasonably foreseeable future actions throughout the Sierra Nevada and larger region, (e.g., introduction and spread of nonnative species, direct displacement of habitat) the actions under Alternative 5 would have a minimal beneficial effect. Overall, in conjunction with actions proposed in Alternative 5, cumulative actions on special status species would result in long-term, adverse effects on foothill yellow-legged frog.

## Park Rare Species

### *Plants*

#### Segment 1: Merced River Above Nevada Fall

There are ten park rare plant species that are potentially found in Segment 1: California bolandra (*Bolandra californica*), Mono Hot Springs evening primrose (*Camissonia sierrae* ssp. *alticola*), cleft sedge (*Carex fissuricola*), Yosemite sedge (*Carex sartwelliana*), Bolander's woodreed (*Cinna bolanderi*), common mare's tail (*Hippuris vulgaris*), redbay alpinegold (*Hulsea heterochroma*), western quillwort (*Isoetes occidentalis*), Coleman's piperia (*Piperia colemanii*), and Oregon saxifrage (*Saxifraga oregona*).

Special status plants may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with management actions proposed in the Preferred Alternative in Segment 1. Proposed actions in the near-term at the Merced Lake High Sierra Camp in Segment 1 would retain the Merced Lake High Sierra Camp, reduce the camp capacity, and replace flush toilets with composting toilets. Potential adverse impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. Adhering to proposed mitigation measures presented in Appendix I and avoiding the removal of vegetation, where possible, would minimize these short-term impacts. Overall, the Preferred Alternative would result in long-term, beneficial impacts on special status plants in Segment 1 by reducing stresses from visitor use.

#### Segment 2: Yosemite Valley

There are 26 park rare plant species that are potentially found in Yosemite Valley: Lemmon's wild ginger (*Asarum lemmonii*), threadleaf beakseed (*Bulbostylis capillaris*), Sierra suncup (*Camissonia sierrae* ssp. *sierrae*), Buxbaum's sedge (*Carex buxbaumii*), Yosemite sedge (*Carex sartwelliana*), short-bracted bird's beak (*Cordylanthus rigidus* ssp. *brevibracteatus*), stream orchid (*Epipactis gigantea*), purple fawnlily (*Erythronium purpurascens*), northern mannagrass (*Glyceria borealis*), redbay alpinegold (*Hulsea heterochroma*), Sierra laurel (*Leucothoe davisiae*), false pimpernel (*Lindera dubia*

var. *anagallidea*), tanoak (*Lithocarpus densiflorus* var. *echinoides*), small flowered monkeyflower (*Mimulus inconspicuus*), cutleaf monkeyflower (*Mimulus laciniatus*), yellowlip pansy monkeyflower (*Mimulus pulchellus*), California bog asphodel (*Narthecium californicum*), azure penstemon (*Penstemon azureus* ssp. *angustissimus*), Purdy's foothill penstemon (*Penstemon heterophyllus* var. *purdyi*), tansy leafed phacelia (*Phacelia tanacetifolia*), Torrey's popcornflower (*Plagiobothrys torreyi* var. *torreyi*), Nutall's pondweed (*Potamogeton epihydrus* ssp. *nuttallii*), wood saxifrage (*Saxifraga mertensiana*), Oregon saxifrage (*Saxifraga oregona*), small bur reed (*Sparganium natans*), and narrowpetal wakerobin (*Trillium angustipetalum*).

The Preferred Alternative would restore significant amounts of meadow, wetland, coniferous and broadleaf forest, and riparian habitats in Segment 2. Restoration of these habitats would have a beneficial impact on park rare plant species that occur in those communities. Special status plants may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with management actions proposed in the Preferred Alternative in Segment 2. Potential adverse impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. Adhering to proposed mitigation measures presented in Appendix I and avoiding the removal of vegetation, where possible, would minimize these short-term impacts. Proposed actions to manage visitor use and facilities in Segment 2 would occur at Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4. It is unlikely that any park rare plant species occur in these areas due to the high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. In addition, no park rare plants were found during rare plant surveys conducted in 2010 in the areas listed above. Therefore, it is unlikely that park rare plant species will be affected by actions to manage visitor use and facilities in the Curry Village, Yosemite Village, Housekeeping Camp, Yosemite Lodge, and Camp 4 areas.

Vegetation removed under the Preferred Alternative would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 2 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measures presented in Appendix I and avoiding the removal of vegetation, where possible, would minimize short-term impacts. Non-native plant species would continue to invade undeveloped areas in Yosemite Valley. New construction can promote non-native species because it creates conditions, such as disturbed soil, that are favored by many non-native plants. An increase in non-native plants could result in habitat loss and a competition for resources (i.e., light, water, and nutrients) for the rare plants in Segment 2.

Overall, the Preferred Alternative would result in long-term beneficial impacts on special status plants in Segment 2.

### **Segments 3 and 4: Merced Gorge and El Portal**

There are eight park rare plant species that are potentially found in the Merced Gorge and El Portal: Thompkins' sedge (*Carex tompkinsii*), narrowleaf collinsia (*Collinsia linearis*), mountain lady's slipper (*Cypripedium montanum*), tanoak (*Lithocarpus densiflorus* var. *echinoides*), northern bugleweed



(*Lycopus uniflorus*), small flowered monkeyflower (*Mimulus inconspicuus*), valley oak (*Quercus lobata*), and Sierra bladder nut (*Staphylea bolanderi*).

The Preferred Alternative would restore nine acres of riparian and valley oak woodland habitats in Segment 4. Restoration of these habitats would have a beneficial impact on park rare plant species that occur in those communities. Special status plants may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with management actions proposed in the Preferred Alternative in Segment 4. Potential adverse impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. Adhering to proposed mitigation measures presented in Appendix I and avoiding the removal of vegetation, where possible, would minimize these short-term impacts.

Vegetation removed under the Preferred Alternative would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 4 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measures presented in Appendix I and avoiding the removal of vegetation, where possible, would minimize short-term impacts. There could be indirect effects on these species as a result of the increased human population in El Portal, which could promote additional foot traffic and possible trampling of these species. Non-native plant species would continue to invade undeveloped areas in El Portal. New construction can promote non-native species because it creates conditions, such as disturbed soil, that are favored by many non-native plants. An increase in non-native plants could result in habitat loss and a competition for resources (i.e., light, water, and nutrients) for the rare plants in El Portal. Currently, vehicles park under the dripline of the 38 valley oak trees that are designated as a biological ORV. This practice compacts soil under the trees and impacts root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity of these trees limits the area where oak seedlings can be recruited. Under the Preferred Alternative, oak protection areas would be designated in the Odgers' fuel transfer center as well as the adjacent parking lots. Parking within 10 feet of the base of oak trees and parking and new building construction within the oak protection area would be prohibited. Nonnative fill would be removed and soils decompacted. Appropriate native understory plant species would be planted. Overall, these actions would result in long-term beneficial impacts on valley oaks in Segments 4.

Overall, the Preferred Alternative would result in long-term beneficial impacts on special status plants in Segments 3 and 4.

### Segments 5-8: South Fork Merced River

There are 18 park rare plant species that are potentially found in the South Fork Merced River corridor: spurred snapdragon (*Antirrhinum leptaleum*), Lemmon's wild ginger (*Asarum lemmonii*), silvery sedge (*Carex canescens*), Yosemite sedge (*Carex sartwelliana*), Bolander's woodreed (*Cinna bolanderi*), narrowleaf collinsia (*Collinsia linearis*), mountain lady's slipper (*Cypripedium montanum*), California sunflower (*Helianthus californicus*), yellow and white monkeyflower (*Mimulus bicolor*), small flowered

monkeyflower (*Mimulus inconspicuus*), Sierra sweet-bay (*Myrica hartwegii*), Sierra skullcap (*Scutellaria bolanderi* ssp. *bolanderi*), Clark's ragwort (*Senecio clarkianus*), small bur reed (*Sparganium natans*), Sierra bladder nut (*Staphylea bolanderi*), narrowpetal wakerobin (*Trillium angustipetalum*), California red huckleberry (*Vaccinium parvifolium*), and Hall's mule ears (*Wyethia elata*).

Proposed facilities actions in the near-term in the Wawona Campground area would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. The Preferred Alternative would restore two acres of riparian habitat in Segment 7. Restoration of this habitat would have a beneficial impact on park rare plant species that occur in riparian areas. Special status plants may be adversely affected in the short term by construction/removal, restoration, and monitoring activities associated with management actions proposed in the Preferred Alternative in Segment 7. Potential adverse impacts include temporary disturbance and loss of habitat, potential loss of individual plants or populations, and the potential introduction and spread of invasive nonnative species. Adhering to proposed mitigation measures presented in Appendix I and avoiding the removal of vegetation, where possible, would minimize these short-term impacts.

Vegetation removed under the Preferred Alternative would not substantially fragment existing native vegetation communities, reduce species diversity, or substantially reduce the overall size or quality of native plant communities in Segment 7 because new construction would primarily occur in or adjacent to previously disturbed locations or in more resilient, upland habitat. Special status plant species would be avoided during construction activities. Adhering to proposed mitigation measures presented in Appendix I and avoiding the removal of vegetation, where possible, would minimize short-term impacts. New construction can promote non-native species because it creates conditions, such as disturbed soil, that are favored by many non-native plants. An increase in non-native plants could result in habitat loss and a competition for resources (i.e., light, water, and nutrients) for the rare plants in Wawona.

Overall, the Preferred Alternative would result in long-term beneficial impacts on special status plants in Segments 5 through 8.

## CHAPTER VI. DETERMINATION OF EFFECTS ON FEDERALLY LISTED OR CANDIDATE SPECIES

The impact on listed or candidate species are analyzed in accordance with USFWS guidelines. Federal agencies must consult with the Fish and Wildlife Service to ensure their actions would not jeopardize the continued existence of any federally listed or proposed threatened or endangered species, or adversely modify designated or proposed critical habitat (Endangered Species Act, section 7(a)(2)). If listed species or their critical habitat are present, the federal agency must determine if the action would have “no effect,” “may effect, not likely to adversely affect,” or “may effect, likely to adversely affect” those species or their habitat. The National Park Service makes the determination of effect for the alternatives following guidance outlined in the *Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conference Activities* (USFWS and NMFS 1998). The following guidance is used to determine impacts whether the species is protected under the Endangered Species Act, listed or identified as sensitive by the state, or identified as sensitive by the park, another federal agency (e.g., BLM or USFS) or a local agency.

This determination of effects is based solely on the Preferred Alternative in the *Draft Merced River Plan* as described in Chapter III of this document, and does not assume any potential mitigation measures. Mitigation measures are recommended in Chapter VII. The following criteria were used to develop determinations:

- **No Effect** – The project (or action) is located outside suitable habitat **and** there would be no disturbance or other direct or indirect impacts on the species. The action would not affect the listed species or its designated critical habitat.
- **May Affect, Not Likely to Adversely Affect** – The project (or action) occurs in suitable habitat or results in indirect impacts on the species, but the effect on the species is likely to be beneficial, discountable, or insignificant. The action may pose effects on listed species or designated critical habitat but given circumstances or mitigation conditions, the effects may be discounted, insignificant, or completely beneficial.
  - a. **Beneficial effects** – contemporaneous positive effects without any adverse effects.
  - b. **Insignificant effects** – relate to the size of the impact and should never reach the scale where take would occur.
  - c. **Discountable effects** – those that are extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur.
- **May Affect, Likely to Adversely Affect** – The project (or action) would have an adverse effect on a listed species as a result of direct, indirect, interrelated, or interdependent actions, and the effect is not discountable, insignificant, or beneficial.

## Determinations for Federally Listed Threatened or Endangered Species

### Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*)

It is the determination of the National Park Service that actions that are proposed in the *Merced River Plan/DEIS* will have no effect on the Sierra Nevada bighorn sheep. The following conclusions have led to this determination:

- There would be no direct or indirect effects on the Sierra Nevada bighorn sheep or its preferred habitat.

### Valley elderberry longhorn beetle (*Desmocerus californicus*)

It is the determination of the National Park Service that the actions proposed in the *Merced River Plan/DEIS* may affect, and are likely to adversely affect, the Valley elderberry longhorn beetle. The following conclusions have led to this determination:

- Elderberry plants grow within the project area. Based on the foregoing analysis, there is a likelihood that “take,” as defined in the Endangered Species Act, may occur.

Elderberry plants, the sole foodplant and habitat for the Valley elderberry longhorn beetle, are abundant in the Merced River canyon in the elevation range of the beetle, especially in the El Portal area. Elderberry plants would be avoided during construction wherever practicable.

## Determinations for Federal Candidate Species

### Whitebark pine (*Pinus albicaulis*)

It is the determination of the National Park Service that actions that are proposed in the *Merced River Plan/DEIS* will have no effect on the whitebark pine. The following conclusions have led to this determination:

- There would be no direct or indirect effects on the whitebark pine or its habitat.

### Yosemite toad (*Anaxyrus canorus*)

It is the determination of the National Park Service that actions that are proposed in the *Merced River Plan/DEIS* may affect, but are not likely to adversely affect, the Yosemite toad. The following conclusions have led to this determination:

- Yosemite toads utilize higher elevation wet meadows, small ponds, and flooded shallow grassy areas in Segments 1 and 5.
- Actions proposed in Segments 1 and 5 are generally habitat restoration projects that would ultimately benefit Yosemite toad.

### **Sierra Nevada yellow-legged frog (*Anaxyrus canorus*)**

It is the determination of the National Park Service that actions that are proposed in the *Merced River Plan/DEIS* may affect, but are not likely to adversely affect, the Sierra Nevada yellow-legged frog. The following conclusions have led to this determination:

- Sierra Nevada yellow-legged frogs utilize aquatic habitats in Segments 1 and 5.
- Actions proposed in Segments 1 and 5 are generally habitat restoration projects that would ultimately benefit Sierra Nevada yellow-legged frog.

### **California wolverine (*Gulo gulo*)**

It is the determination of the National Park Service that actions that are proposed in the *Merced River Plan/DEIS* may affect, but are not likely to adversely affect, the California wolverine. The following conclusions have led to this determination:

- California wolverines have not been verified in Yosemite National Park since 1915; unconfirmed sightings have been reported in 1959 and 1990. However, California wolverine could utilize a variety of habitats in Segments 1 and 5, including wet meadows.
- Actions proposed in Segments 1 and 5 are generally habitat restoration projects that would ultimately benefit California wolverine.

### **Pacific fisher (*Martes pennant pacifica*)**

It is the determination of the National Park Service that actions that are proposed in the *Merced River Plan/DEIS* may affect, but are not likely to adversely affect, the Pacific fisher. The following conclusions have led to this determination:

- Pacific fisher may utilize coniferous forests in Segments 1, 2, 5, and 7.
- Actions proposed in Segments 1 and 5 are generally habitat restoration projects that would ultimately benefit Pacific fisher.
- Although suitable foraging habitat for this species would be impacted by proposed actions in Segments 2 and 7, this species is sensitive to human presence and is not likely to utilize habitats in these areas.

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## **APPENDIX O**

### **DRAFT WETLAND STATEMENT OF FINDINGS**

# **APPENDIX O**

## **WETLAND STATEMENT OF FINDINGS FOR THE DRAFT MERCED WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN**

This Wetlands Statement of Findings (WSOF) characterizes the wetland resources that occur within the project area for the Merced Wild and Scenic River Comprehensive Management Plan (Merced River Plan), describes the impacts the project will likely have on wetland resources, and documents the steps the National Park Service (NPS) will take to avoid, minimize, and offset these impacts. This Wetland Statement of Findings is included in this document for public review to meet the obligations of Executive Order 11990 (Protection of Wetlands), Director's Order 77-1: Wetland Protection, and National Park Service Procedural Manual 77-1: Wetland Protection (2008).

### **PURPOSE OF THIS STATEMENT OF FINDINGS**

Under Directors Order #77-1 for Wetland Protection, Part 2.5 states:

Actions proposed by the NPS that have the potential to have adverse impacts on wetlands will be addressed in an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). If the preferred alternative in an EA or EIS will result in adverse impacts on wetlands, a "Statement of Findings" documenting compliance with this Director's Order (D.O.) and Procedural Manual #77-1 will be completed. Actions that may be excepted from the Statement of Findings requirement are identified in the Procedural Manual.

In #77-1, Section 5.3.4 (3) states:

"...A draft EIS that identifies a preferred alternative that will have adverse impacts on wetlands must be accompanied by a separately identifiable draft WSOF that explains why an alternative with such impacts was chosen and that meets the other requirements identified in Section 5.3.5 of these procedures."

The purpose of this Wetland Statement of Findings is to review the Merced River Plan in sufficient detail to:

- Avoid, to the extent possible, the short-and long-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative
- Describe the effects on wetland values associated with the proposed action
- Provide a thorough description and evaluation of mitigation measures developed to achieve compliance with Executive Order 11990 (Protection of Wetlands) and National Park Service Procedural Manual 77-1: Wetland Protection
- Ensure "no net loss" of wetland functions or values

## CHARACTERISTICS OF EXISTING WETLANDS

### Wetland Extent

There are wetlands and/or riparian habitats in every segment of the Merced River corridor (figures O-1 through O-8). Approximately 1,600 acres of wetland and/or riparian habitat occur within the Merced River corridor. Table O-1 provides a summary of the classes and areal extent of wetland and riparian habitats by corridor segment. Wetland data were obtained from site-specific wetland delineations, if available. National Wetland Inventory data (USFWS 1995), supplemented with data from the Yosemite Parkwide Vegetation Map (1997), were used to describe wetlands in the Merced River corridor in areas where delineation data were not available (site-specific wetland delineation data was only available for limited areas in Yosemite Valley). Data on riparian habitats was taken from the *Merced River and Riparian Vegetation Assessment* (Cardno ENTRIX 2011) for the river corridor through Yosemite Valley. Data from the Yosemite Parkwide Vegetation Map (1997) were used to describe riparian habitats outside of Yosemite Valley. This provides a conservative estimate of wetlands in the project area.

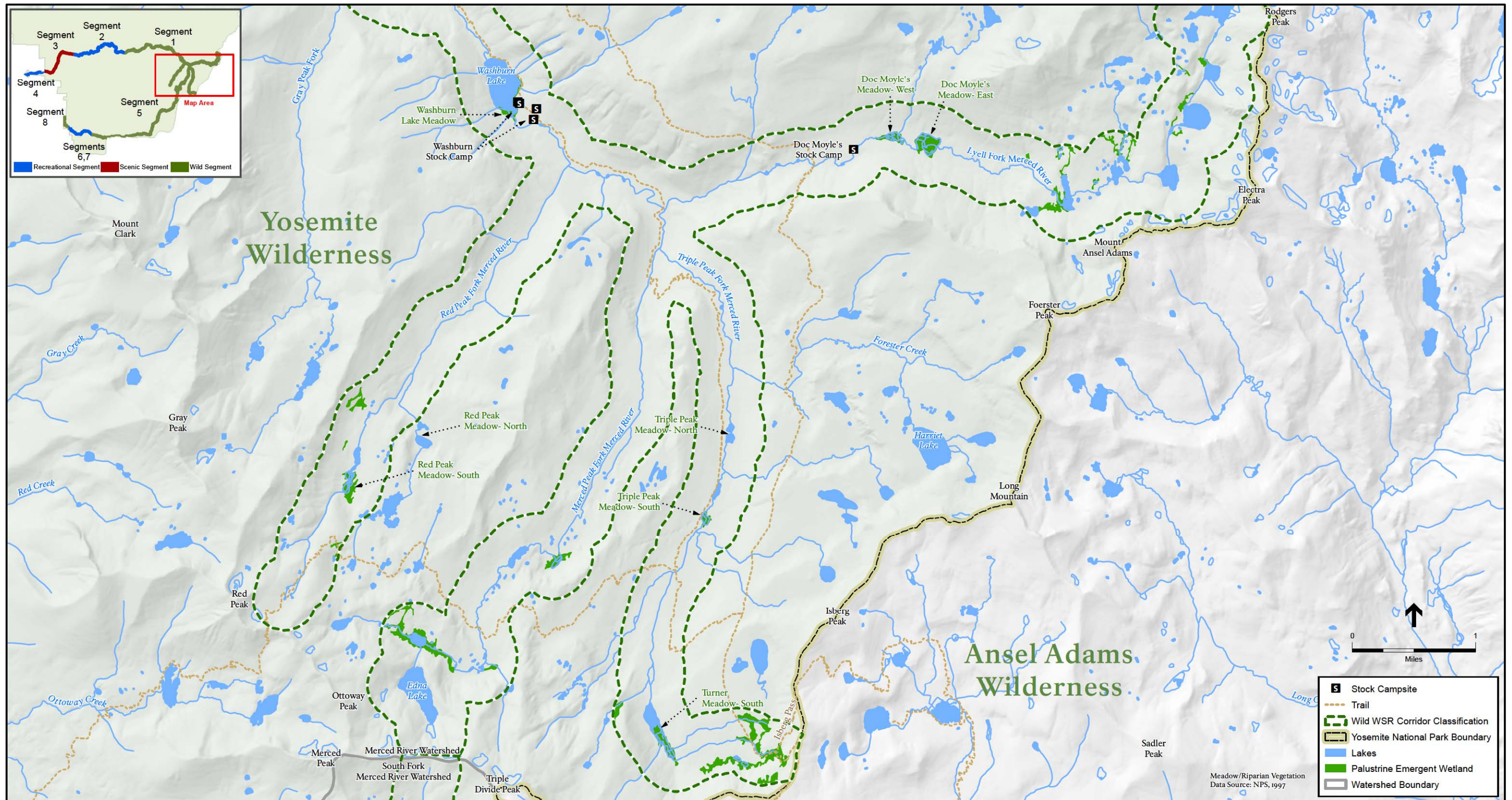
**TABLE O-1: CLASSES AND AREAL EXTENT OF WETLAND HABITATS IN THE MERCED RIVER CORRIDOR**

Wetland Class	Area per Segment (acres)							
Cowardin Class	1	2	3	4	5	6	7	8
Riverine/Lacustrine	404.5	141.0	96.2	42.3	89.5	0.4	64.0	27.7
Palustrine Emergent Wetland (wet meadows)	216.5	261.2	0	1.7	69.8	0	0	0
Palustrine Forested Wetland	0	116.7	11.8	5.2	0.9	0	0	0
Palustrine Scrub Shrub Wetland	10.0	13.7	12.0	4.6	3.3	0	2.5	0
SOURCE: USFWS 1995; NPS 1997; NPS 2011								

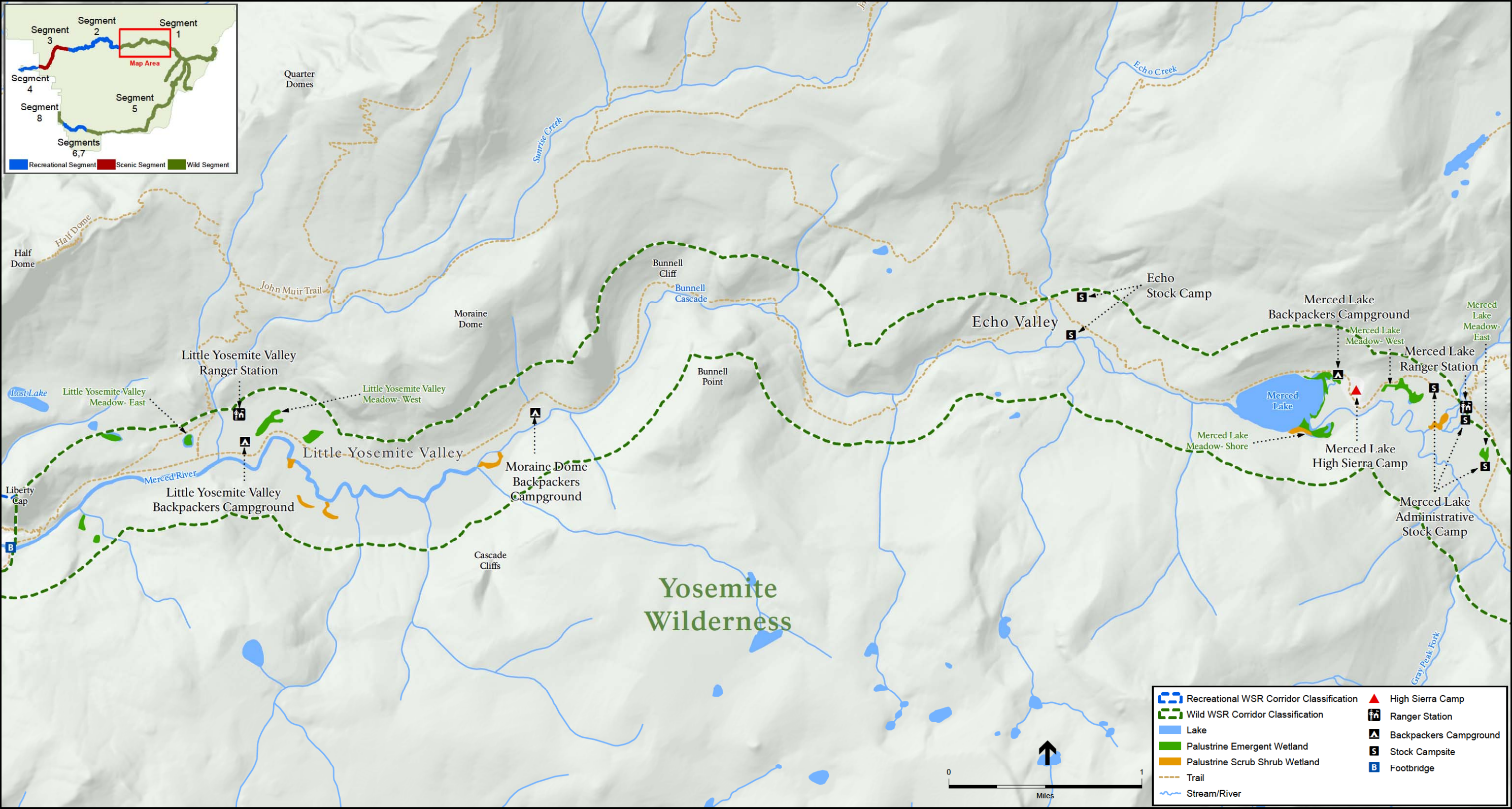
The NPS classifies and maps wetland habitats using a system developed by wetland ecologists and an interagency team for the U.S. Fish and Wildlife Service (USFWS), which is often referred to as the Cowardin classification system (Cowardin et al. 1979). Wetlands, as defined by the USFWS, are transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water (Cowardin et al. 1979). For purposes of this classification, wetlands must have one or more of the following attributes:

- The land predominantly supports hydrophytes, at least periodically. Hydrophytes are plants that grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.
- The substrate is predominantly undrained hydric soils. Hydric soils are wet long enough to periodically produce anaerobic conditions.
- The substrate is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin et al. 1979).









SOURCE: NPS, 1997, 2011

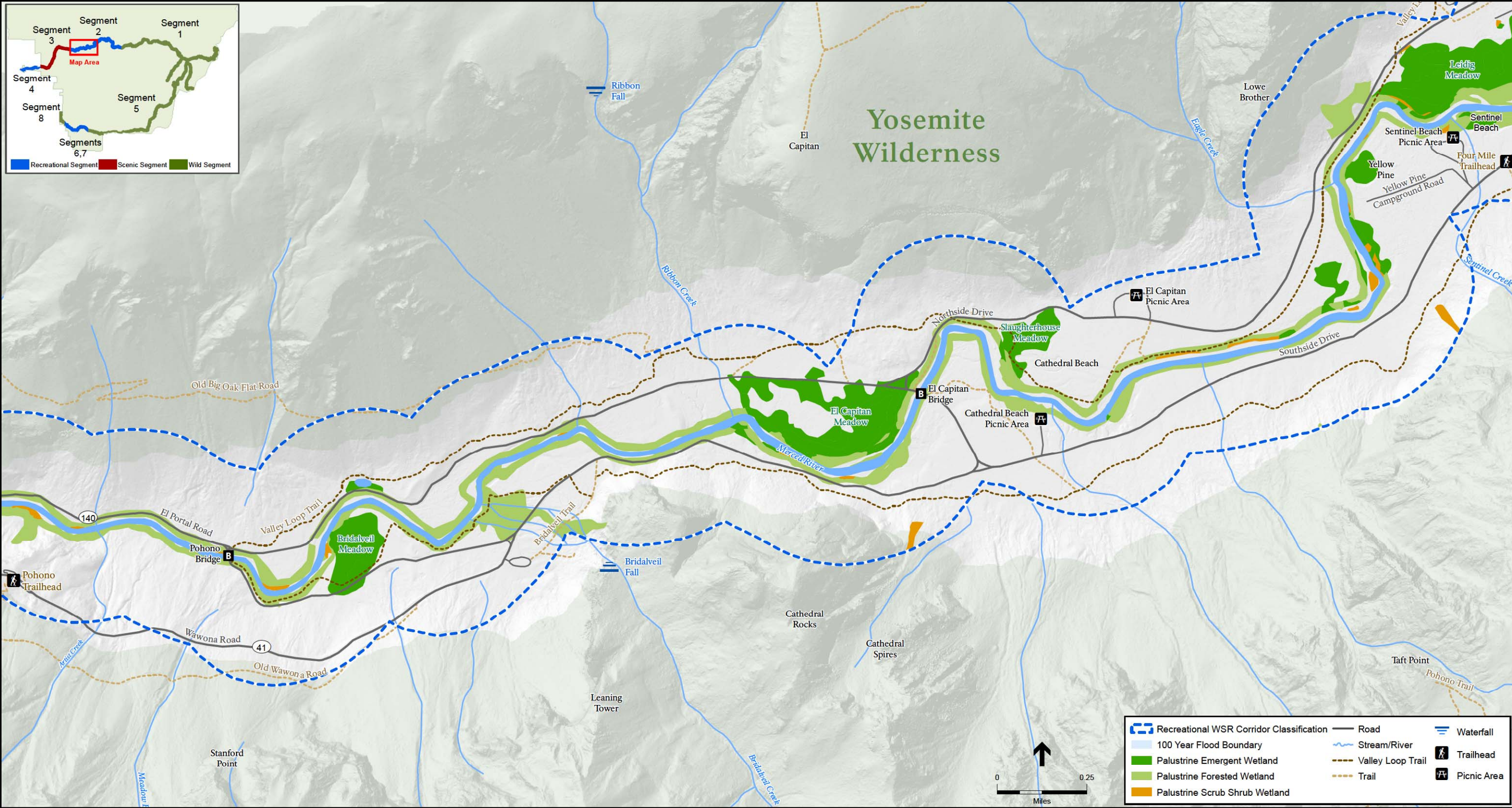
Merced River Comprehensive Management Plan and EIS . 210436

**Figure O-2**  
Segment 1 - Little Yosemite Valley and  
Merced Lake High Sierra Camp Wetlands









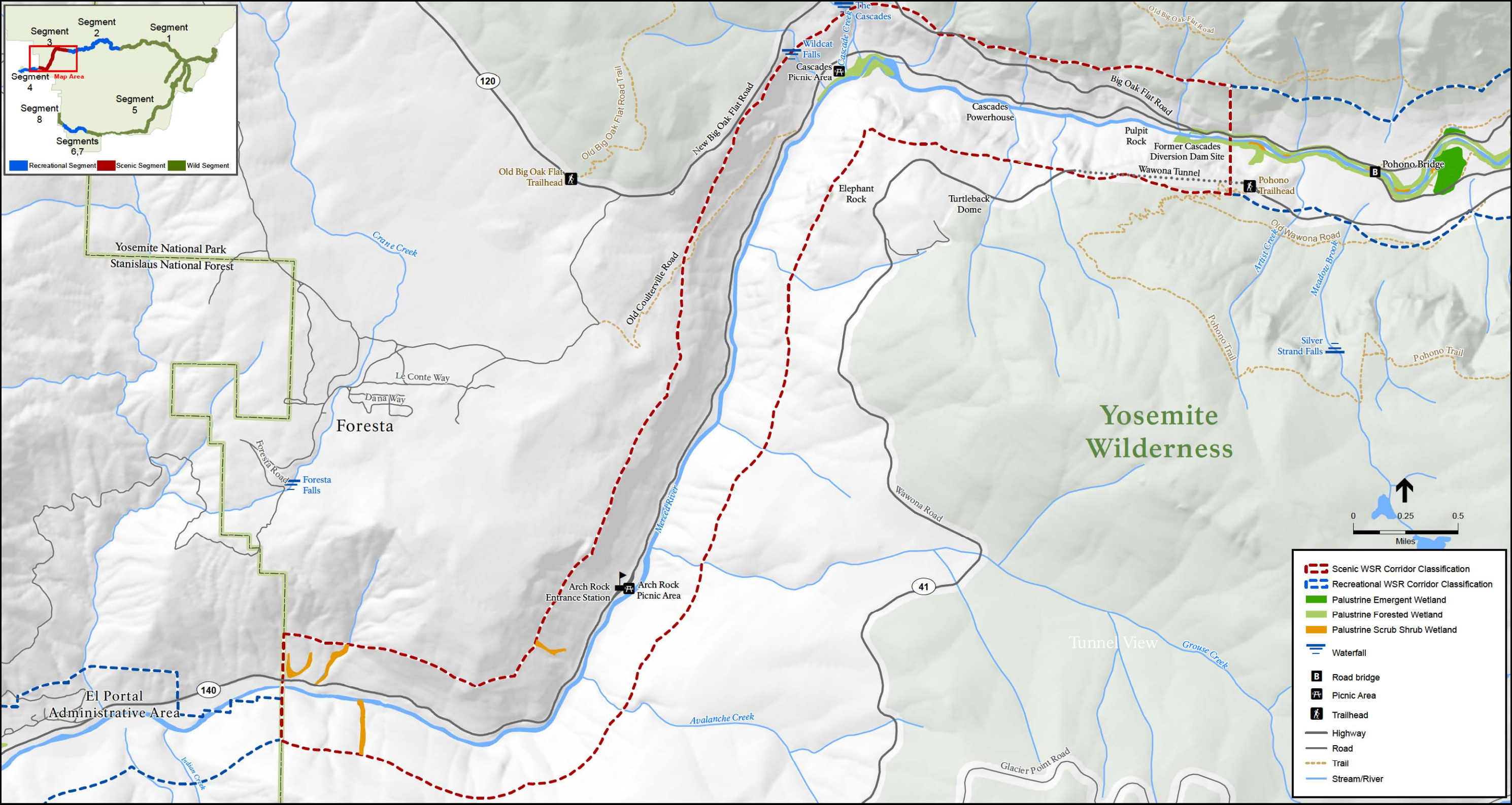
SOURCE: NPS, 1997, 2010, 2011

Merced River Comprehensive Management Plan and EIS . 210436

**Figure O-4**

Segment 2 - El Capitan Meadow, Cathedral Beach, and Sentinel Beach Wetlands





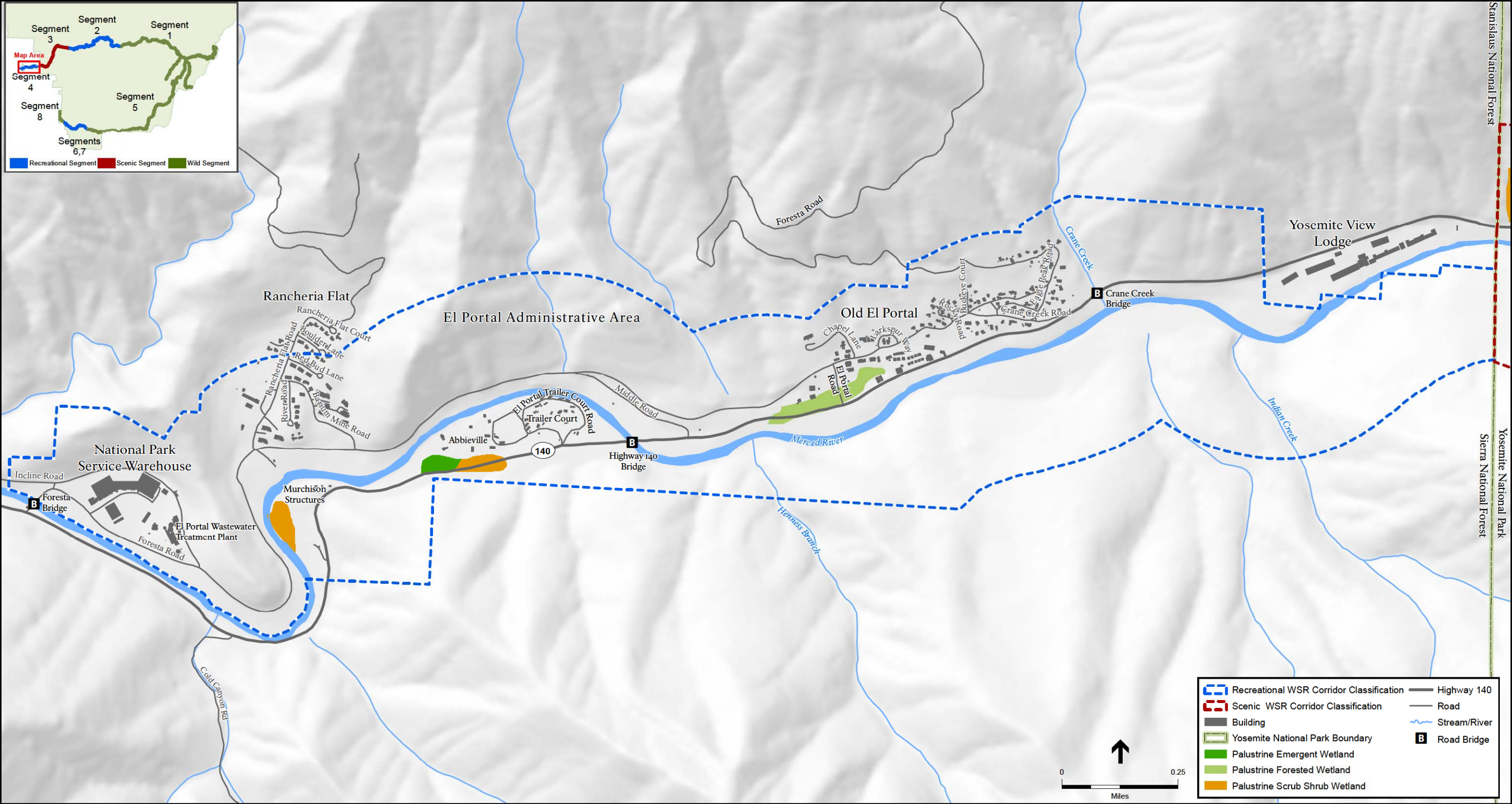
SOURCE: NPS, 1997, 2010, 2011

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**Figure O-5**

**Segment 3 - Merced Gorge Wetlands**

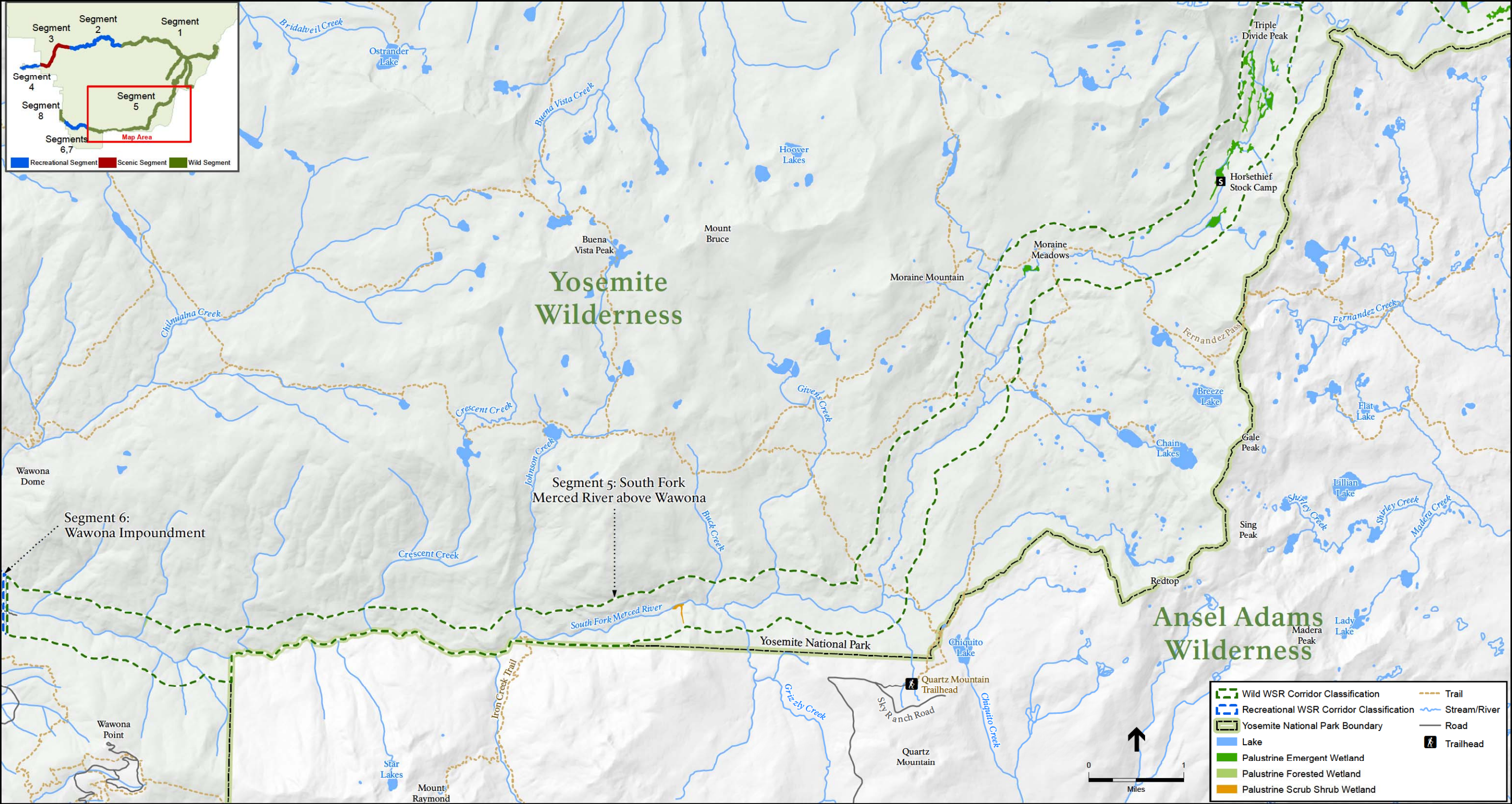




SOURCE: NPS, 1997, 2011

**Figure O-6**  
Segment 4 – El Portal Wetlands

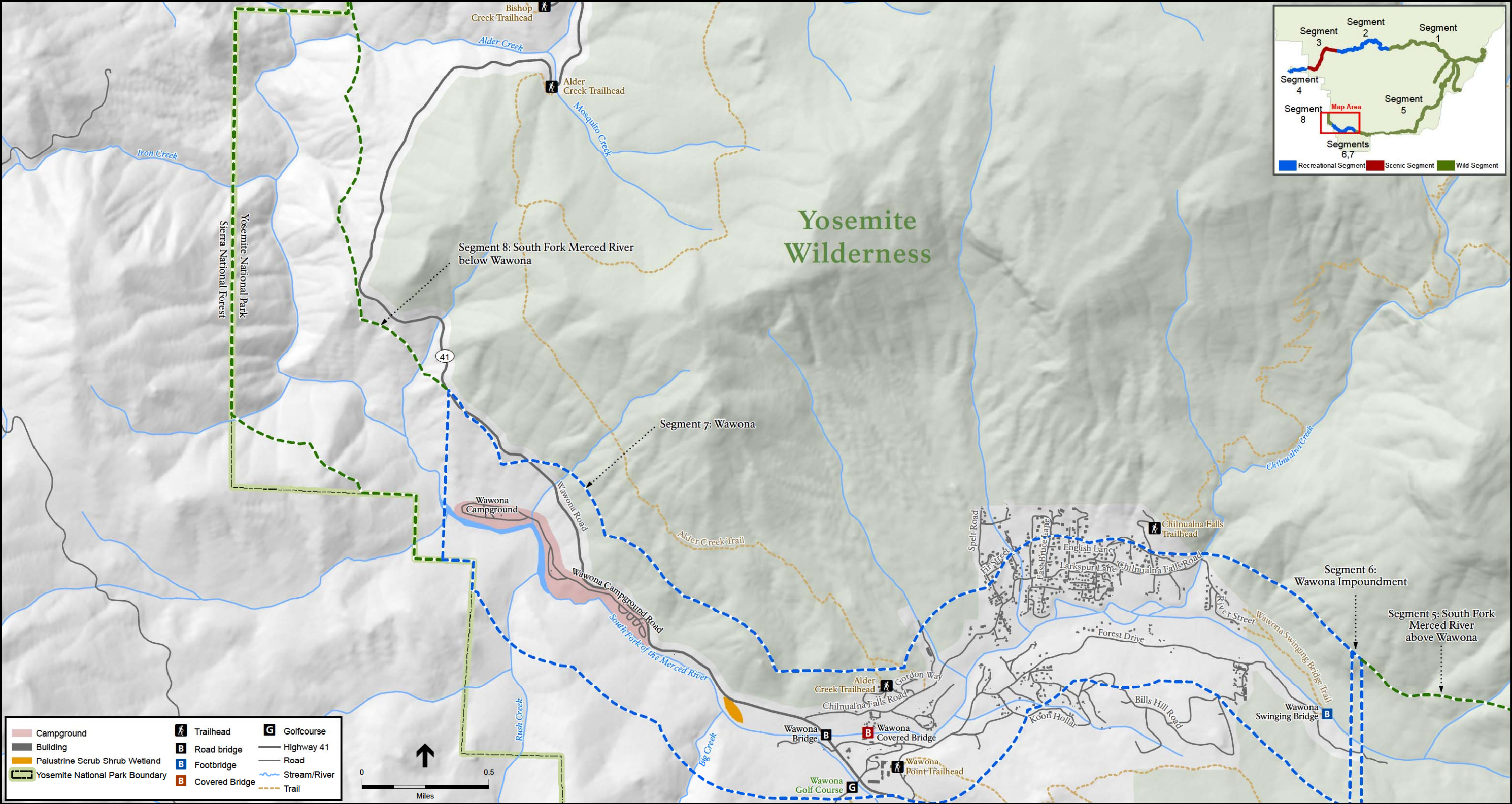




SOURCE: NPS, 1997, 2011

**Figure O-7**  
Segment 5 - South Fork Merced  
River Above Wawona Wetlands





SOURCE: NPS, 1997, 2011

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**Figure O-8**  
Segments 6, 7, and 8 - Wawona Impoundment,  
Wawona, and the South Fork Merced  
River Below Wawona Wetlands

The U.S. Army Corps of Engineers (Corps) uses three wetland parameters to define wetlands for regulatory purposes: hydrophytic vegetation, hydric soil, and wetland hydrology. When all three parameters are present, the wetland is considered a jurisdictional wetland. The Cowardin system defines more habitat types as wetlands than does the Corps definition as it recognizes many unvegetated sites (e.g., mudflats, stream shallows, saline lakeshores, playas) or sites lacking soil (e.g., rocky shores, gravel beaches) as wetland habitats if wetland hydrology is present. The reason these sites lack hydrophytic vegetation and/or hydric soil is due to natural chemical or physical factors. Although the Corps does not consider these sites to be wetlands, they are still subject to regulations under section 404 of the CWA as other waters of the United States. For purposes of this document, both Cowardin wetlands and waters of the United States as defined by the Corps are referred to as wetlands.

## **Wetland Characteristics**

Specific wetland classes identified within the Merced River corridor include riverine (rivers, creeks, and streams), palustrine (shallow ponds, riparian wetlands, wet meadows, marshes), and lacustrine (lakes and ponds). Using the Cowardin classification system, specific wetland and deepwater classes within the Merced River corridor include:

- *Riverine upper perennial* – main channels of the Merced River and the South Fork Merced River (may be wetland or deepwater depending on depth)
- *Riverine intermittent* – intermittent tributaries to the Merced River and South Fork Merced River (wetlands)
- *Palustrine emergent* – emergent wetland habitat (marsh, meadow) along the Merced River and South Fork Merced River subject to various flooding regimes
- *Palustrine forested* – riparian forest wetland habitat along the Merced River and South Fork Merced River subject to various flooding regimes
- *Palustrine scrub shrub* – riparian scrub (e.g., willow) wetland habitat along the Merced River and South Fork Merced River and its tributaries subject to various flooding regimes
- *Lacustrine littoral* – shallow lake margins that are less than 2 meters deep at low water and have less than 30% vegetation cover  
*Lacustrine limnetic* – portions of lakes that are more than 2 meters deep at low water (e.g., Merced Lake, Washburn Lake) along the Merced River (deepwater habitat)

The following discussion provides general descriptions for each wetland class identified within the Merced River ecosystem.

**Riverine Upper Perennial.** Riverine upper perennial habitat within the corridor includes the open and flowing water of the Merced River and the South Fork Merced River. It is the permanently flooded rock-, cobble-, or sand-bottom channel with little to no in-stream vegetation. Occasional sandbars form within and at the channel edge and typically support willows and emergent (grasses and herbs) vegetation. Based on the NPS guidelines, the majority of the main stem of the Merced River and the South Fork Merced River would be classified as riverine upper perennial wetland. Channel portions that lie at a depth of 2

meters below low water would be considered deep water. The main channel of the Merced River and the South Fork Merced River would likely be considered as jurisdictional by the Corps under section 404 of the CWA, not as wetlands but as other waters of the United States.

**Riverine Intermittent.** Numerous riverine intermittent drainages (other waters of the United States) are tributary to the main stem Merced River and the South Fork Merced River. Almost all riverine intermittent drainages within the river corridor are classified as Cowardin wetlands and waters of the United States. These drainages often have a nonsoil substrate that is saturated and/or covered by shallow water at some time during the growing season. These wetlands are typically narrow and encompass the lowest portion of creekbeds. Very little wetland vegetation is found in these areas because of the intermittent nature of the flows within the drainage channels. All aboveground drainages within the river corridor are subject to the NPS protection policies under Executive Order 11990. These drainages are classified as other waters of the United States and would be subject to sections 401 and 404 of the CWA.

**Palustrine Emergent.** Palustrine emergent wetland habitat includes portions of alpine, subalpine, and montane meadows and seeps. These wetland soils are generally deep and peaty, remaining saturated year-round or on a seasonal basis. Vegetation is dominated by grasses, sedges, rushes, and perennial herbs. The meadow wetlands in Yosemite National Park play a particularly critical role in the Merced River ecosystem. High spring flows create wet areas in side channels, low-lying wetlands, meadows, and cutoff channels. These areas support the concentration of organic matter, nutrients, microorganisms, and aquatic invertebrates throughout the relatively dry summer. When the flush of winter or spring flooding occurs, this stored aquatic biomass is washed into the main river channel, forming the base of the aquatic food chain. Examples of palustrine wetlands include portions of Cook's Meadow and meadows adjacent to Washburn and Merced Lakes. These meadow portions are considered wetlands under the Cowardin system, and portions of meadows may also meet the Corps' wetland criteria. Delineated palustrine emergent wetlands are subject to the NPS protection policies under Executive Order 11990 and section 404 of the CWA.

**Palustrine Forested.** Palustrine forested wetlands are the riparian forest habitats along the main stem of the Merced River and South Fork Merced River that are regularly inundated by normal high-water or flood flows. Palustrine forests within the upper reaches of the main stem of the Merced River and South Fork Merced River consist mainly of evergreen pines and firs, with occasional aspens. In Yosemite Valley, where the river is broad, shallow, and slow-moving, deciduous cottonwoods, willows, and alders dominate the riparian corridor. Substrate under the palustrine forest community varies from rock, gravel, sand, clays, loams, and mud. These areas are classified as either wetland or other waters of the United States by the Corps, depending on site-specific vegetation, soils, and hydrologic conditions, and would be subject to section 401 and/or 404 of the CWA.

**Palustrine Scrub Shrub.** This habitat type occurs sporadically along the banks of the main stem of the Merced River, the South Fork Merced River, and at lake margins. It is regularly inundated by normal high-water or flood flows. This habitat is dominated by various willows and often intergrades with meadow (palustrine emergent) and riparian (palustrine forest) communities. These communities are typically considered wetlands under the Cowardin system, would be subject to the NPS protection policies under Executive Order 11990, and typically meet the Corps' wetland criteria. These areas may



meet the Corps' criteria of a wetland or other waters of the United States, depending on site-specific vegetation, soils, and hydrologic conditions, and may be subject to sections 401 and/or 404 of the CWA.

**Lacustrine Littoral.** Lacustrine littoral includes all wetland habitats within a lacustrine system. This classification extends from the shoreward boundary of the system to a depth of 2 meters below low water or to the maximum extent of emergent vegetation. These habitats are adjacent to deep-water lakes and reservoirs along the Merced River. These communities are typically considered wetlands under the Cowardin system, would be subject to the NPS protection policies under Executive Order 11990, and may meet the Corps' wetland criteria, depending on site-specific vegetation, soils, and hydrologic conditions, and may be subject to sections 401 and/or 404 of the CWA.

**Lacustrine Limnetic.** Lacustrine limnetic refers to deepwater lakes and reservoirs, such as Merced and Washburn lakes. Both lakes were formed along the Merced River by glacial activity. In-lake vegetation is typically limited to rooted aquatic grasses, floating vascular plants, and algae. Meadow (palustrine emergent) and riparian (palustrine forest and palustrine scrub shrub) communities generally border lake margins.

These lakes provide important habitat for fish, amphibians, reptiles, and other aquatic species. Substrate varies from rock, gravel, sand, and mud. Lacustrine limnetic (deepwater lakes and ponds) are classified as deepwater habitat based on the Cowardin system. These areas are typically classified as other waters of the United States by the Corps and would be subject to regulation under section 404 of the CWA.

### ***Segment Descriptions***

The characteristics of the individual segments within the Merced River corridor, including vegetation, connectivity and integrity have been summarized from the Draft EIS below.

#### **Segment 1: Merced River Above Nevada Fall**

Numerous small wetland meadows and adjacent riparian habitat are present in the upper Wilderness reaches of the Merced River corridor above Nevada Fall. These high-elevation meadows typically occur on fine-textured, permanently to semi-permanently wet soils generally associated with perennial streams, seeps, lake margins, or depressions. Vegetation consists of low-growing, native, tussock-forming grasses, sedges, rushes, and perennial herbs. Merced and Washburn lakes were formed where the Merced River canyon was carved by glaciers. In-lake vegetation is typically limited to rooted aquatic grasses, floating vascular plants, and algae. Meadow communities border lake margins. These wetland plant communities are hydrologically driven by the groundwater and flooding regime of the Merced River.

Much of the Merced River above Nevada Fall is bordered by a narrow riparian zone influenced by stream gradient, slope, sedimentation, and aspect. High-elevation tributaries to the Merced River are sparsely vegetated with scattered patches of alpine riparian scrub and alpine willow thickets. As the river descends and the gradient becomes gentler, lodgepole pines, aspens (*Populus tremuloides*), willows (*Salix* spp.), and alders (*Alnus* spp.) become more prevalent. Riparian communities of the upper Merced River are generally intact, except in a few locations where human use is intense.

## Segment 2: Yosemite Valley

Wetlands in Yosemite Valley are formed in low-gradient land adjacent to the Merced River, its tributaries, or other bodies of water that are, at least periodically, influenced by flooding or high water tables. Wetlands within Yosemite Valley have undergone systematic alteration since the middle of the 19th century as they were grazed, farmed, and used as recreational sites and corridors for travel. Other alterations that took place in the early 20th century include drainage ditches that were constructed to dewater wet meadows to reduce mosquito breeding areas and provide open land for grazing and agriculture. Many of these drainage ditches have not been filled in and continue to dewater wet meadows in Yosemite Valley. Road construction has involved drainage measures and diversion of surface water adjacent to many of the valley's wetlands. This wetland complex was formerly much more interrelated and contiguous but has been fragmented by roads, trails, and infrastructure.

Riparian zones in Yosemite Valley extend outward from bank edges of the Merced River and its tributaries into adjacent meadow and forest communities. Situated at the interface between terrestrial and aquatic ecosystems, the riparian zone acts to buffer hydrology and erosional cycles, control and regulate biogeochemical cycles of nitrogen and other key nutrients, limit fire movements, and create unique microclimates for animal species. Riparian zones in Yosemite Valley are characterized by broadleaf deciduous trees, such as white alder (*Alnus rhombifolia*), black cottonwood (*Populus trichocarpa*), big-leaf maple (*Acer macrophyllum*), white fir, and willow species. Riparian vegetation is regularly disturbed by the deposition and removal of soil and the force of floodwaters. Plants in this zone colonize newly formed river-edge deposits readily. The distribution of riparian communities varies with soil saturation and frequency of disturbance.

Primary stressors on the condition of riparian habitats along the Merced River are related to high recreation use, channel stabilization measures, and dewatering due to infrastructure. Water, wastewater and electric lines and other utility infrastructure are located throughout Yosemite Valley (Segment 2), including some within wetland areas. Restoration efforts (prescribed burns, invasive plant eradication, fencing, and increasing inundation levels through restoration of natural drainage patterns, among others) have generally been successful at improving the overall condition of the Valley's riparian communities. However, certain riparian areas within the Valley continue to experience vegetation trampling and bank erosion from heavy recreation use. Additional riparian vegetation impacts are occurring along reaches that have been armored by revetments or other defensive structures for the protection of structures (i.e., bridges).

## Segment 3 and 4: Merced Gorge and El Portal

As the Merced River cascades through the gorge, the channel gradient and bank slopes steepen, the river channel narrows, and the floodplains become considerably smaller than those of the Yosemite Valley. The steep gradient, combined with the boulders and cobbles of the riverbed and bank, forms a series of continuous rapids between Yosemite Valley and El Portal. The Merced River gorge is lined with a narrow band of riparian vegetation along the river course.

Flooding has been an important aspect of the development of riparian communities along the Merced River and its tributaries that intersect drier adjacent vegetation types of El Portal. Localized seasonal

flooding creates debris dams in tributary channels, thus furthering a diversity of scour and depositional soils for riparian species. On the Merced River, natural flooding and vegetative patterns are influenced by the construction of levees and application of riprap to confine the river. These structures have destroyed riparian vegetation and have limited their reestablishment in some places.

In the El Portal area, riparian communities occur along tributaries of the Merced River, on flat topographical shaded terraces above the river, in backwater channels, and in areas where runoff from upland sites collects in natural depressions. Native Oregon ash (*Fraxinus latifolia*), willow, and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) trees occur in the wetter areas, as well as orchard components in some locations. Foothill pines and valley oaks tend to dominate the drier terraces adjacent to riparian sites.

Oxbows, river terraces, and seasonal river channels were a part of the riparian wetlands of the area, but have been affected by early to mid-20th century development in what is now the El Portal Administrative Site. Many of the sites that would be characterized as palustrine have been affected to some degree. The remaining wetland areas that appear on the USFWS (1995) wetland inventory are riverine perennial wetlands and are in proximity to the Merced River or other stream drainages. Direct human intrusion into the riparian areas of this river zone, especially to the south, is minimal because of the topography and difficulty of access.

#### **Segment 5 and 8: South Fork Merced River Above and Below Wawona**

From its headwaters, the South Fork Merced River flows west at a relatively consistent but steep gradient through a glaciated alpine environment and then enters a V-shaped, unglaciated river valley. The upper South Fork supports limited riparian vegetation, primarily due to steep topography and high-velocity flows. The steep gradients along the upper and lower South Fork Merced River are not conducive to the establishment of an extensive riparian zone. Typical riparian species — willow, alder, aspen, and maple — are restricted to a narrow fringe along the river. High-elevation tributaries to the South Fork Merced River are either unvegetated, high-velocity, and rocky in nature or are only sparsely vegetated. Subalpine meadows along the South Fork Merced River are similar in composition to those described for the upper main stem of the Merced River. Vegetation in alpine lakes is typically limited to rooted aquatic grasses, floating vascular plants, and algae. The upper South Fork is generally pristine and remains virtually undisturbed by human-related effects. The steep gradient below Wawona along the South Fork prevents the establishment of an extensive riparian zone. The limited riparian vegetation along the lower reach remains relatively untouched by human intrusion.

#### **Segment 6 and 7: Wawona**

In the Wawona area, the Merced River meanders through a large floodplain meadow (part of a deep alluvial valley) and has substantial gravel bars within the channel. As the river descends and the gradient becomes gentler, riparian vegetation (willows and alders) becomes more prevalent. Willows often colonize sandbars that are deposited at the margins of or within the river channel. In this area, the riparian corridor resembles the riparian corridor seen along the Merced River as it flows through Yosemite Valley. As with certain points within Yosemite Valley, trampling of riparian vegetation and associated erosion does occur in this area, resulting from heavy use in the vicinity of the Wawona Campground.



## THE PREFERRED ACTION IN THE MERCED RIVER PLAN

The Preferred Alternative of the *Merced River Plan/DEIS* would include significant restoration within 100 feet of the river and in meadow and riparian areas, maintaining daily visitation in Yosemite Valley to accommodate the same peak levels observed in recent years, reducing unnecessary facilities and services, and converting facilities from administrative use to public use where feasible. Alternative 5 envisions broad ecological restoration goals, including essential restoration of riverbanks and meadow and riparian habitat. Proposed restoration actions are feasible and achievable, and leverage engineering and design features to enhance meadow and floodplain connectivity and free-flowing condition. Much of the development footprint within 100 feet of the river is removed corridorwide. Targeted infrastructure within the bed and banks of the river is removed, and those areas ecologically restored.

Actions to manage visitor use and facilities under Alternative 5, specifically those concerning vehicle access and overnight accommodations, would result in a 2% increase in lodging accommodations. The campsite inventory would increase by 29% in the Merced River corridor and 37% in Yosemite Valley. All campsites within 100 feet of the river would be removed. Campsite losses would be offset with the addition of new camping adjacent to Upper Pines Campground and east of the Camp 4 Campground, as well as new sites west of Backpackers Campground, in the former Upper River Campground area, and east of El Capitan Picnic Area at Eagle Creek. Under Alternative 5, there would be a net increase of 13% in Yosemite Valley overnight use. This would largely result from the increase in units at Curry Village. Management actions related to lodging would focus on removing lodging from the ordinary high water mark and Housekeeping Camp, and slightly reducing lodging in wilderness. Tent cabins in the Boys Town area would be replaced with hard-sided lodging in Curry Village to increase the availability of year-round accommodations.

Alternative 5 would restore approximately 203 acres of vegetation, including 40.52 acres of wetlands, as a result of actions common to Alternatives 2-6 in conjunction with actions specific to Alternative 5. Actions to manage visitor use and facilities would result in the loss of approximately 36.89 acres of vegetation and 2.67 acres of wetlands as a result of actions specific to Alternative 5.

For a detailed description of the Preferred Alternative, refer to Vol. I, Chapter 8 of the *Draft Merced River Plan/DEIS* (NPS 2012).

## ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION ON WETLANDS

The purpose of the Merced River Plan is to provide a comprehensive management plan for the protection of the Merced River's free-flowing condition, water quality, and the values that make the river worthy of designation. The preferred alternative, Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration, includes management action in Segments 1-8 of the Merced River corridor which would affect wetlands. Though the overall impact would be long-term and beneficial, some localized actions would have an adverse impact on wetlands. A more detailed description of Alternative 5 is included in the "Alternatives" (Chapter 8) of the *Merced River Plan/DEIS*. The following is a summary of actions that could have an effect on wetlands. A summary of cumulative impacts follows.

## **Proposed New Development in the Preferred Alternative of the *Merced River Plan/DEIS***

### ***Segment 2: Yosemite Valley***

Construction activities associated with new development in Segment 2 would result in direct, temporary and permanent losses of native vegetation as well as the redevelopment of existing developed areas. Outside of previously developed areas, the majority of new development in Segment 2 would occur in upland habitats and would not directly impact wetlands. However, direct impacts to wetlands would occur at Curry Village, Yosemite Village Day-use Parking Area, and Yosemite Lodge and Camp 4 (see **figures O-9 through O-12** and **table O-2**). Construction activities at Curry Village would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands associated with Stoneman Meadow and intermittent channels flowing through the area. Approximately 0.06 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the resigned overnight visitor accommodations at Boys Town in Curry Village under Alternative 5. Construction activities at the Yosemite Village Day-use Parking Area would result in direct, temporary and permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands located adjacent to the Northside Drive and Sentinel Crossover intersection, palustrine forested wetlands associated with the Merced River, and intermittent channels flowing through the area. Approximately 2.56 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the redesign of the Yosemite Village Day-use Parking Area and associated intersection and roadway improvements by the proposed actions under Alternative 5. Construction activities at Yosemite Lodge and Camp 4 would result in direct, permanent losses of federally protected wetlands. Impacts to wetlands would occur in palustrine emergent wetlands and along the Merced River and in intermittent channels flowing through the area. Approximately 0.05 acres of potentially jurisdictional wetland features would be directly and permanently impacted by the Yosemite Lodge Parking Area and replacement of temporary housing at Highland Court with new permanent housing under Alternative 5.

**TABLE O-2: SUMMARY OF WETLAND IMPACTS IN SEGMENT 2 – ALTERNATIVE 5**

<b>Wetland Type</b>	<b>Curry Village</b>	<b>Camp 6 and Yosemite Village</b>	<b>Yosemite Lodge and Camp 4</b>	<b>Total</b>
Palustrine Emergent	0.04	1.21	0.01	1.26
Palustrine Forested	0	0.96	0	0.96
Riverine Intermittent	0.02	0.39	0.03	0.44
Riverine Perennial	0	0	0.01	0.01
SOURCE: NPS 2012c				

Losses to these wetlands would occur through site clearing, filling, grading, and subsequent development. Wetlands that cannot be avoided and would be permanently filled must be compensated to result in “no net loss” of wetlands. Adherence to proposed best management practices and

mitigation measures, and avoidance of wetlands during construction where possible, would reduce direct impacts to wetlands to local, long-term, moderate and adverse.

Construction activities associated with new development in Segment 2 may also generate indirect impacts to wetlands. Construction would involve activities such as grading and excavation that would generate loose, erodible soils. These activities could result in substantial erosion off-site to adjacent wetlands, resulting in decreases in water quality due to sedimentation. Other indirect impacts include potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime; human intrusion into wetlands; and temporary impacts to wetlands. However, post-construction, temporarily impacted areas would be restored. Adherence to proposed best management practices and mitigation measures, and avoidance of wetlands during construction where possible, would reduce indirect impacts to wetlands to local, long-term, minor and adverse.

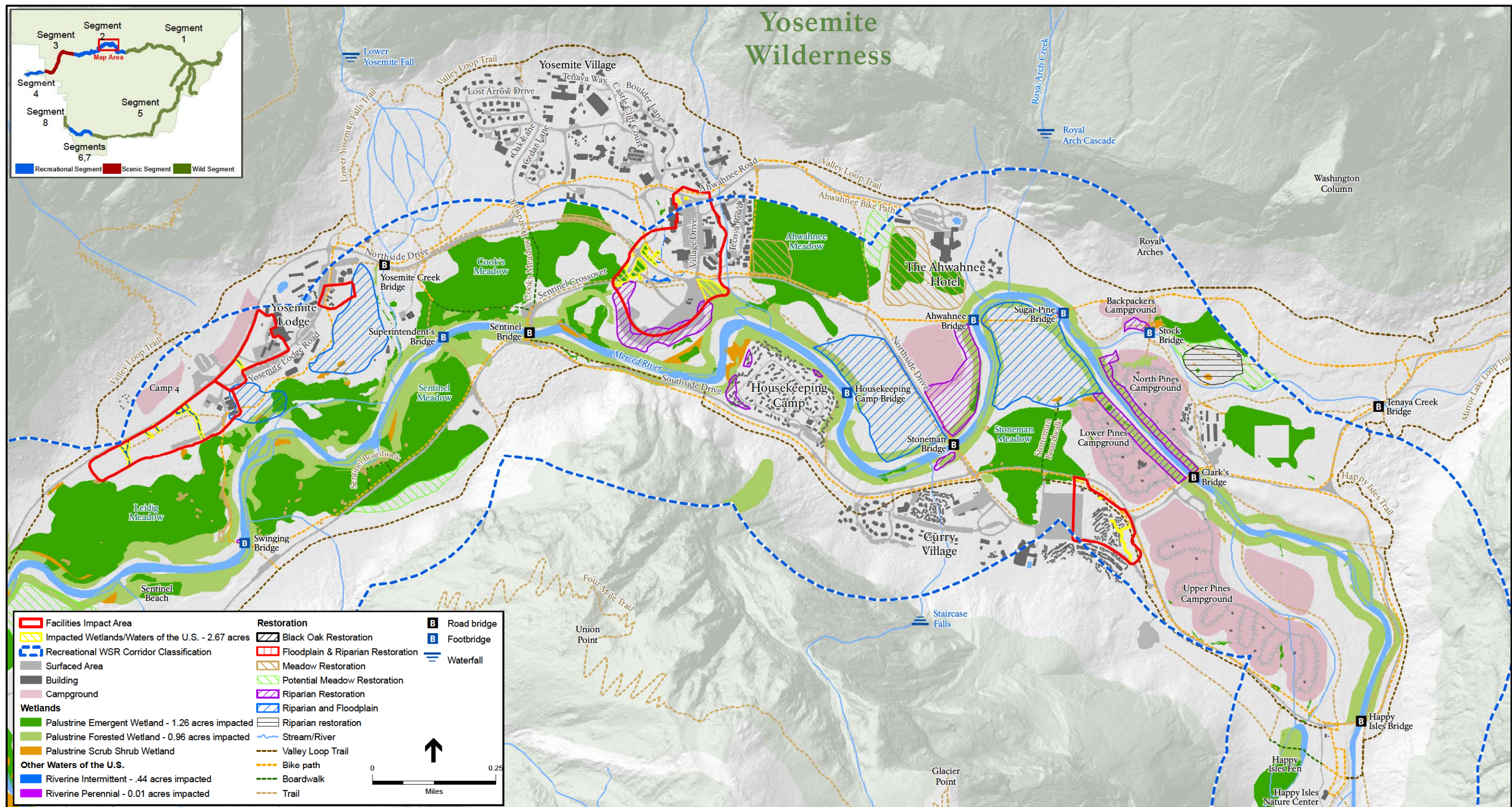
#### **Segment 4: El Portal**

Construction activities associated with new development in Segment 4 would result in direct, temporary and permanent losses of native vegetation as well as the redevelopment of existing developed areas. Outside of previously developed areas, new development in Segment 4 would occur in upland habitats and would not directly impact wetlands. However, construction activities associated with the El Portal Remote Visitor Parking, the removal of Odger's Fuel Storage Facility, and restoration of the Greenemeyer Sandpit may generate indirect impacts to wetlands. Construction would involve activities such as grading, excavation, and demolition that would generate loose, erodible soils. These activities could result in substantial erosion off-site to adjacent wetlands, resulting in decreases in water quality due to sedimentation. Other indirect impacts include potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime; human intrusion into wetlands; and temporary impacts to wetlands. However, post-construction, temporarily impacted areas would be restored. Adherence to proposed best management practices and mitigation measures, and avoidance of wetlands during construction where possible, would reduce indirect impacts to wetlands to local, long-term, minor and adverse.

#### **Segment 7: Wawona**

Construction activities associated with new development in Segment 7 would result in direct, temporary and permanent losses of native vegetation as well as the redevelopment of existing developed areas. Outside of previously developed areas, new development in Segment 7 would occur in upland habitats and would not directly impact wetlands. However, construction activities associated with new development in Segment 7 may generate indirect impacts to channels and waters of the US. Construction would involve activities such as grading and excavation that would generate loose, erodible soils. These activities could result in substantial erosion off-site to adjacent wetlands, resulting in decreases in water quality due to sedimentation. Other indirect impacts include potential modifications to flow, circulation, hydroperiod, or other aspects of the hydrologic regime; human intrusion into wetlands; and temporary impacts to wetlands. However, post-construction, temporarily impacted areas would be restored. Adherence to proposed best management practices and mitigation measures, and avoidance of wetlands during construction where possible, would reduce indirect impacts to wetlands to local, long-term, minor and adverse.





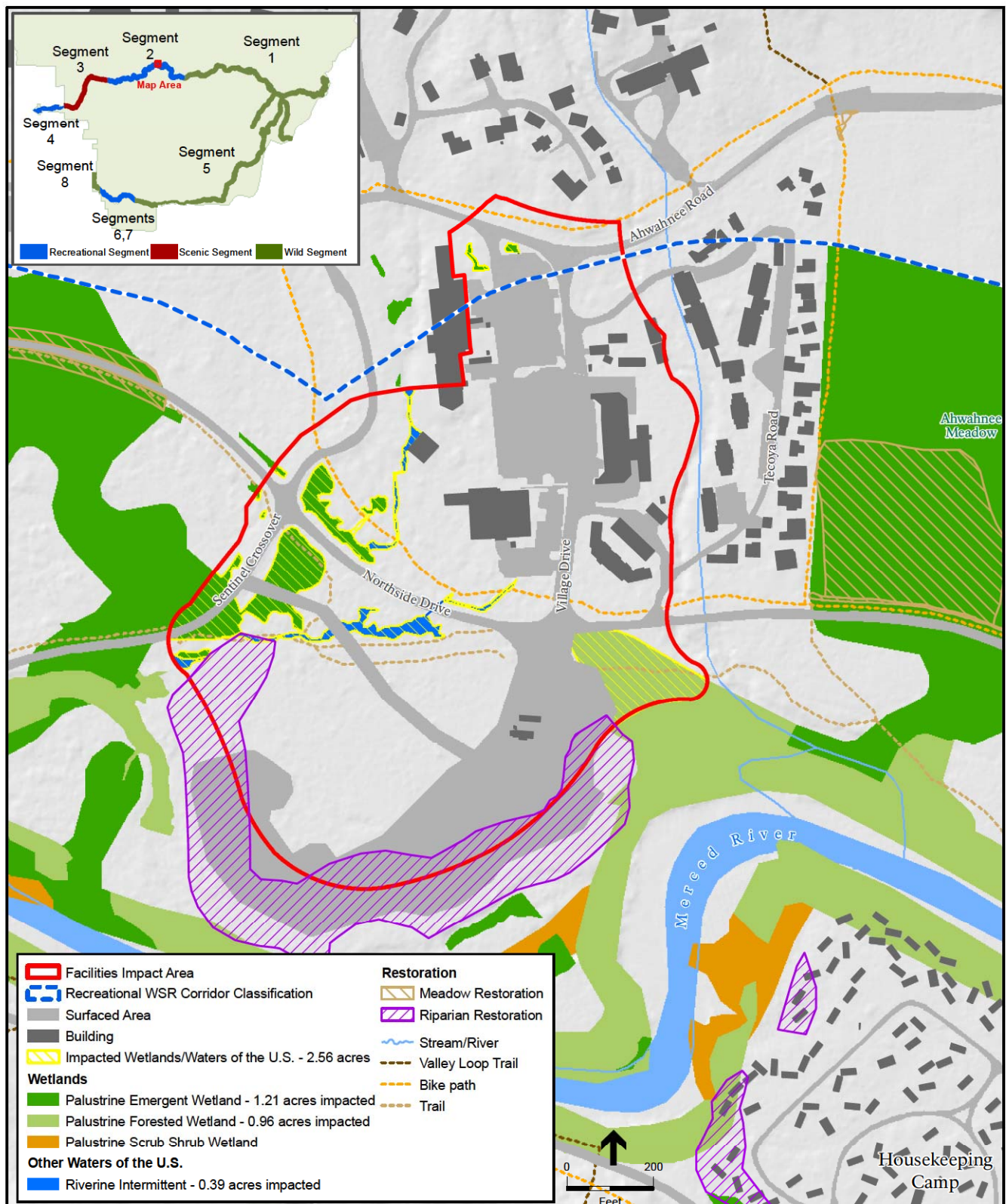
SOURCE: NPS, 1997, 2006, 2010, 2011

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**Figure O-9**  
Segment 2 - Overview of Preferred  
Alternative Wetland Impacts



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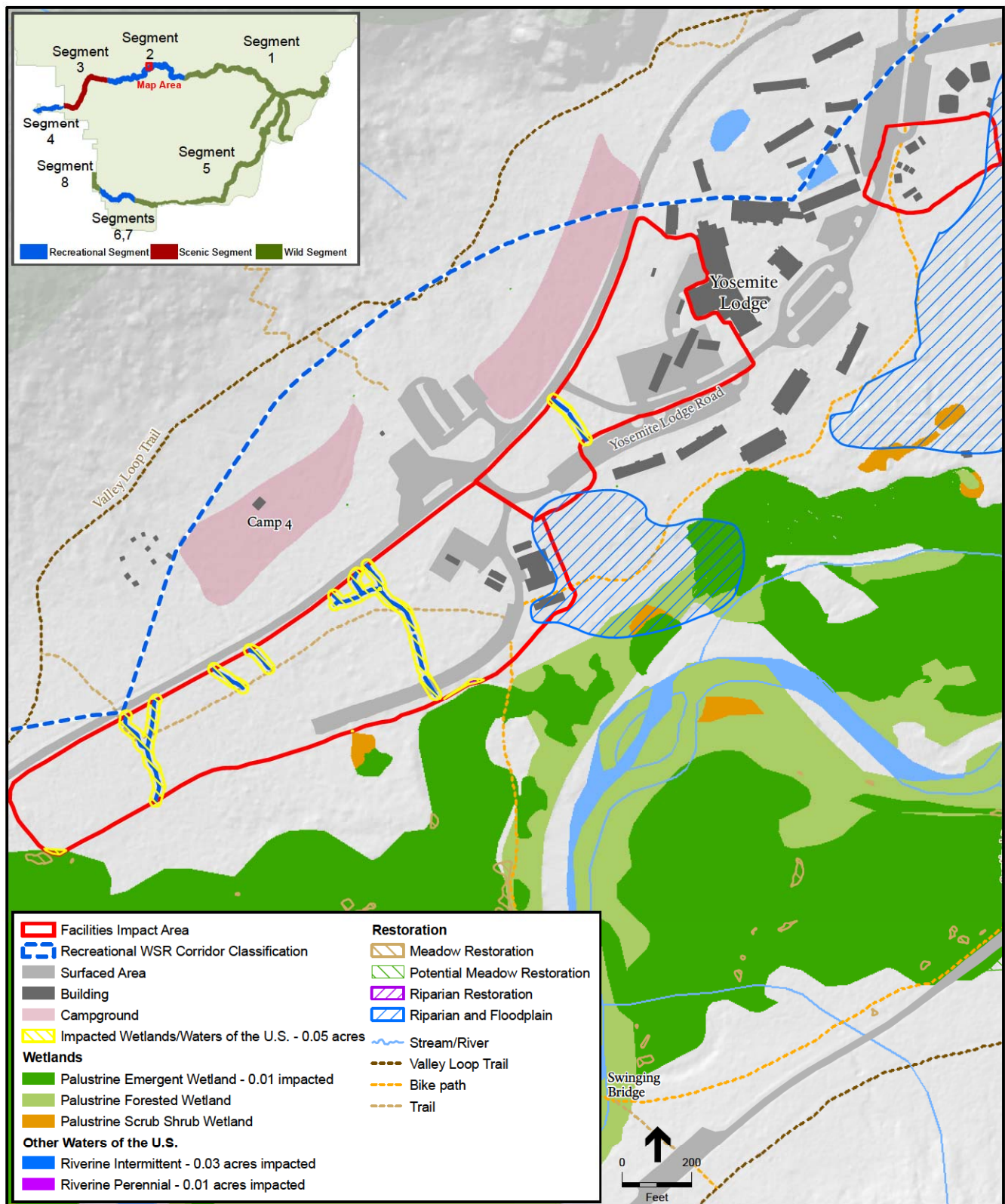


SOURCE: NPS, 1997, 2006, 2010, 2011

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**Figure O-10**

Segment 2 - Preferred Alternative Camp 6 and Yosemite Village Wetland Impacts



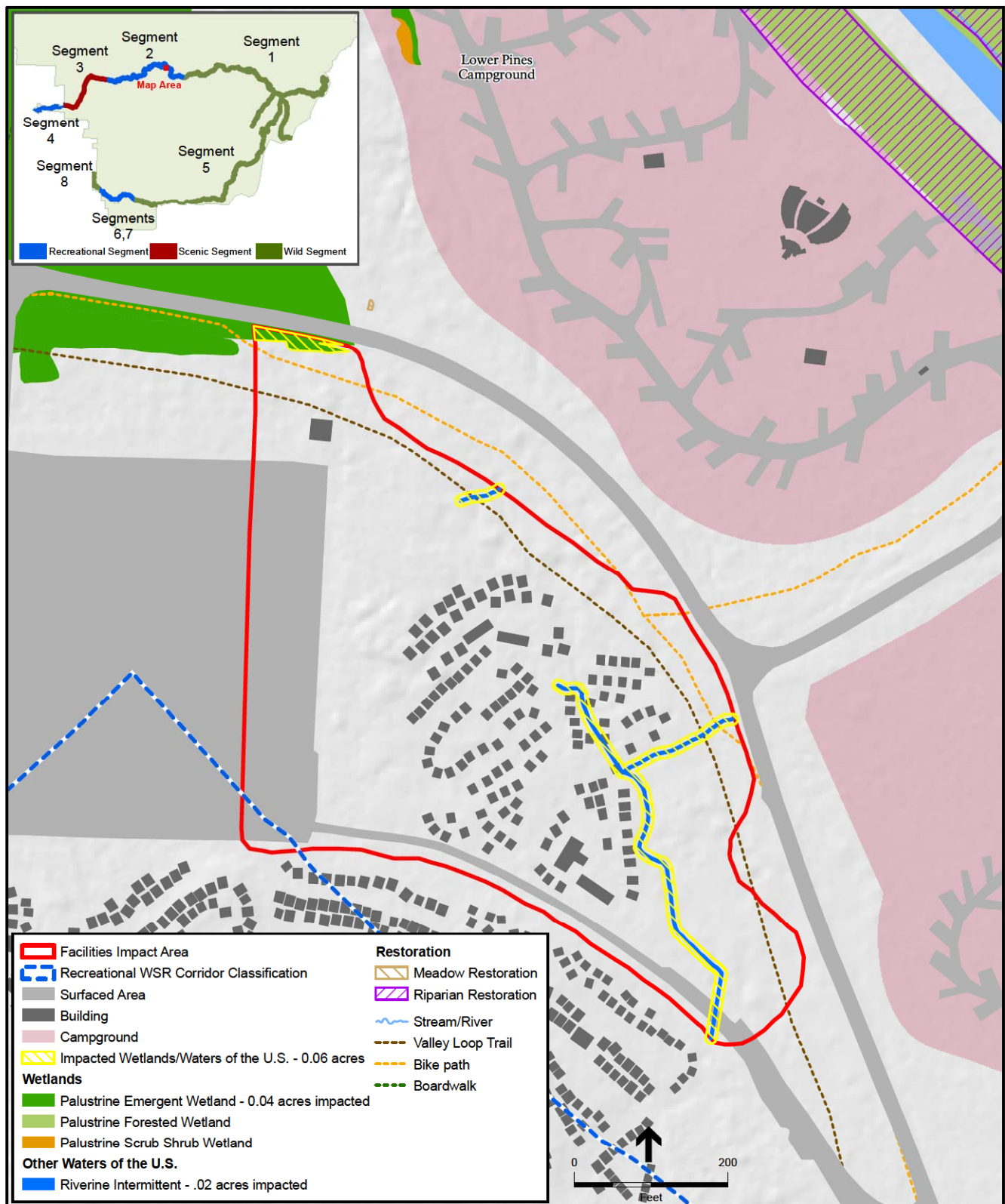
SOURCE: NPS, 1997, 2006, 2010, 2011

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**Figure O-11**

Segment 2 - Preferred Alternative  
Yosemite Lodge and Camp 4 Wetland Impacts





SOURCE: NPS, 1997, 2006, 2010, 2011

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**Figure O-12**

Segment 2 - Preferred Alternative  
Curry Village Wetland Impacts



## Restoration

Proposed restoration management actions under Alternative 5 would improve hydrologic function and restore ecological integrity of the Merced River corridor, including associated plant communities and wetlands. Management actions under Alternative 5 would result in the restoration of approximately 40.52 acres of wetlands in Segments 2 and 4, which represents a corridorwide, long-term, moderate, beneficial impacts on wetlands.

The primary components which would benefit wetlands in all segments (Segments 1-8) in the long-term include the following:

- *Removal of Abandoned Infrastructure* – Abandoned underground infrastructure would be removed that alters hydrology, including remnants of abandoned sewer treatment facilities, sewer and water lines, and manholes. This infrastructure currently contributes to dewatering of meadows and wetlands, and alteration of the natural hydrologic regime of the Merced River. Areas of removed infrastructure would be restored to natural conditions, including revegetation with native plants.
- *Restoration of Eroded and Vulnerable Riverbanks* – Areas with denuded vegetation and areas susceptible to erosion would be stabilized and revegetated with native plants. Re-vegetated areas would be protected using closure signs, fencing, and/or other natural barriers such as rocks and logs as deterrents.
- *Protection of the Riparian Zone* – The riparian zone would be protected from new development within 150' from the ordinary high water mark. Campsites within 100' feet of the ordinary high water mark would be removed or relocated.
- *Removal and Replacement of Riprap* – Riprap would be removed where possible to restore natural river processes. Riprap would be replaced with native riparian vegetation, using bioengineering techniques if riverbank stabilization is still necessary for infrastructure protection.
- *Addressing Trails in Sensitive Habitat* – Trails would be rerouted out of sensitive habitats or boardwalks would be installed through wetlands. New trail routes should avoid wetlands and special status habitat.

In Segment 1, additional actions include requiring administrative pack stock to feed on pellet feed that is packed into the site instead of allowing pack stock to graze in meadow areas. This would help protect meadow vegetation from high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits.

In Segment 2, the location of some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of Valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, fill would be removed from wetlands and sensitive areas at the Ahwahnee Meadow, boardwalks would be installed in wet areas, and culverts would be added to improve hydrologic connectivity. Stoneman Meadow would be restored by removing roadside parking and unnatural fill material, and extending fencing to protect wetlands, and the Curry Orchard parking lot would be redesigned to promote water flow from the cliff walls to Stoneman Meadow. In addition, fencing would be installed along the

northern perimeter of El Capitan Meadow and boardwalks, and viewing platforms would be installed to reduce habitat fragmentation; boardwalks would be constructed at the Valley Loop Trail as well to reduce impacts on wet meadow habitat in Slaughterhouse Meadow. These actions would collectively improve meadow and wetland habitat integrity, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats.

In Segment 4, the Greenemeyer Sandpit contains fill material that precludes natural flooding and regeneration of riparian plant communities. The Greenemeyer Sandpit would be restored to natural conditions. Fill material would be removed and the topography recontoured. Native riparian vegetation would be planted to restore the natural vegetation for the site. Abbieville and the Trailer Village contain impacts of former development, including paved roads and parking and compacted soils within 150 feet of the riverbanks. Asphalt and imported fill would be removed. The area would be recontoured and planted with native riparian species and oaks.

Overall, restoration activities have the potential to create localized, short-term, minor, adverse impacts. For example, construction activities associated with restoration management actions could result in damage to or removal of vegetation, and the potential introduction and spread of invasive nonnative species. However, restoration activities are anticipated to result in net long-term, beneficial impacts as natural ecological processes are restored.

## FUNCTIONS AND VALUES

This section describes the functions and values of the wetland types impacted under Alternative 5: Palustrine emergent wetlands, palustrine forested wetlands, riverine intermittent wetlands, and riverine perennial wetlands. The following functions and values were evaluated based on those described in Procedural Manual #77-1:

- *Biotic functions*, including fish and wildlife habitat, plant productivity, native species, habitat diversity, threatened and endangered species;
- *Hydrologic functions*, including flood attenuation, streamflow maintenance, groundwater recharge and discharge, water supply, erosion and sediment control, water purification, and detrital export to downstream systems;
- *Cultural values*, including aesthetics, education, historical values, archaeological values, recreation, and interpretation;
- *Research/scientific values*, including potential references sites for scientific research; and
- *Economic values*, including flood protection, fisheries, and tourism.

## **Palustrine Habitats**

### ***Biotic Functions***

The relatively dense layer of herbaceous vegetation in the palustrine emergent wetlands provides a variety of benefits for many wildlife species. In particular, the meadow communities provide foraging habitat for raptors and perennial range habitat for deer to bed and forage. The palustrine forested wetlands provide several benefits for wildlife species; specifically, it provides nesting and perching habitat for several species of birds, and leaf litter provides habitat for smaller animals. All the palustrine wetlands provide habitat for pollinators and other invertebrates.

### ***Hydrologic Functions***

Palustrine habitats could play an important role in flood attenuation and sediment retention. In addition, wetlands located below roads and other developed areas may serve to retain sediment and degrade nutrients before the runoff enters downstream systems.

### ***Cultural Values***

The palustrine habitats in the study area do not contain any known archaeological sites. Apparent cultural values include the significant aesthetic values that meadow and riparian wetlands provide, particularly in contrast to the steep, rocky walls of the valley. Interpretive guides and the meadow clearings that allow majestic views of the park have brought appreciation and awareness of wetlands to the millions of park visitors that have visited the area for decades.

### ***Research/Scientific Values***

Palustrine habitats, particularly emergent wetlands, provide rich opportunities for scientific research. Climate change, development, and vegetation management practices have caused changes in plant communities in the meadows. Such changes may be reflected in the floodplain sediments through charcoal debris and the pollen record, which may be amendable to scientific study.

### ***Economic Values***

For the reasons listed above, the palustrine habitats could provide significant economic value for flood protection, biological resources (in particular fisheries), and tourism.

## **Riverine Habitats**

### ***Biotic Functions***

The Merced River provides a year-round water source for wildlife and habitat for fish and aquatic invertebrates. The intermittent channels provide a seasonal water source for wildlife and invertebrates.

Because the unconsolidated shore habitats lack vegetation and usually lack water, they may not provide significant habitat or food sources for wildlife.

### ***Hydrologic Functions***

The hydrologic functions of the Merced River are flood attenuation, streamflow maintenance, water supply, erosion control, sediment retention, water purification, and detrital export (including large woody debris) to downstream systems. Additionally, because of the coarse texture of the sediments that make up the Merced River channel, riverine habitats along the Merced River could offer some degree of groundwater recharge function. The intermittent channels are periodic water sources and therefore provide less function; however, they nevertheless contribute streamflow maintenance, water supply, erosion control, sediment retention, water purification, and detrital export to downstream systems.

### ***Cultural Values***

Because Native Americans are known to have focused some activities along streams, riverine habitats may provide archaeological value. Perennial channels also provide an aesthetic value. Visitors to the park enjoy the Merced River and engage in activities such as swimming, boating, fishing, and photography. The seasonal water flow and seasonal lack of vegetation in the intermittent channels limit the aesthetic value of these habitats.

### ***Research/Scientific Values***

The riverine habitats may provide opportunities for research in groundwater-vegetation relationships and in the effectiveness of riparian habitat restoration techniques.

### ***Economic Values***

For the reasons listed above, the riverine habitats could provide significant economic value for flood protection, biological resources (in particular fisheries), and tourism.

## **JUSTIFICATION**

### **Alternatives Considered**

The range of alternatives considered in the *Merced River Plan DEIS*, presented in the “Alternatives” (Chapter 8), include the No Action Alternative (Alternative 1), Self-Reliant Visitor Experiences and Extensive Floodplain Restoration (Alternative 2), Dispersed Visitor Experiences and Extensive Riverbank Restoration (Alternative 3), Resource-based Visitor Experiences and Targeted Riverbank Restoration (Alternative 4), and Diversified Visitor Experiences and Selective Riverbank Restoration (Alternative 6).

### *Alternative 1*

Alternative 1 provides a baseline on which to compare impacts from Alternatives 2 through 6. However, with wetland impact minimization and various restoration measures included in the preferred alternative, Alternative 1 may not necessarily be less damaging overall to wetlands because it would forego numerous opportunities for restoration. Further, it does not accomplish the purpose of the project.

### *Alternative 2*

The guiding principles of Alternative 2 include maximizing the restoration of the 100-year floodplain by removing infrastructure not essential to resource-related recreation, and creating a more self-reliant visitor experience, where less commercial services are available. Visitor-use levels are managed to allow for visitor experiences free of crowding or congestion. Alternative 2 would restore up to approximately 347 acres of vegetation, including 47.97 acres of wetlands, as a result of actions common to Alternatives 2-6 and those specific to Alternative 2. Actions to manage visitor use and facilities would result in the loss of approximately 32.37 acres of vegetation and the permanent loss of 2.87 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 2. This alternative includes large-scale wetland restoration actions including removal of the road through Stoneman Meadow, removal of Northside Drive through Ahwahnee Meadow, removal of parking outside the 10-year floodplain at the Yosemite Village Day Use Parking Area, the removal of roadside parking along Yosemite Valley meadows complete closure and ecological restoration of Housekeeping Camp, and the restoration of Wawona Golf Course to meadow habitat. These actions are possible when coupled with the decrease in daily Yosemite Valley visitation proposed under Alternative 2.

### *Alternative 3*

The guiding principles of Alternative 3 include restoration of large portions of the floodplain and the riparian area within 150 feet of the river. This alternative accommodates much lower maximum visitor use levels than today, and offers fewer commercial services and facilities. Visitor use levels are managed to allow for dispersed visitor experiences free of crowding or congestion. Alternative 3 would restore approximately 302 acres of vegetation, including 46.79 acres of wetlands, as a result of actions common to Alternatives 2-6 in conjunction with actions specific to Alternative 3. Actions to manage visitor use and facilities would result in the loss of approximately 31.66 acres of vegetation and the permanent loss of 2.75 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 3. This alternative includes robust wetland restoration actions including removal of the road through Stoneman Meadow, removal of Northside Drive through Ahwahnee Meadow, removal of parking outside the 10-year floodplain at the Yosemite Village Day Use Parking Area, the removal of roadside parking along Yosemite Valley meadows and the restoration of Wawona Golf Course to meadow habitat.

### *Alternative 4*

The guiding principles of Alternative 4 include restoration of portions of the floodplain and the riparian area within 150 feet of the river. This alternative focuses on providing only those commercial services and facilities that facilitate resource-based visitor experiences. It accommodates lower maximum visitor

use levels than today, with large increase in overnight camping capacity and moderate decreases in the overnight lodging capacity. Alternative 4 would restore approximately 223 acres of vegetation, including 44.57 acres of wetlands, as a result of actions common to Alternatives 2-6 and those specific to Alternative 4. Actions to manage visitor use and facilities would result in the loss of approximately 34.57 acres of vegetation and the permanent loss of 2.67 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 4. This alternative includes targeted wetland restoration actions including removal of the road through Stoneman Meadow, removal of parking 150 feet away from the river at the Yosemite Village Day Use Parking Area, and the removal of roadside parking along Yosemite Valley meadows.

### ***Alternative 6***

The guiding principles of Alternative 6 include limited restoration within 100 feet of the river and in meadow and riparian areas, infrastructure improvements to accommodate growth in peak daily visitation in Yosemite Valley, and expansion of facilities and services to allow for diversified visitor experiences. Alternative 6 would restore approximately 170 acres of vegetation, including 37.37 acres of wetlands, as a result of actions common to Alternatives 2-6 and those specific to Alternative 6. Actions to manage visitor use and facilities would result in the loss of approximately 36.89 acres of vegetation and the permanent loss of 2.67 acres of potentially jurisdictional wetlands as a result of actions specific to Alternative 6. This alternative includes focused wetland restoration actions including removal of parking 150 feet away from the river at the Yosemite Village Day-use Parking Area and the removal of roadside parking along Yosemite Valley meadows.

## **Nonwetland Alternatives to the Proposed Action**

The *Merced River Plan/DEIS* involves comprehensive management within the Merced River corridor, which includes riverine, palustrine and lacustrine habitat. The purpose of the Merced River Plan is to provide a comprehensive management plan for the protection of the Merced River's free-flowing condition, water quality, and the values that make the river worthy of designation. There are no alternatives to the proposed action that could be located outside the floodplain or wetland and aquatic habitat of the Merced River corridor, as the plan is focused upon enhancements to aquatic habitats.

## **Design or Modifications to Minimize Harm to Wetlands**

### ***Mitigation Measures***

A full list of mitigation measures prescribed for the *Merced River Plan/DEIS* are outlined in Appendix C. Mitigation measures specific to wetland resources are summarized below. The National Park Service (and its contractors) shall implement the following mitigation measures, as appropriate, prior to, during, and/or after construction activities. Specific tasks would include, but are not limited to, the following:

## Hydrology and Water Quality

- **MM-HYD-1.** Contractor shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that designates construction best management practices to be used to control the sources of fine sediment and to capture and filter it before entering the river. The SWPPP shall define the characteristics of the site, identify the type of construction that will be occurring, and describe the practices that will be implemented to control erosion and the release of pollutants in stormwater. At a minimum, the SWPPP shall address the following, as applicable:

### *Stabilization Practices*

- The stabilization practices to be implemented shall specify the intended stabilization practices, which may include one or more of the following: temporary seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, erosion control mats, protection of trees, preservation of mature vegetation, etc. On the daily CQC Report, the Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and/or grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Unless otherwise directed by the Contracting Officer for the reasons below (i.e., unsuitable conditions or no activity for less than 21 days), stabilization practices shall be initiated as soon as practicable, in any portion of the site where construction activities have temporarily or permanently ceased, but no more than 14 calendar days after the activities cease.
- **Unsuitable Conditions** - Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.
- **No Activity for Less Than 21 Days** - Where construction activity will resume on a portion of the site within 21 days from when activities ceased (e.g., the total time period that construction activity is temporarily ceased is less than 21 days), then stabilization practices do not have to be initiated on that portion of the site by the 14th day after construction activity temporarily ceased.

### *Structural Practices*

- The Contractor shall implement structural practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Location and details of installation of structural practices shall be depicted on the construction drawings.

### *Silt Fences*

- The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations indicated on the drawings or as needed based on Contractor operations. Final removal of silt fence barriers shall be upon approval by the Contracting Officer.

- Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6-inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the COR.

#### ***Straw Bales***

- Straw bales are not authorized for use in storm water control in Yosemite National Park as they have the potential to introduce exotic species into the Park environment.

#### ***Diversion Dikes***

- Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic. Diversion dikes shall be located as shown on the drawings or as needed based on Contractor operations. Location of diversion dikes shall be fully coordinated with cultural and natural environmental protection requirements described in Section 01355, Natural, Cultural, and Physical Resources Protection.

#### ***Filter Fabric***

- The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments that are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:

##### **FILTER FABRIC FOR SILT SCREEN FENCE**

<u>Physical Property</u>	<u>Test Procedure</u>	<u>Strength Requirement</u>
Grab Tensile	ASTM D 4632	100 lbs. min.
Elongation (%)		30 % max.
Trapezoid Tear	ASTM D 4533	55 lbs. min.
Permittivity	ASTM D 4491	0.2 sec <sup>-1</sup>
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

#### ***Silt Fence Stakes and Posts***

- The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when hardwood is used and 4 inches by 4 inches when softwood is used, and shall have a minimum length of 5 feet. Steel posts (standard "U" or "T" section)



utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

#### **Identification Storage and Handling**

- Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873.

#### ***Maintenance***

- The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.
- Silt fences shall be inspected in accordance with the below paragraph, Inspections. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed with approval of COR. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade.
- Diversion dikes shall be inspected in accordance with the below paragraph, Inspections. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade.

#### ***Inspections***

- The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every 7 calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.
- Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.
- For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the COR within 24 hours of the inspection as a part of the Contractor's daily CQC Report. A copy of the inspection report shall be maintained on the job site.

## **Wetlands**

- **MM-VEG-4.** Delineate wetlands and apply protection measures during construction. Wetlands shall be delineated by qualified National Park Service staff or certified wetland specialists and clearly marked prior to work. Perform activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.
- **MM-VEG-5.** The Contractor shall adhere at all times to the conditions of U.S. Army Corps of Engineers Nationwide Permit No. 33, Temporary Construction, Access and Dewatering, with the following conditions as a minimum:
  - All work will be subject to the Standard and Technical Conditions of the Certification of the California Regional Water Quality Control Board, a copy which will be provided to the Contractor.
  - Work in streambeds is to be performed in periods of low water conditions. Contractor shall monitor stream flow conditions and weather forecasts at all times during the course of the work. During thunderstorms or other intense rain conditions, streambeds at Yosemite can fill rapidly.
  - Re-grade and restore disturbed areas to preexisting contours to maintain drainage patterns.
- **MM-VEG-6.** The Contractor shall fence construction areas adjacent to aquatic habitats to prohibit the movement of aquatic species into the construction area and to control siltation and disturbance in aquatic habitats.
  - The Contractor shall salvage and reuse wetland soils as fill to the maximum extent possible.
  - The Contractor shall use trench plugs where designated on the drawings in wetland areas to prevent changes to natural flow patterns.
  - During dewatering, intakes shall be completely screened with wire mesh not larger than 5 millimeters to prevent aquatic species from entering the pump system. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction.
  - Access routes to and through work locations in the meadows and wetlands shall be planked with 1 1/8" plywood, stabilization mats or other method approved by the contracting officer.

Refer to Appendix C of the *Merced River Plan/ DEIS* for a complete list of resource-specific mitigation measures applicable to the preferred alternative. The Preferred Alternative has been designed to mitigate harmful effects to wetlands. The Merced River Plan/DEIS includes programmatic actions that will require preparation of a subsequent statement of findings for specific projects.

## ***Site Restoration***

Restoration of riverine habitat functions and values is an integral part of the preferred alternative in Segments 1-8 of the Merced River corridor. Restoration of 40.52 acres of wetland habitat would improve palustrine habitat functions and values in Segments 2 and 4. Additional restoration activities that are

incorporated into the preferred alternative are described above, under the subheading *Environmental Consequences of the Proposed Action on Wetlands*.

### ***Proposed Compensation***

The emphasis of the Merced River Plan is to avoid and minimize impacts to wetland resources. Approximately 2.67 acres of wetlands would be impacted by Alternative 5, including 1.26 acres of palustrine emergent wetlands, 0.96 acres of palustrine forested wetlands, 0.44 of riverine intermittent wetlands, and 0.01 acres of riverine perennial wetlands. Compensation will be required for the direct impact to 2.67 acres of wetlands at Curry Village, Camp 6 and Yosemite Village, and Yosemite Lodge and Camp 4. The wetland features that would be affected by the proposed activities provide important natural functions such as nutrient cycling, sediment entrapment, and habitat for wildlife. Because this project must ensure “no net loss” of wetland functions or values, compensation of a minimum of 2.67 acres of wetland would be required.

The NPS will provide compensation through the restoration of approximately 40.37 acres of wetlands in Segment 2 (see Figures 9-29 through 9-32 in Chapter 9). Figures O-9 through O-12 display the locations of proposed actions to restore and enhance wetland habitats in areas near where wetland impacts will occur. These restoration actions will provide compensation for the wetland losses described above, resulting in a 15:1 habitat compensation ratio. Restored wetland types include palustrine forested wetland and palustrine emergent wetland. Restored areas will provide equivalent, if not higher, wetland functions and values to those features impacted by the project. In general, in-kind mitigation is preferable to out-of-kind mitigation because it is most likely to compensate for the functions and values lost at the impact site. However, in the case of the impacted riverine wetlands (where the impacts are much less than those to the palustrine wetlands), this habitat type is already abundant in the region and a priority was placed on creating additional palustrine emergent and forested wetlands, as this habitat type would adequately compensate for the lost functions and values of the riverine wetlands.

## **CONCLUSION**

The proposed action would have a beneficial impact on the extent, function, and value of wetlands by implementing restoration management actions for the Merced River corridor. These management actions would include the removal of abandoned infrastructure, restoration of eroded and vulnerable riverbanks, protection of the riparian zone within 150' of the ordinary high water mark, removal of campsites within 100' of the ordinary high water mark, removal and replacement of riprap, and the rerouting of trails from sensitive habitat, including wetlands. The removal of fill from wetland and riparian areas would result in the net creation of wetlands within Segments 2 and 4. The net result of these actions would be improved hydrologic function and the restoration of ecological integrity of the Merced River, including associated plant communities and wetlands.

Approximately 2.67 acres of wetlands will be impacted by implementation of Alternative 5, including 1.26 acres of palustrine emergent wetlands, 0.96 acres of palustrine forested wetlands, 0.44 of riverine

intermittent wetlands, and 0.01 acres of riverine perennial wetlands. The NPS will provide compensation through the restoration of approximately 40.37 acres of wetlands in Segment 2

The National Park Service has determined that there is no practicable alternative that could be located outside the floodplain or wetland habitat. Mitigation and compliance with regulations and policies to prevent impacts to water quality, wetland function and values, and loss of property or human life would be strictly adhered to during and after construction.

Subsequent project-level documentation may be required for future development projects. Individual permits with other federal and cooperating state and local agencies will be obtained or updated as appropriate prior to any development activities. Therefore, the National Park Service finds the proposed action to be acceptable under Executive Order 11990 for the protection of wetlands.

Recommended:

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Superintendent, Yosemite National Park

Date

Certification of Technical Adequacy and Servicewide Consistency:

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Chief Water Resources Division  
or Professional Wetland Scientist, National Park Service

Date

Approved:

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Regional Director Pacific West Region, National Park Service

Date